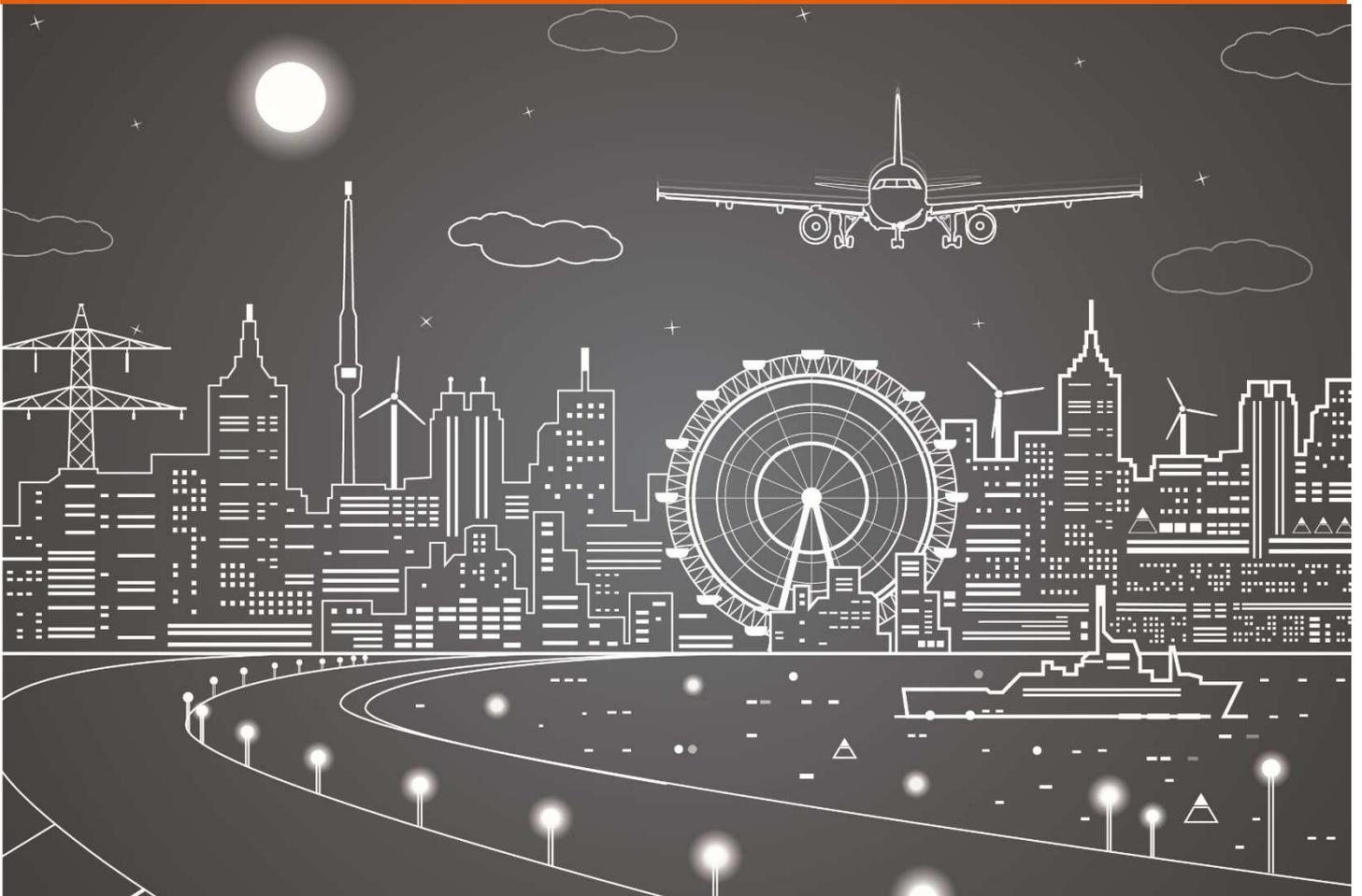


NATIONAL INFRASTRUCTURE COMMISSION

Call for Evidence

London's Transport Infrastructure

JANUARY 2016



Incorporating

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On the 13th November 2015, the National Infrastructure Commission published a Call for Evidence with respect to three core themes:

- 1. Connecting Northern Cities**
- 2. London's Transport Infrastructure**
- 3. Electricity Interconnection and storage**

This paper comprises the response of Arcadis UK to the second of those themes, **London's Transport Infrastructure.**

Introduction

Whilst we absolutely understand the desire of the Commission to seek responses that are grounded in evidence and data, the overall vision and strategy for London is exciting and will undoubtedly lead to a step change in infrastructure and therefore economic outcomes, there is a concern that existing approaches to investment appraisal will lead to sub optimal outcomes.

Therefore, we have taken an approach that seeks to provide some guidance to overcome some of these challenges by referring to our experience in other countries, and looked at the strategic question of how to value the benefits of the various competing investment interventions and how to prioritise them in what will inevitably be a constrained funding environment.

We look forward to discussing this submission with the Commission in due course and expanding on both the themes and Case Studies contained within it, and to providing any additional information and analysis from the rich library of other case studies developed by Arcadis.

Question 1 – What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

London is home to 8.6 million people, is projected to grow to 10 million by 2030 and, assuming trend rates of economic growth continue, become a city of over 11 million by 2050. London competes on a global stage as one of the greatest cities on earth and if it (and the UK) is to continue to deliver, the benefits that flow from this status it needs to maintain its competitive advantage. Yet London is suffering from an acute shortage of affordable housing (200,000 additional units by 2030), education (600 new schools by 2050) and healthcare, and together with congestion and its aging infrastructure, means the city is becoming an increasingly less attractive place to live and work.

Attracting and retaining the talent required to maintain London's competitive advantage would depend on the ability to improve the quality of life for Londoners (and its hinterland). Managing the impact of climate change and changing the behaviours around public consumption of (what are now regarded as) basic human needs such as electricity, gas, water, and now data, are critical to the next generation and delivering a more sustainable environment.

This pace of change brings into question London's ability to fund this growth and ambition. Current funding models will not always be flexible enough to meet the demands of the city, and the ability for London and the surrounding hinterland to work together and be more flexible and agile; will be critical to its success. London's Infrastructure Plan alone calls for around £1.3trn of required investment through to 2050 to satisfy this demand.

London has extremes of wealth, with the very wealthy central London and the whole western corridor out to the Thames Valley self-evident. What is less obvious is that London also has some of the most deprived areas of poverty in the country. Rebalancing and redistributing some of London's wealth creation along its North/South axis and eastern corridor are real opportunities to address shortfalls in housing and employment to stimulate wider economic and social benefit.

Question 2 – What are the strategic options for future investment in large-scale transport infrastructure improvements in London – on road, rail and underground – including, but not limited to Crossrail 2

The strategic options should be driven by the need to both rebalance London's economy as well as address London's wider growth agenda. This growth agenda is likely to result in the need for extra capacity on key corridors to alleviate congestion as well as improve journey times for all modes.

These strategic options should also be assessed using an appraisal framework that takes full account of the additional agglomeration benefits that would be derived from creating a faster, more frequent and more integrated London regional transport network. Whilst individual projects such as Crossrail 2 will undoubtedly have a significant impact, the wider network effects ought to be greater than the sum of the parts.

For example, traditional project appraisal would tend to look at the business cases for projects such as Crossrail 2, Bakerloo Line Extension and the Overground to Barking in isolation. However, couple this with the potential investment by Network Rail to upgrade the West Anglian line into Liverpool Street to four tracks, and then both put into the wider regeneration context of accelerating growth to the opportunity areas of Upper Lea Valley and North Bexley. The result is the creation of vibrant and dynamic wider economic zones forming a Northern corridor from London to the knowledge economy powerhouse of Cambridge, including the international transport hub of Stansted Airport.

A similar approach could be used to connect the South Coast upgrade into Victoria Station via Croydon create another linear economic zone including another international transit hub at Gatwick Airport. Indeed, whilst Arcadis understands the NIC has not asked for responses on Aviation capacity, we do feel justified in pointing out these additional benefits bought by the wider connectivity along a North/South axis for London and the surrounding hinterland. Additional runways can be built at all of Gatwick, Stansted and Birmingham (leveraging HS2 links) airports for the same level of investment as required by a single third runway at Heathrow, and would deliver similar economic gains.

Arcadis has used this approach to create models that maximise social and economic benefits for transportation links in other countries such as Asia and North America, and would be happy to share these with The Commission.

Of course, London and its hinterland is not a homogenous region. Whilst economic zones of considerable size could be created (such as The City, through the Lea Valley and then to Cambridge via Stansted), the needs of the citizens in this region will be very different to those in other parts of London and the South East. Given the fact that funding is always more constrained than would be ideal, choices have to be made and that means determining priorities. Sometimes those choices will have to be made taking account of qualitative as well as quantitative factors.

Arcadis has therefore developed a framework that enables policy makers to prioritise these strategic choices.

Prioritisation Framework

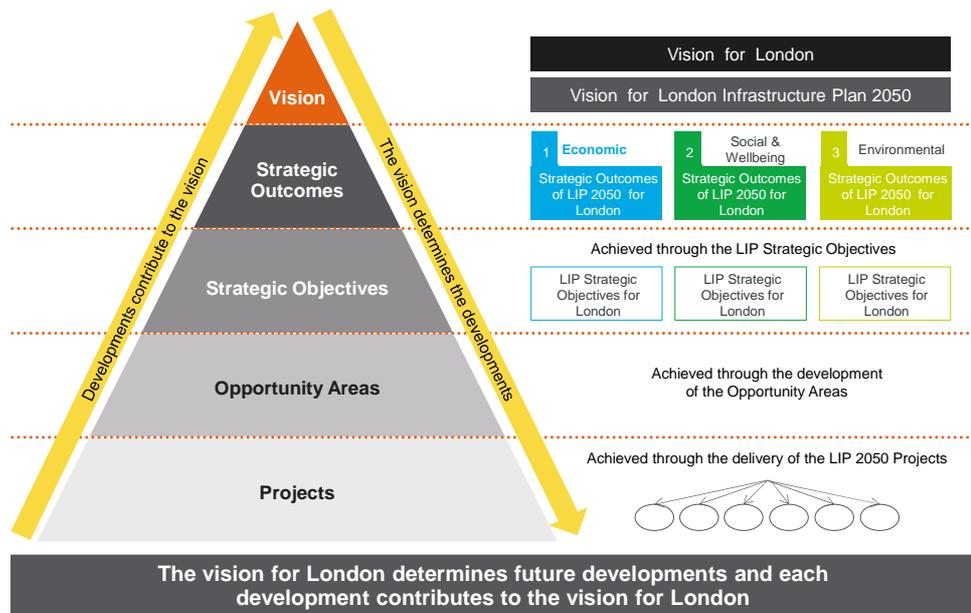
The establishment of a comprehensive appraisal framework that gives relevant weighting on a project-by-project basis and with appropriate local and regional context to:

- Direct User Benefits;
- Productivity Benefits;
- Investment and Employment Benefits;
- Changes in Land Use Planning.

will result in a more rounded approach to project appraisal.

A prioritisation framework is needed that takes account of factors that cannot always be easily quantified. Arcadis has experience of developing such a framework in London where the needs and agenda of the various Boroughs and Regions are often not aligned either economically or even politically, even though they all still see the benefit of functioning as a wider City Region. Below is an illustration of how the model works;

Prioritisation Framework Principles



A series of KPI's are developed for each of the strategic objectives that flow through to the Opportunity Areas to ensure the benefits are delivered over lifetime of the investment plan. These include employment, productivity and housing supply.

Question 3 – What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Having identified in Question 2 the benefits to be derived from a more integrated network that seeks to address both the needs to support the growth in London's wider economy as well as rebalance it, the question for Crossrail 2 is will the route currently being proposed support these objectives as much as it could do?

The criteria for assessing benefits needs to be broader than might traditionally have been the case. For example, is it correct that the benefit assessment for every station should be limited to a 1km radius from the station when the demographics for each are different? The private sector will always maximise their investment opportunity in a way the current appraisal model does not properly capture, particularly for densification and infill. Crossrail 2 will need to think and act more like a developer who runs rail networks, a good example of this approach being MTR in Hong Kong. London is a city with high land values with a growing population, and these land values could be sustained along the entire line of route with the right approach.

Arcadis have developed a model that assesses the wider social and economic benefits beyond the conventional scheme appraisal and this is set out in the case study below.

CASE STUDY – INTERNATIONAL RAIL PROJECT

Arcadis was commissioned by the Government of a major and rapidly developing country to undertake a socio-economic impact assessment study for a transformational investment in high-speed rail infrastructure. Having studied available literature and ex-post assessments of the economic benefits of High Speed Rail (the number and quality of such studies being still limited), Arcadis developed a new methodology to the ex-ante assessment of the economic benefits of High Speed Rail – the Socio Economic Development Plan.

The methodology assumes that rather than simply build the infrastructure and assume the private sector will respond to the availability of infrastructure by investing (which to an extent they will), a more accelerated and optimised approach to stimulating economic growth would come from a structured and proactive approach on the part of Government, whether national, regional or local. By assessing local physical, social and economic opportunities and aligning them to the broader economic and industrial strategy of the Government, we were able to identify for each of the principal economic centres on the line route, the industry clusters most likely to benefit from the introduction of a High Speed Railway and contribute the most to Agglomeration effects.

The opportunities identified through this process included:

- Physical Development – Integrated and Planned Land Use.
- Socio- Economic Development – Regeneration of key centres as well as improved mobility / development of talent.
- Business Opportunities – dramatic acceleration of the growth of emerging industry clusters (many in advanced and emerging technologies) through links to new customers and markets.
- Monetisation Opportunities – Land value increases generally as well as specific development opportunities at transportation hubs.

Overall, we determined that this approach could support a doubling of GDP compared to the current forecast for the same corridor over the next half century. Whilst the project was undertaken in a country with different socio—economic characteristics than the Northern Powerhouse region as well as being in a very different phase of economic and industrial maturity, the approach adopted in terms of planned interventions to maximise the Agglomeration benefits from major transport infrastructure has many similarities worth evaluating.

The influence of Crossrail 2 on regional networks should not be discounted either as 6-8 train paths per hour will be freed up into Liverpool Street and Victoria stations. Along the New Southgate branch a connection to Network Rail at Seven Sisters should be made.

In terms of cost reduction opportunities, in assessing whether the current route is in fact the right one, Arcadis believe you could omit King Road station (£600m saving) and with the Piccadilly Line upgrades being undertaken this calls into question the rationale for the New Southgate branch.

Question 4 – What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

The London Finance Commission has outlined its approach for funding London's infrastructure, largely based on keeping a greater share of the tax receipts generated by the city. Whilst this is a model that should be considered, Arcadis believe approaches are valid and possibly, in a hybrid form i.e. parts of different models used in tandem.

One of the challenges is to use models that are understood by lenders and investors and the risk profile can be managed. Some options for further consideration should be;

- For large one-off projects, the funding model used for Thames Tideway Tunnel and creating a separate Regulated Asset Base (RAB) has its place.
- London should utilize its asset base to create a balance Sheet approach. This would allow access to borrowing that is currently not available and is how the private sector would operate.
- Creating 'London Bonds' that finance a portfolio of projects and/or areas of regeneration.
- PPP – a model that has a poor reputation in the UK but commonplace in Europe and the United States.
- Community Infrastructure Levies (CIL's).
- Tax Increment Finance (TIF).

What the above illustrates is there are already a number of tried and tested models that should not limit London's ability to invest in its infrastructure. The finance is available. What is required are the conditions to invest i.e. stable policies.

Question 5 – How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied to London?

Arcadis has considerable experience of responding to similar challenges in cities in other countries. We have set out below one such case study in New York City that could be applied to London.

New York City will use the Lower Manhattan Resiliency Project (aka The Big U) to strengthen social and economic resiliency in climate-vulnerable communities, and to enhance the City's coastal defences in response to the evolving risks associated with climate change and other 21st century threats.

Lower Manhattan and its residents remain vulnerable to the impacts of climate change and sea level rise. The City's project, "**Protect and Connect**," will integrate physical and social resiliency into the diverse communities of Lower Manhattan through the implementation of physical projects, programmes, and policies. This will provide integrated flood protection to maintain the social and economic viability of neighbourhoods, and invest in resilient affordable housing by adapting building systems and neighbourhood infrastructure to protect homes from climate stressors. (see link

http://www.nycedc.com/sites/default/files/filemanager/Projects/Seaport_City/Southern_Manhattan_Coastal_Protection_Study_-_Evaluating_the_Feasibility_of_a_Multi-Purpose_Levee.pdf)

The funding vehicle was a Multi-Purpose Levee (MPL) which;

- Enhanced flood protection for Southern Manhattan.
- Resiliency programme funding source (i.e., the ability to self-finance and/or generate surplus revenue to fund other resiliency efforts); and
- Economic and community development (i.e., new economic activity, affordable housing, and open space; integration with Southern Manhattan's urban fabric and character).

The private sector developer revenues were projected from two sources;

1. The phased disposition of the rights to create new residential (market rate and affordable), office, retail, and hotel development on the MPL, in accordance with certain space absorption estimates; and
2. Ongoing property tax or equivalent payments in lieu of taxes ("PILOT") from new buildings on the MPL.

Revenues from development rights were estimated by modelling hypothetical vertical development cash flows for each of the uses described above and solving for the amount private developers would be willing to pay per square foot for the right to build each product type. These "residual" values per square foot were multiplied by the projected development programme for each development parcel to determine the revenue generation potential of each parcel in each of the different flood protection options under review. Payments for development rights were assumed to consist of a ground lease, structured as either a lump sum payment or a stream of future cash flows (the latter were calibrated to equal a lump sum payment in net present value terms).

The ground lease was assumed to generate a modest reduction in the value of development rights compared to land sale, which is consistent with observed conditions at other local sites subject to a ground lease such as Battery Park City.

This Feasibility Study's financial analysis relies on a number of assumptions relating to rents, operating expenses, property taxes, tax incentives, tenant improvements and leasing commissions for commercial uses, exit sales for income-generating uses, as well as sale prices for condominiums. These assumptions are based on historic data for Southern Manhattan's neighbourhoods, as well as reasonable projections of future conditions. Residential development on the MPL was assumed to be 20% affordable housing and 80% market rate housing.

In addition to the revenues generated through development rights, this Feasibility Study examined the revenues from property taxes or PILOT. The NYC Department of Finance provides detailed estimates of property taxes per square foot, by use and neighbourhood, in its "FY 2014 Guidelines for Properties Valued Based on the Income Approach, Including Office Buildings, Retail, Garages, Hotels, and Residential Properties." The Financial Feasibility analysis projects annual property tax revenues for each new development parcel on the MPL based on these estimates, which are weighted to reflect the breakout of each use on each such parcel.

Project costs can be financed with a range of different options. Depending on the magnitude of those costs, the availability of funds, and the preferences of decision makers, project costs could be financed:

- Directly through City, state and/or federal government capital budgets (and those of their component entities).
- With revenue bonds tied to on-site development proceeds and PILOT, with or without a public sector guarantee.
- By a private master developer in exchange for the right to develop on newly created parcels; or
- By a hybrid of these options.

Given the magnitude of potential MPL project costs and the range of potential new development on the different MPL typologies, a private master developer is unlikely to independently finance all project costs, even in exchange for the right to all project revenues. At the same time, given the constrained budgets of the City, state and federal governments, public capital grants would likely not be available to cover more than a portion of project costs.

The Feasibility Study assumes that a future MPL project would largely be funded with a combination of General Obligation bonds and revenue bonds. The latter requires public credit enhancement and/or debt service support, at least in the earliest phases of the project (i.e., before a critical mass of revenue-generating uses is completed). Therefore, to compare future costs and revenues, the financial feasibility analysis applies a discount rate associated with publicly supported infrastructure projects.

Project Financing Structures

The magnitude of project costs, as well as the potentially long gap between the beginning of MPL construction and the first deliveries of revenue-generating uses, suggests that a future MPL project may require some upfront public support to cover infrastructure costs. Depending on the option selected and a range of future decisions by policy makers, this public support requirement may vary. For example, a project with a higher affordable housing requirement or lower density would generate lower

revenues and could require a greater financial role for the public sector. This public sector role could include:

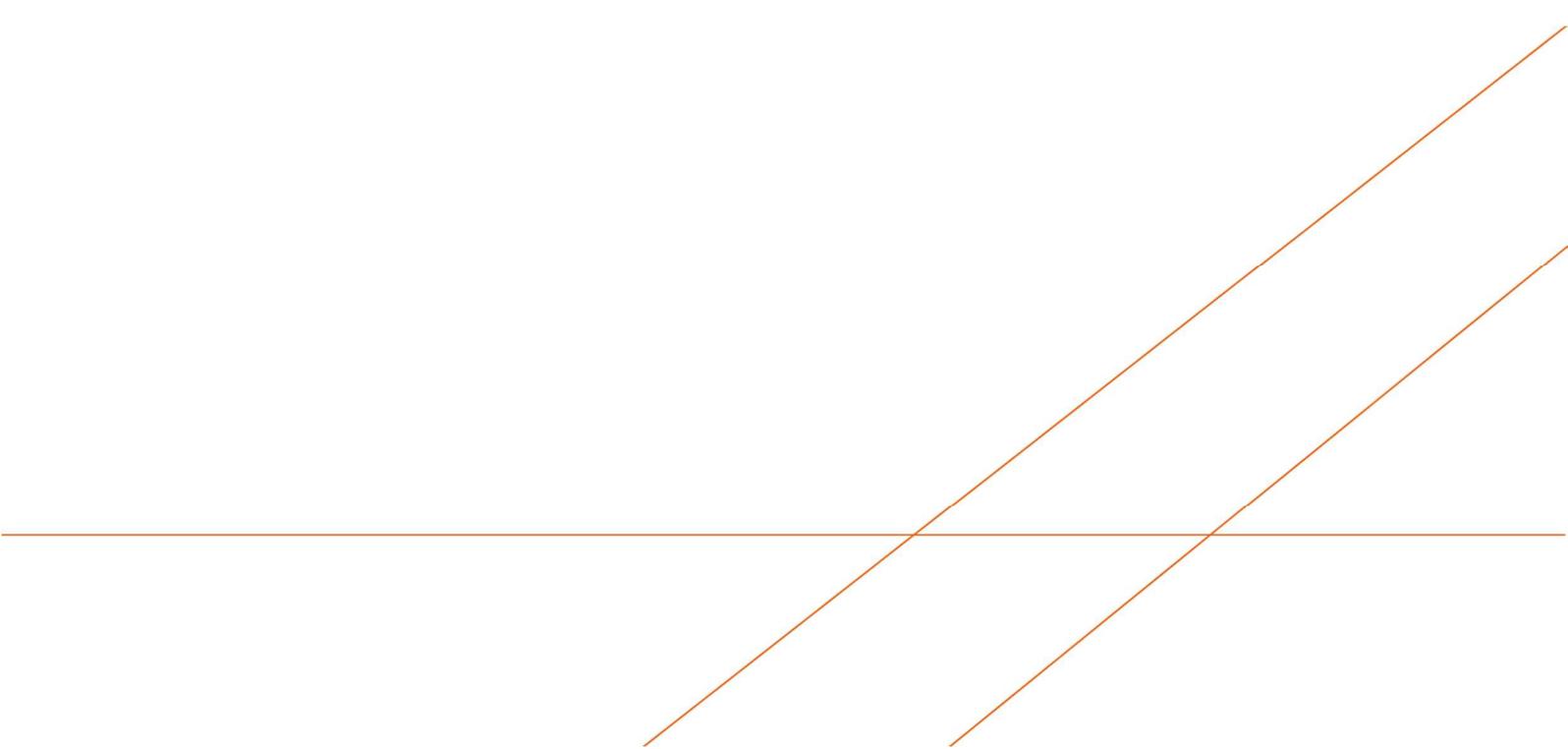
- Credit enhancement for initial bond issues, likely a requirement given the perception of risk during the early years of a new project.
- Debt service support prior to the completion of revenue-generating uses in order to minimize capitalized interest costs; and
- Capital grants from federal, state or City agencies to cover certain upfront costs as available.
- Project revenues, consisting largely of land sale or ground-lease payments and PILOT or property tax payments, would become substantial as the project is built out. Over time, these revenues could cover all required interest payments and pay down outstanding principal on infrastructure bonds. The time required to retire infrastructure bonds would depend on the degree of upfront public capital support and the degree to which capitalised interest can be avoided prior to the completion of revenue-generating uses.

The lesson for London is simply that there are proven funding models for the public and private sectors to work together, all it takes is political will.

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8 January 2016

Dear Sir/Madam

NIC Consultation – London’s Transport Infrastructure

For this topic area, we have not attempted to answer each question as set, however, we would hope it may be helpful to contribute some remarks that might inform the process and suggest a direction toward future lines of enquiry.

London’s Transport Infrastructure

London is a “world city”. It is a leading financial and commercial sector, hosting many of the world’s leading banks and corporations. It is a global hub for professional, legal, accounting, consultancy, and media related services. It is home to world-class research and development in numerous fields supported by a thriving academic network. And London is a global cultural centre, boasting world-class museums, galleries, theatres and night life.

In short, it is a thriving 24/7 metropolis that ranks among the most desirable locations to live and work in the world.

Much of that success is built on major infrastructure projects delivered successfully over the city’s history from Bazalgette’s sewers to the Jubilee Line Extension. Yet there is no room for complacency. As globalisation takes hold, there has never been a more pressing need to prepare for the future and ensure the Capital is fully equipped to compete in the new global marketplace, while providing for the domestic needs of its citizens.

With the capital’s population growing faster than homes, jobs and infrastructure can keep pace with, the case for strategic infrastructure investment is pronounced. London’s population is expected to increase from the current 8.6 million to more than 10 million by 2030 and reach a staggering 11.3 million by 2050. This prompts the obvious question ‘where will everyone live and work?’

Not only that, but London is also a major generator of wealth within the UK, so it is critical that London retains its pre-eminent role as an engine of growth for UK plc, as well as providing a roadmap for progress in other cities around the country.

London must remain competitive and it must remain an attractive place to live and work. Not just for the mobile global citizens contributing to the city's growth, but also for the many millions of Londoners who provide the critical lifeblood of the city. As such, London has to provide the hard and soft infrastructure needed to meet the needs of everyone.

To do so means supporting thriving commercial hubs alongside varied and affordable housing, as well as delivering accessible social infrastructure linked by seamless and effective, integrated transport systems.

Infrastructure investment in London can therefore no longer be a series of speculative thoughts about what could be delivered in the future. Rather it must deliver a comprehensive series of packages to drive growth and demonstrate to investors that London can and will stay ahead of the curve.

London's strong performance can support the infrastructure investment required in the North and elsewhere. However, the purse strings cannot simply sit within public sector coffers. A new system of funding and de-risking projects needs to be explored in partnership with the commercial sector. Options for new financial vehicles and delivery arrangements akin to some of the successful projects delivered in recent years across the USA and Asia should be carefully examined as part of the Commission's process to find appropriate and new financial solutions.

The transport element here provides a major challenge for London. Not only is much of London's existing transport network over 100 years old, it is operating at a capacity level way beyond that envisaged by the original design. As a result, London's road and rail networks require a high level of maintenance to operate at these levels.

Under-investment in this area would represent a clear brake on the city's prospects for development and growth. Equally a massive shortage of affordable housing, especially adjacent to good transport facilities, represents a potential curb on future development and the city's global status.

There are a number of potential schemes which address some of the issues and should certainly feature on the core list of priorities including the Upper and Lower Lee Valley, Barking Peninsula, Old Oak Common, Ebbsfleet and other areas of South London. Additionally, there is a need to investigate the multiple value outcomes of future infrastructure which includes flooding, landscape, development value, and transport with multiple outcomes which should be acknowledged earlier on in the cost benefit analysis of projects.

A particular project that Arup considers fundamental to the infrastructure investment plan in London is Crossrail 2. It needs to deliver an ambitious scheme which links the fortunes of highly productive parts of London, with other areas of latent potential. Yet, we also consider an approach should be taken where Crossrail 2 has a focus on orbital connectivity so that we do not see 'all roads leading to the CAZ and major employment areas', but instead to capitalise on the opportunity to develop successful growth nodes in outer parts of the capital.

Analysis points to the need to improve orbital connectivity around London and we think can be delivered incrementally with less burden on financial resources. The case is particularly strong when looking to areas with latent potential to deliver housing and employment clusters. Moreover, links to strategic growth corridors stretching out of

London to places like Cambridge, Gatwick and Brighton provide a growth story greater than the sum of its parts.

Looking to these examples, it is the ability to deliver jobs and homes which drives the choices for the route, rather than the route dictating the growth. In the instance of connecting Wimbledon to Croydon, a whole new corridor for connectivity could drive investment and jobs to supplement the growth of CAZ with new opportunities for complimentary growth corridors.

A link from Purley to Gatwick that takes in a link to Crossrail at Heathrow also provides for a series of employment and housing opportunities that will be lost with a radial route straight through the centre of London.

Our proposal is to consider a 'star and cluster' approach to London's growth which improves connections in these areas, with targeted regeneration investment alongside to transform the places which need it most, including Croydon, Barking and the Upper Lee Valley.

The challenge for the NIC will be to decide which projects are the easiest to fund; which offer the maximum potential for development; and which provide the greatest capacity and resilience gain for the network as a whole. It is undoubtedly a challenging prospect, but one that will be made easier with the advent of the NIC and a chance to develop a truly long-term view of how the UK should meet the needs of the Capital.

Arup stands ready to support the work of the NIC in the months and years ahead to make this initiative a success for the benefit of both London and the UK as a whole.

Yours faithfully

James Kenny
Head of Global Affairs, Arup

ACE Evidence: London's Transport Infrastructure

ACE response to the:

National Infrastructure Commission Call for Evidence

8 January 2016

About ACE

As the leading business association in the sector, ACE represents the interests of professional consultancy and engineering companies large and small in the UK. Many of our member companies have gained international recognition and acclaim and employ over 250,000 staff worldwide.

ACE members are at the heart of delivering, maintaining and upgrading our buildings, structures and infrastructure. They provide specialist services to a diverse range of sectors including water, transportation, housing and energy.

The ACE membership acts as the bridge between consultants, engineers and the wider construction sector who make an estimated contribution of £15bn to the nation's economy with the wider construction market contributing a further £90bn.

ACE's powerful representation and lobbying to government, major clients, the media and other key stakeholders, enables it to promote the critical contribution that engineers and consultants make to the nation's developing infrastructure.

Through our publications, market intelligence, events and networking, business guidance and personal contact, we provide a cohesive approach and direction for our members and the wider industry. In recognising the dynamics of our industry, we support and encourage our members in all aspects of their business, helping them to optimise performance and embrace opportunity.

Our fundamental purposes are to promote the worth of our industry and to give voice to our members. We do so with passion and vision, support and commitment, integrity and professionalism.

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Q1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

The story of London over the past twenty is one of success, a story that has seen the capital move from a declining, unattractive place, to one where people want to come and live and work, and in which companies wish to invest. The cities transport networks have, understandably, come under increased pressure due to this trend, and could be a significant hindrance to growth in the coming years.

In 2015, the capital's population reached 8.6 million people, surpassing the previous peak seen in 1939. The GLA's London Infrastructure Plan 2050 estimates that London's population is likely to rise by around 37 per cent to 11.3 million by the middle of this century. The higher end estimate suggests it could go as high as 13.4 million, however.¹ This growth equates to roughly two tube trains per week!

In addition, estimates suggest that there will be an additional 1.4 million jobs in London by 2050, an annual increase of 0.71 per cent, with two-thirds of these expected to be located in the inner-city boroughs. On top of this, there will be increases in visitor numbers, with the best estimates being that by 2022 around 21 million tourists will come, an increase of 40 per cent in the decade since 2012.²

In addition, and although outside the remit of the National Infrastructure Commission's terms of reference, an increase in visitor numbers will see added pressure on London's air connections. Further capacity will be required, as will the connections and ability to move passengers on the transport links to and from wherever this is provided.

All of this means there are obviously significant implications for demand, with Transport for London estimates suggesting that it will increase by up to 50 per cent, with traffic on the Underground and rail networks rising by 60 and 80 per cent, respectively.³

This will all occur in the context of increasing economic, financial, and fiscal devolution as central government continues to reduce the amount of subsidy from Whitehall to ensure the elimination of the UK's deficit. Future mayoral administrations must therefore ensure the capital must develop its own innovative funding mechanisms for the operation of Transport for London (TfL), with the aim of delivering a cost effective service for London's residents.

¹ *London Infrastructure Plan 2050 A Consultation* (2014), Greater London Authority, p. 7

² *Ibid*, p. 8

³ *Ibid*, p. 9

Q2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

- How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?
- What might their potential impact be on employment, productivity and housing supply in London and the southeast?

The needs of London in terms of its transport infrastructure, fall into roughly three categories: capacity, connectivity, and capability. There are growing challenges around and increasing and an aging population, and all that entails in terms of economic and social activities. It is, therefore, vital that our transport networks have the ability to carry increasing and diversifying demand, that they connect with where people need them to, and that organisations and individuals have the resources and abilities to deliver and make use of them.

As stated already, by 2050 the capital will need 50 per cent more public transport capacity. Crossrail 2 is, therefore, a vital project that will provide much-needed capacity on a network that will soon have to cater for ten million residents, as well as numerous commuters from outside London.

Transport for London has a swathe of other initiatives, however, including the existing upgrade programme to the Underground network that will see 36 trains per hour on the Jubilee, Piccadilly, and Northern lines by the mid-2030s. This will increase peak capacity on these lines by between 20-50 per cent.

There are also plans to extend the Bakerloo line south from Elephant and Castle to Lewisham and beyond, transforming connectivity in South London. The modernisation of key central London stations including Holborn, Euston, Victoria, and Waterloo, that will also be a catalyst for the growth and development of the surrounding areas, is also proposed.

On the rail network, the long term aim of the Mayor's Office and Transport for London is to gain further control of the commuter routes in and out of the capital. This has the potential to transform the rail network inside London's boundaries into the equivalent of a second tube network, in terms of capacity.

Through closer collaboration with Network Rail to provide more trains and carriages per hour, the authorities in London feel it is possible to carry twice as many passengers than at present, reducing crowding.

As for London's roads, in terms of strategic interventions, again Transport for London has significant plans in this area, with up to three new river crossings proposed for the capital east of Tower Bridge and a new inner orbital tolled road tunnel that could see congestion reduced by 20 per cent in central London.

ACE's members feel that the best way motorists can be supported is to provide them with a reliable asset, i.e. the road, with as little disruption as possible and as cost-effectively as possible. They feel this can best be achieved by closer collaboration with all the parties involved in this process, from Highways England, TfL, the GLA, and the boroughs.

This collaboration will have the same benefits as those outlined above. More innovative solutions will be delivered with less disruptive last-minute changes that add cost and time onto a project. Motorists will therefore be able to enjoy a better quality road and journey, traffic will flow more smoothly, and the business of the capital will be conducted more efficiently.

Continued support should also be provided for efforts to promote cycling in London, with the provision of improved infrastructure, particularly along the capital's roads and in the form of the Cycle Superhighway network. For example, 'rest areas' along the routes could be introduced with covered areas, access to tools, and volunteers from the London Cycle Campaign during weekends. This could help people adjust their bikes and provide support for those cycling with children.

Much of the work to develop these options is already being carried out by Transport for London, along with the correct staging and prioritisation of the projects across all modes of transport. ACE would encourage any recommendations from the National Infrastructure Commission to take this into account and to ensure that the construction sector's desire for certainty through a visible and stable pipeline is met as far as possible.

Q3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Crossrail 2 on its own has a cost-benefit ratio that will see around £1.80 generated for every £1 invested in the project, according to research by consulting firm PWC. This increases to a range between £2 and £2.60 when wider economic benefits are taken into consideration according to the same research and from data provided by AECOM, the global engineering firm. 4 London First in their report, Funding Crossrail 2, estimate that it could be even higher, at £4.10⁵

⁴ *Crossrail 2 Funding and Financing Study* (2014), PWC, p. 11

⁵ *Funding Crossrail 2* (2014), London First, p. 6

There exists significant opportunities, therefore, to dramatically increase the already significant benefits to London and the whole UK when constructing and operating Crossrail 2. Much of this will involve factors beyond the scope of a purely transport-focussed project and hence will need input from a multitude of stakeholders and interested parties, and require broader consideration than other projects.

There will be a massive opportunity for significant regeneration all along the route of Crossrail 2, from the area around Shepperton and Chessington in the South to Cheshunt and the upper Lea Valley in the North. This could represent a substantial number of jobs, housing, and prosperity in areas where it could do a lot of good.

In addition, this is an excellent opportunity to line up major infrastructure projects in order to get the most out of supply chain efficiencies, skills developments, and therefore save on costs. London is embarking on a number of projects that require, for instance tunnelling skills and if schemes are planned properly it will be possible for these trained experts to transfer from one project to another seamlessly.

This will have the benefit in the first instance of training up a large number of skilled experts, benefitting them and the wider economy. It will also enable the UK to position itself as a global expert in tunnelling as our engineers are trained up and gain first-hand experience of what it is like to engage in this kind of work. Finally, there will then be little need to scour the world for expertise, driving up costs, and relying on externalities not influencing the labour market.

This is just one example as well, there are multiple disciplines that will be needed to undertake a project such as this and that present an excellent opportunity in training and developing an expert workforce.

Finally, committing early, planning thoroughly, and lining the project up so that it fits seamlessly into a programme of other large-scale infrastructure projects will ensure that all companies involved in the process can themselves plan effectively, allocate resources efficiently, and enable the project to be delivered on time and on budget. Certainty is the key to delivering a project like Crossrail 2.

Q4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

- What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?
- What innovative funding mechanisms could be considered to support delivery of key schemes?

ACE supports a mixed approach to the funding and financing of London's transport infrastructure improvements, especially when it comes to Crossrail 2.

Specifically on Crossrail 2, ACE feels that much good work has been done by the London First Crossrail 2 working group, which published a report looking into this particular issue, and would encourage the National Infrastructure Commission to give strong consideration to its recommendations.⁶

Based on 2012 prices this would involve a grant from central government of around £4 billion, while Network Rail would contribute £2 billion to a final cost of around £16 billion, subject to an exact contingency figure that Treasury insists on incorporating into the total. These figures, however, would be more than recouped by government and the UK's rail infrastructure owner through increased tax revenues and reduced congestion on the existing network.

Contributions totalling just over £6 billion from the existing Transport for London farebox and borrowing based on Crossrail 2's potential farebox should also form a significant part of any funding of the project. Contributions from developers, as well as the potential for intensified development of land in and around stations could also bring in around £3.5 billion, along with another £2.5 billion in the form of council tax and business rate contributions.

A significant source of funding, however, could come from a greater amount of fiscal devolution. At present a mere seven per cent of all the tax paid by London residents is retained by the Mayor of London and the boroughs, while the equivalent figure for New York is around half.

Devolving control of property taxes, as well as lifting borrowing ceilings, in conjunction with a parallel reduction in the grant from central government would see funding of around £5 billion made available for the Mayor of London. This could then be put to use on Crossrail 2, or indeed, other infrastructure projects in due course.

This last point is an essential one too, for funding future projects beyond Crossrail 2. This fits into the government's agenda around devolution, and would be consistent with measures implemented in other areas of the country such as Cambridge and Manchester. In addition, it could also help to meet the target of eliminating the deficit and paying down the national debt.

This kind of mixed approach should be one that becomes the standard for delivering large scale, long term infrastructure in London. The exact nature of the make-up of each element should be within the remit of Transport for London, however, with the options of

⁶ London First, *ibid.*

borrowing money, requesting funds from central government, eliciting contributions from developers and business partners, all contributing.

Ultimately, this will contribute to the certainty that the construction sector requires through the ability of Transport for London to plan into the longer term and fund projects itself without as much recourse to central government. In turn, Whitehall will benefit from increases in tax revenue and improved efficiencies in the capital.

Q5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

In ACE's view, there are three case studies of major metropolitan areas in other countries that have shown innovative responses to similar challenges and priorities that London is itself facing. These are Paris in respect of long-term certainty, Hong Kong in respect of innovative funding solutions, and New York in respect of devolution of powers.

We have that in Paris, the authorities there have developed an ambitious, innovative, and fully funded plan for almost every aspect of their transport network up to 2030. Known as 'Le Nouveau Grand Paris', this has allowed all those involved to plan thoroughly, align projects to enable the efficient allocation of resources, and ensure budgets and timetables were realistic and achievable.⁷

In Hong Kong, public transport is operated by the Mass Transit Railway (MTR) Corporation, one which posted a \$2 billion profit in 2012. It did this through 'value capture', taking advantage of the uplift in values and profits through the increased passenger traffic that is provided by their services. This can then go to subsidising further expansions and upgrades, all while keeping fares low.

Finally, as stated above, we have seen New York enjoy high levels of fiscal devolution, with around 50 per cent of all tax revenues raised in the city remaining there. A similar approach in London, with more of its funds being placed at the disposal of the Mayor, would enable greater decision-making ability and allow for increased certainty through improved planning.

⁷ *Le Nouveau Grand Paris* (2015), Syndicat des transports d'Île-de-France, http://www.stif.org/IMG/pdf/dpi_2015_ensemble-fiches-projets_mel_bis.pdf

National Infrastructure Commission: Call for evidence

APM background

The Association for Project Management (APM) is a registered charity with over 21,000 individual and 550 corporate members making it the largest professional body its kind in Europe. APM is committed to developing and promoting project and programme management through a wide range of activities including membership, qualifications, events and enhancing standards and knowledge in the profession.

About APM's call for evidence and background of respondents

APM held an online survey which was open to members and the wider project management community. Responses came from a wide variety of business sectors such as transport and logistics, consultancy and construction as well as a broad spectrum of roles including project managers, academics and company directors. The timing of the call for evidence reduced the opportunity for the fullest consultation, so this document presents an informal synthesis of responses received, rather than a formal statement of APM policy.

NIC Call for evidence

I Connecting northern cities

1) To what extent are weaknesses in transport connectivity holding back northern city regions (specifically in terms of jobs, enterprise creation and growth, and housing)?

Respondents felt that weaknesses in transport connectivity are currently playing a major role in holding back the development of enterprise creation and growth in northern cities. Job creation was also an area of concern in terms of connectivity with respondents noting that connectivity played some extent in regards to this issue. Housing was not a great issue amongst respondents, with most believing that connectivity had little or no impact on the northern housing market.

2) What cost-effective infrastructure investments in city-to-city connectivity could address these weaknesses? All transport modes are open for consideration.

Some respondents noted that road users could be reduced by expanding the Manchester Metrolink into Cheshire which would primarily serve to support the Cheshire hinterland around Manchester. It was felt that Manchester Airport railway station has a useful range of services but the lack of parking, very limited pick up and no bike facilities, means it is impractical for many would be travellers particularly locals who have not flown into Manchester Airport. A railway link from Manchester Airport south connecting into the Manchester- Chester line, would considerably improve the access to the Airport from Chester and surroundings. Modern electrified rail services with fast and reliable commuter services are desperately needed throughout the north of England, both between and within cities. Rail connection to airports such as Leeds and Manchester are essential. Rail networks should also consider more reliable goods transport to take heavy goods vehicles off the road thus rail development should be prioritised over building new and enhancing existing roads.

All respondents felt that, although road transport will continue to be highly important, is important to note that it is only one form of communication and is currently close to maximum capacity. Respondents noted that by including on-line and virtual communication methods when considering infrastructure investments, it would be easier to identify the essential from the nice-to-have. It was felt that a policy of nationally driven localisation would create the capability for regions to identify and resolve their own transport needs which would speed up action and create a greater focus on sustainable regional needs.

In terms of funding, respondents believed that the current regulated privatised system in key transport modes exposes the taxpayer to all of the downside risk and the private sector to all of the upside risk. They considered whether it would be possible to run a multimodal tender where private and public sector bid on the same basis. It was felt that running a tender like this, with all costs truly pushed up front, allows for the different bodies real risk appetite to be shown, ensuring that a true cost can be identified and assessed appropriately.

3) Which city-to-city corridor(s) should be the priority for early phases of investment?

Respondents considered a number of potential corridors which they felt should be considered as priorities for early phases of investment. These included:

- The expansion of the Metrolink into Cheshire
- Hull and Grimsby (docks) to Leeds
- Leeds to Birmingham
- Leeds to Newcastle
- Manchester to Birmingham
- Manchester to Liverpool

4) What form of governance would most effectively deliver transformative infrastructure in the north, how should this be funded and by whom, including appropriate local contributions?

It was suggested that a strategy of regional empowerment could involve some type of pan-northern political body to make the decisions. This could potentially be headed by Ministers and include northern MP's and Councils with oversight from central government to ensure that national interests were not compromised when achieving only local gains. The advantage of such an approach would be centralised information and idea sharing which might stimulate growth with sustainable solutions conceived by the areas impacted by change. It was also felt that local employers should have a voice and thus involved in the funding solution.

Funding could be from a combination of central and regional potentially supported by fairer distribution of existing subsidies, possibly away from London, and by reducing road infrastructure development in favour of rail and by private contributions from rail operators as well as government capital and borrowing.

5) What are the key international connectivity needs likely to be in the next 20-30 years in the north of England (with a focus on ports and airports)? What is the most effective way to meet these needs, and what constraints on delivery are anticipated?

Respondents believed that both Leeds-Bradford and Manchester airports had the potential for expansion but require enhanced rail links and more long distance flights in order to reduce the need to travel to airports in the south east. All respondents noted that northern ports have an important role to play in terms of international connectivity over the next 20. Sunderland, Grimsby/Immingham and Hull were cited as potential models which would serve to support UK import and exports and hopefully help support a northern powerhouse built around engineering and advanced manufacturing. Success at these ports may also open the way for Newcastle or Middlesbrough ports to be further developed to respond to changes in demand and volume.

2 London's transport infrastructure

1) What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

Nearly all respondents believed that the UK is overly reliant upon London and the South East which has led to over-crowding, inflated property prices and increasing pressure upon its infrastructure and services.

Many also felt that this 'London centrality' fuelled unnecessary travelling into London whilst creating a lack of investment in the northern cities and elsewhere. Most respondents felt that incentives are needed to encourage people to move to other parts of the country to utilise the available resources and capacity in other UK settlements.

2) What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

Respondents only offered limited guidance in answering this question but many felt that large scale infrastructure developments could be diverted from London to northern cities.

3 Electricity interconnection and storage

1) What changes may need to be made to the electricity market to ensure that supply and demand are balanced, whilst minimising cost to consumers, over the long-term?

Many respondents noted that in the short term, local generation through wind and solar energy should be encouraged and supported, with some local storage and less reliance on the national grid. Demand management can only be assisted by improving housing stock and price incentives. Participants noted that the UK faces a major power supply shortage with poor resilience, lack of generating capacity and poor distribution. Most of the market questions cannot be addressed adequately until secure supply is achieved.

2) What are the barriers to the deployment of energy storage capacity?

Much household demand could be for low voltage, such as can be generated by solar energy and stored in batteries. Respondents suggested that new housing might have a low voltage distribution network for lighting and electronic items. For higher voltage storage, options were limited.

3) What level of electricity interconnection is likely to be in the best interests of consumers?

Respondents believed that one of the main issues is the fragmentation of the market which makes it impossible to coordinate interconnection. Participants considered that a larger grid may not be required if there were more localised generation and storage.

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January 2016

National Infrastructure Commission call for evidence – London’s transport
infrastructure
IPSE response

January 2016

ADVISING
EMPOWERING
INSPIRING
SUPPORTING
ENABLING
INDEPENDENT
PROFESSIONALS

About IPSE:

- The Association of Independent Professionals and the Self Employed (IPSE) represents the estimated 4.5 million individuals working for themselves in the UK.
- Over 97% of our 20,000 members work through their own limited companies
- IPSE also represents 48,000 self-employed construction workers through our relationship with leading construction contract and payroll providers Hudson Contract
- Research has shown that independent professionals allow businesses to promote innovation, maximise performance across peaks and troughs in demand, and create jobs by increasing the level of innovation and efficiency in the economy.

London's transport infrastructure

- 1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?**

Housing

With London's population expected to hit ten million by 2030, the development and provision of appropriate housing is clearly going to be a major challenge in the coming years. Welcome steps are being taken to address this, for example with the £103 million funding package announced by the Mayor of London in 2012 to support the development of 2,700 homes. Similarly, IPSE was pleased to hear the announcement from the City of London that it planned to build 3,700 new homes by 2025 on housing estates and other land it owns outside the Square Mile.

To ensure these projects are fit for the way people will work in the next two to three decades, IPSE believes government should ensure that new housing developments are equipped with fibreoptic broadband as standard. This will be particularly beneficial to the growing numbers of self-employed individuals in the labour market who are looking to strike out on their own and grow a business.

There are already 4.5 million individuals working for themselves, delivering flexible expertise to a wide range of businesses while enjoying the autonomy this way of working offers. As the [2013 paper](#) by Professor Andrew Burke illustrated, independent professionals allow businesses to promote innovation, maximise performance across peaks and troughs in demand, and create jobs by increasing the level of innovation and efficiency in the economy.

This focus on housing will provide a big boost for the UK's construction sector, where 2.1 million individuals work contributing £103bn, or 6.5% of total economic output, to the UK economy.

Flexible workspace

As the labour market continues to shift, with individuals choosing the greater autonomy that comes with self-employment, government will need to pay greater attention to where people work. Those working independently are increasingly opting to work in collaborative workspaces known as "workhubs" – there are an estimated 40 in London today.

Workhubs typically consist of hot desks, meeting rooms and high speed broadband. They also offer services such as IT and business support and other training programmes. This collaborative way of working provides a motivating environment, as well as helping to build a community of like-minded individuals. As research from the Brighton Fuse project has shown, this environment allows freelancers to more easily share ideas, innovate

and ultimately grow their business. It is however difficult, and often financially prohibitive to open and run premises.

Indeed one third of 18-39 year olds identify cost as a major reason why they do not use workhubs. Freelancers unfortunately do not benefit from the tax system in the same way most small businesses do. This is because small businesses with premises are exempt from paying business rates, yet those using workhubs are effectively forced to pay them indirectly. This is because they are typically a significant part of the operating cost of many workhubs, which are often run by collectives of self-employed workers.

As this way of working becomes even more common, the planning system may prevent the speedy rollout of workhubs. Identifying a site is one thing, but getting planning permission can be difficult. Reclassifying retail properties as office space has proven difficult for a number of workhub developers.

To support this way of working, IPSE believes action is needed in four key areas:

- Cut business rates for workhubs – small businesses with a rentable value up to £10,000 are eligible for 100% business rate relief – extending this to workhubs would ensure independent professionals are also effectively incentivised to develop and grow their business
- Incentivise the use of empty properties as workhubs – councils could easily address this blight by publishing interactive maps of disused buildings in the area. This would include the dimensions of the property, its rateable value for business rates and its previous use.
- Extend Permitted Development rights to allow empty premises to change their use – government should explore allowing empty retail premises (A1, A2, A3 & A4) over 500m² to be reclassified as B1 office space under permitted development rights.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

Transport connectivity is vitally important for the self-employed. IPSE survey data from 2015 found that independent professionals travel on average 1,775 miles each month to their place of work, while spending £8,056 each year on transport costs.

Investing in all forms of transport infrastructure is therefore vitally important in allowing freelancers the freedom to travel quickly, delivering flexible expertise to businesses of all sizes. When travelling by rail, policymakers can also go further in helping freelancers work on the move. Ensuring rail franchising agreements include a commitment to enabling WiFi across their networks will provide a productivity boost to the large number of freelancers who regularly travel into or from London.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

As with all large infrastructure projects, greater effort needs to be made to open up the procurement process to smaller businesses and collaborations of independent professionals. Often it is only the very largest businesses who can compete here, given the onerous compliance requirements and very complex contracts.

But this does not always lead to satisfactory outcomes. The cost and complexity of large contracts can lead to delays and ultimately hit the public purse. For example, it was widely reported in 2015 that taxpayers could be hit with a bill for up to £700m after the government reportedly lost a legal battle with Fujitsu over a failed NHS

IT system. The Fujitsu Connecting for Health contract was part of the £12bn NHS national programme for IT, large parts of which have had to be abandoned at a cost estimated by the National Audit Office to be £2.7bn.

As important infrastructure projects are delivered in London over the next twenty years, government clearly needs to move away from its dependence on larger suppliers to deliver projects, instead effectively using the unique flexible expertise that independent professionals offer and the value they deliver for complex projects.

In delivering large infrastructure problems in London, government should build on its ambition that 1 in every £3 of government spend will be with SME. It should go further in breaking up contracts, committing to a sub-target that a quarter of spend within the SME ambition will be with microbusinesses including collaborations of independent professionals.

In addition, government should commit to publishing tender documents in an open source, editable format. This would allow microbusinesses to suggest revisions and flag up aspects of the contract which present difficulties.

It is of course inevitable that some large London infrastructure contracts will be awarded to larger businesses, but this doesn't mean independent professionals have no role to play. A Cabinet Office study has found that the fifty largest suppliers to government are responsible for 35% of government spending, and there must be a role to play for our smallest businesses further down the supply chain.

IPSE believes a greater onus must be placed on these large "tier 1" contractors to demonstrate how they will open up opportunities for subcontracting to the widest possible group. Tier 1 contractors should be expected to publish details of who they contract with in order to promote accountability.

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London's transport infrastructure

What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

London faces a number of key challenges over the coming decades. The City continues to grow at a rate not seen for many years (the fastest rate in 80 years) and our work has shown that the existing London Plan and the Mayor's London Infrastructure Plan (2050) are underestimating the level of population growth and employment growth that the city can expect over the next 25 years. This has significant implications for London in relation to how the population can be accommodated, how people will travel to work, access to job opportunities, the city's environment and quality of life. The hard and soft infrastructure that will be required to support this growth will need to be planned to deliver these greater levels of growth, but will also need to be adaptable to future changes in the economy, environment and society.

The recently published Atkins report Future Proofing London (which can be downloaded from our [website](#)) identifies four key interlinked risks that London faces which include:

- Housing - A failure to meet the city's housing needs
- Economy – the economy becomes less diverse
- Society – society becomes more unequal, and increased social tensions impact on London's stability
- Environment – the city's continued growth degrades the environment further impacting on quality of life

The following provides further detail on each of these key economic and social challenges and provides a reference to the appropriate section in the Future Proofing London report where further illustration and detail on these points can be found.

Population and employment growth greater than expect and planned for

As part of our work on Future Proofing London we worked with Oxford Economics to look at future population and employment scenarios for London. Oxford Economics forecast London's population to reach 12 million by 2050 compared to the London Infrastructure Plan (2050) that projects the population to reach 11.3 million by 2050. This is a difference equal to the current size of Manchester.

The London Infrastructure Plan forecasts jobs to reach 6.3 million by 2050, this is a level that Oxford Economics forecasts will be surpassed by 2026.

If these projections that underpin London's strategic and infrastructure planning are underestimating the level of growth that is likely in London, then the city will be failing to plan properly for its growth, and the risks we have identified will be exacerbated.

(for further detail on the population and jobs growth see section 3 pages 38-40 of Future Proofing London).

Housing

Housing is a vital piece of the city's infrastructure, without sufficient housing London cannot continue to accommodate population growth and house those that work in the city. Housing demand continues to grow as the population increases and with population estimates identified above this demand is not set to ease any time soon.

Supply is failing to keep pace with demand, current rates of housing delivery (26,000 pa) are well below London Plan housing targets of 42,000 pa, and the London Plan target itself is likely to be below what is actually required (with many suggesting 50,000 homes per annum are required).

The increasing demand for housing and the chronic undersupply of housing are combining to make housing affordability a serious issue for London. On top of this, wages have not increased at anywhere near the same rate as house prices, this is not just an issue for those on low incomes but also for those on medium incomes.

These housing issues are pushing people out of both central London and London entirely to find a place to live. Some of those moving out of London are retaining their jobs in London resulting in ever greater commuting distances.

(for further detail on housing challenges facing London see section 4 pages 45-50 of Future Proofing London).

Economy

Jobs growth over the past 15 years has been focused on the Central Activities Zone (CAZ) with less growth in outer London. With job densities much greater in inner London, many outer London residents are reliant on commuting to jobs in central London. The trend in greater job growth in inner London compared to outer London is expected to continue and as a result there will be a need to consider the implications this has for outer London communities and London's transport infrastructure.

Much of the job growth has been in high value sectors (such as professional, real estate and scientific and technical activities) again with the greatest concentrations of growth in these sectors being in inner London. However the cost of housing is impacting on the ability to fill graduate vacancies in these professional sectors. The housing crisis could lead to labour shortages (across all sectors of the economy) and / or increasing reliance on people commuting from greater distances to fill jobs.

Coupled with the growth in high value sectors has been the decline in employment in lower skilled jobs, which are forecast to decline further. This continued shift to a higher value economy has its benefits (particularly in terms of GVA growth), but it also presents challenges with regards to whether there are sufficient job opportunities available to the lower skilled population.

The sectors of the economy that will see substantial jobs growth in London are going to change, with greatest growth in professional, scientific and technical services (28% of all jobs growth 2015-2030) administrative and support (16%) and information and communication (10%)

and limited growth in financial services (0.6%) in what has traditionally been a big growth sector for London. Many of the businesses in knowledge based sectors are small scale and often rely heavily on affordable and flexible business space, rather than traditional office accommodation. With the continual loss of industrial and business space to competing land uses (such as residential) these sectors may find that land and premises availability and affordability act as a constraint on growth.

(for further detail on housing challenges facing London see section 4 pages 51-57 of Future Proofing London).

Society

Inequality in London is getting worse and poverty is shifting to the suburbs, compared to a decade ago when poverty was more evenly dispersed. Whilst the number of wealthy households in inner London has increased by 203% between 1980 and 2013. Recent data shows a large proportion of overseas buyers for inner London homes, and a high proportion of residents in inner London with second homes.

Despite the growth in London's economy, deprivation levels remain high in much of east and south east London. In west and south west London there are higher levels of residents with managerial and professional jobs and higher income levels than east and south east London.

There has been greater growth in those seeking job seekers allowance in outer London than in inner London and the growth in unemployment rates have been much higher in east and outer east London.

These clear patterns of suburbanisation of the less wealthy coupled with a forecast for more modest growth in job opportunities (particularly in higher value sectors) in outer London, will mean that the increased polarisation of London's society is set to continue. The implications of this are likely to be

- greater social unrest impacting on stability of the city
- reduced social mobility and loss of human capital, which ultimately can limit economic growth and innovation
- poorer physical and social health as a greater section of society find it difficult to access social and cultural opportunities
- more volatile economic growth

(for further detail on housing challenges facing London see section 4 pages 58-64 of Future Proofing London).

Environment

Environmental changes as a result of both climate change and the Cities population growth have the ability to impact on London's economy and society.

There is a significant amount of residential, commercial and community premises and vital infrastructure that is within the Thames tidal floodplain. Climate change could lead to increases in sea levels which in turn will increase the risk of tidal flooding and increases in heavy rainfalls

leading to an increased risk of fluvial flooding. With the potential for significant loss of life and damage to property there will be a need to ensure that London invests appropriately in ensuring its flood defence infrastructure is fit for purpose.

Surface water flooding is also a key issue and likely to increase as development of the city continues and climate change impacts take hold. London is vulnerable to surface water flooding with 16 of London's boroughs identified in the top 20 districts in England as susceptible to surface water flooding.

London is one of the most water stressed cities in the world. With an increasing population the issues related to water scarcity are likely to increase. London will need to consider how it manages water demand downwards and or looks to secure water supplies in a different way, although it will be vital that any alternative water supplies are sourced sustainably.

London is susceptible to Urban Heat Island effect due to the high-rise form and density of development. Increasing summer temperatures have the potential to lead to a greater number of heat-related deaths, an increase in respiratory illness and a decline in labour productivity.

In addition to the environmental risks associated with climate change, air quality is another challenge that London faces as it continues to grow. The majority of pollution in London comes from transport and congestion. The additional growth that is expected in London will generate additional trips with a further impact on emissions. Air quality is a significant challenge for the city as poor air quality is harmful to human health and ultimately reduces the quality of life in London.

(for further detail on housing challenges facing London see section 4 pages 65-68 of Future Proofing London).

National Infrastructure Commission
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Balfour Beatty's submission to the National Infrastructure Commission inquiry into future investment in London's transport infrastructure

1. Introduction

Balfour Beatty is a leading international infrastructure group. With 20,000 employees across the UK, we provide innovative and efficient infrastructure that underpins our daily lives, supports communities and enables economic growth.

As this country's largest infrastructure Group, Balfour Beatty has more than 100 years of experience globally, and draws on the engineering skills and innovation of over 20,000 highly committed employees across the UK. Balfour Beatty finances, develops, delivers and maintains the increasingly complex infrastructure that underpins this country's daily life – in transportation, power and utility systems, social and commercial buildings. We are committed to London. From the Crossrail Liverpool Street and Whitechapel Station tunnels, to the £590 million Heathrow Terminal 2B project and the £300 million Aquatics Centre for the London Olympics, Wembley stadium, the Channel Tunnel Rail Link and soon the £416 million London 'Super Sewer' scheme, our expert teams have for many years helped to make the London landscape – both visible and invisible – what it is today, ensuring it can to continue to grow as one of the world's leading capital cities.

This note draws on our expertise to set out some of our thoughts on the key questions relating to the future of London's transport infrastructure.

London is facing unprecedented population growth, projected to reach 10 million by 2030 and more than 11 million by 2050¹. In order to support this growth, London's infrastructure will need continued investment to ensure it can maintain its status as a world class business location, competing with other top tier cities around the world and acting as a driver of the UK economy. Of course, significant transport investment is already underway in London, from Crossrail 1 to High Speed 2 and Thameslink, but more is needed. For example, much of London's commuter rail network is already operating at capacity in peak hours: additional capacity is required to tackle existing overcrowding and to support future growth.

Infrastructure requires vision, ongoing investment and consensus. Major projects take years to plan, build and develop; they are often disruptive to everyday life, especially in densely populated London, and their benefits are not felt within one electoral cycle or immediately understood by the public. The costs of disruption in London are high and the design of old-fashioned legacy systems often constrains options today. Prioritising and realising large projects requires political will. As much as possible, consensus is required for good infrastructure planning. The Olympic Park, where Balfour Beatty constructed the award-winning London 2012 Aquatics Centre, is a good example of what can be achieved with cross-party political support, while other worthwhile projects either do not happen or are slowed considerably if they do not have it.

¹ London Infrastructure Plan 2050, Mayor of London

In our view, there is a real need for clear long-term plans that have cross party support. In March 2015, the Mayor launched a long-term infrastructure plan², with the objective of setting out London's infrastructure needs and how to pay for them. As part of this, London's Infrastructure Delivery Board³ was established to bring together the interested parties in developing the programme of infrastructure works and advising on their deliverability, enabling the Mayor to seek to gain cross-party support. While Balfour Beatty welcomes the establishment of the Board, this body is still very new and has no statutory role, so it remains to be seen how effective it will be.

Balfour Beatty strongly supports investment in London's infrastructure. We believe that it is important not just to maintain London as a global city and to ensure that those that live and work there have access to the services they need, but that continued investment in the capital is vital to the UK economy as a whole. However, we would caution that investment in London or in the North of England should not be viewed as a 'zero sum game'. The two should be considered together for the good of the national economy, and both should see increased and sustained investment.

2. Responses to specific questions outlined in the Inquiry

What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

The challenges facing London are, in our view, mostly linked to its continued and rapid expansion. How to house the increasing population, how to transport people around the capital, and how to accommodate their other infrastructure needs including access to office space and business parks such as Tech City and the Advanced Business park, for example. There are of course many other social challenges, such as community cohesion, which we do not feel qualified to express views on. Here we outline a small number of the main challenges which we do have experience of:

- Delivering and maintaining infrastructure: London's transport infrastructure is already struggling to cope with current peak demand, a situation which will be further compounded by population growth and by plans including as High Speed 2 (HS2): the first phase of HS2 is due to open by 2026, which will mean large numbers of additional passengers to Euston station, where the Underground station is already at capacity. The opening of the second phase of HS2 in 2033 will place further burdens on routes to and from Euston.

A key economic challenge lies therefore in ensuring London's infrastructure is up to scratch. This is a twin challenge of planning and delivering new infrastructure; and ensuring the efficiency and maintenance of the city's existing infrastructure. The ability to rise to this challenge relies, in our view, on the level of forward planning and ability to adapt to changing circumstances and of course it requires regular and sufficient investment. Furthermore, infrastructure investment is most effective when developments are integrated from the initial vision, through the planning process all the way to implementation. Projects such as the Channel Tunnel Rail Link, the Jubilee line extension and Crossrail show what can be achieved when these requirements are all delivered.

While we understand that it is not part of the NIC's remit, we also believe that an early and final decision on aviation capacity in the South East needs to be taken. Of our closest competitors, Frankfurt has four runways; Schipol, six runways; and Charles de Gaulle has four runways. The continued delays are, we believe, damaging the UK's competitiveness.

² Ibid

³ <https://www.london.gov.uk/what-we-do/business-and-economy/better-infrastructure/london%E2%80%99s-infrastructure-delivery-board>

- Housing shortage: Currently, fewer than half of London's target of 42,000 homes are being built, and the numbers seem to be going in the wrong direction: there were around £4.5bn in orders for new housing construction in London in 2014/15, down 16% from the previous year⁴.

The housing shortage has a number of economic impacts. Low and middle income earners are being increasingly priced out of London. Increasing house prices are negatively impacting firms' ability to recruit and retain staff: the CBI/ CBRE London Business Survey⁵ found 32% of businesses saying that they are unable to offer flexible part-time employment due to the time/cost of the commute into London for employees who cannot afford to live locally. Similarly almost a third of firms said that employees are moving away from the local area and therefore having to leave their jobs as housing costs are too high. This is problem employers are facing now, but it is likely to get worse in future, especially for key workers such as nurses and teachers.

As some employees are forced to move further out of the capital due to rising housing costs, getting people from London's outer regions and from the wider country into London quickly and affordably is key. Transport connections are vital for commuters and Crossrail 2 will play an important role in facilitating these journeys.

Another point to consider if London is to deliver a greater amount of housing stock, is that density levels within the city may need to increase. London is not dense in comparison to places like Hong Kong for example. Discussions will be needed around the level of density that is acceptable and where this will take place.

Of course, the social angle of the housing shortage is significant. The most recent report on London poverty outlines that 1.2 million Londoners in poverty live in a working family, up 70% over the last decade⁶. The report highlights that, in a continuing trend demonstrated in the four previous editions, a key driver of poverty in London is the affordability of housing. With a shortage of affordable housing, the only option for low-income households is private renting, however, rents have increased by 19% in London in the last five years (compared to the 11% average across the country) resulting in an average private rent of £1,600 per month (more than double the £770 average in England)⁷. Indeed, average private sector rents in London are more than twice the national average for all property sizes⁸.

- Skills: London is a global city, a member of small elite group of cities that competes in an international market to attract highly skilled mobile workers in areas such as creative and media, financial services, IT software and global services. A well educated workforce and a deep skills base are crucial to enable it to maintain its position as a global city, and one which continues to see significant economic growth. However, every year India and China educate more than four million graduates, compared with just over 250,000 in the UK⁹. If something were to significantly reduce the flows of skilled immigrants from overseas into London that recent years have witnessed, this problem is likely to be compounded.

⁴ [ONS, New orders in the construction industry](#)

⁵ CBI/ CBRE London Business Survey 2015

⁶ New Policy Institute, London's Poverty Profile 2015, October 2015

⁷ Ibid

⁸ [Valuation Office Agency private rental market statistics](#)

⁹ Europe Economics, The Competitiveness of London – Future Challenges from Emerging Cities, 2008

In the infrastructure industry, designing, constructing, operating and maintaining the infrastructure which keeps London moving requires specialist skills and experience. In order to make sure we have the skilled labour necessary to build the transport networks, buildings, rail and runways and so on, it is important to ensure that London develops and retains the required level of skilled resource. Business needs confidence in the quality of the pipeline in order to ensure it has the skilled staff for some of the specialist roles in major projects. This is especially the case where new skills are required for innovative schemes.

Balfour Beatty welcomes and supports the government's ambitious plans to create 3 million more apprenticeships by 2020. We invest in apprenticeship programmes across a broad range of disciplines, employing over 150 apprentices each year in the UK in addition to the 320 currently under training in a diverse range of roles across the business¹⁰. We employ around 700 more young people on graduate and part-time higher education / degree schemes. However, we do not believe that the apprenticeship levy alone will be enough to meet the shortfall in skilled workers the infrastructure industry needs.

- Flooding: Of course, the impact of flooding from the Thames would be disastrous: not just in terms of the number of businesses and dwellings sited in London and the fact that London is the UK's largest centre of activity, but the Central Government district of Whitehall is also almost entirely within the Thames floodplain. Furthermore, the damage to London's transport infrastructure would be significant: much of the central area of the Tube network is based within the floodplain and 86 railway and underground stations, eight power stations, 1,000 electricity substations and 16 hospitals could be at risk¹¹.

However, assuming that the Thames Barrier continues to perform and that the Thames Estuary 2100 plan works, the other, less manageable threat is in the form of surface water for example, following prolonged heavy rainfall in the Thames catchment area. The amount of impermeable surface cover in London, such as concrete on pavements and buildings, means that rainfall runoff from the land into the drainage systems and rivers creates a build-up of water and potentially fluvial and surface water flooding. Drainage systems may have inadequate capacity or become blocked leading to further flooding. The more building there is and the less green space, the more pronounced this problem becomes. Climate change, with its projected extremes of weather and wetter winters, is likely to add to this and the City of London have identified surface water flooding as one of the most serious challenges London faces¹². Therefore robust and effective management strategies and flood resistance and resilience measures need to be put in place in order to mitigate the risks and opportunities for integration should be capitalised on. For example, the capacity of green space to reduce flood risk is rarely factored into the planning or design of parks.

- What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

Balfour Beatty's priorities for strategic investment options for London are:

- A. Crossrail 2: Crossrail 1 will deliver a 10% increase in transport capacity east to west. However, it will not address the issues of congestion levels on north-south tube and rail lines

¹⁰ <http://www.balfourbeatty.com/index.asp?pageid=364>

¹¹ The Environment Agency's "at risk" list, 2015

¹² <https://www.cityoflondon.gov.uk/services/environment-and-planning/sustainability/climate-change/Pages/surface-water-flood-risk.aspx>

and the need for significant additional capacity due to projected population growth. We believe that a new north-south line linking Wimbledon to Hackney across central London and extending into the suburbs, linking in with London Underground, London Overground, Crossrail 1, National Rail, High Speed 1, High Speed 2, London Trams and international rail services, should be approved as a matter of urgency. The urgency relates both to the need to address the two problems outlined above, but also to the need not to lose the skills and knowledge gained from Crossrail 1 due to a time lag between the two projects. The priority, in our view, is to plan the new rail line in conjunction with housing and regeneration needs.

Firm decisions on the route, a construction timetable and a credible funding package need to be made as soon as possible. We furthermore believe that additional Crossrail lines could follow.

- A. London Underground: As well as developing the new Crossrail 2 line, line upgrades and station works are still necessary to maintain a resilient underground system. We agree with Transport for London that, even with the new capacity the Tube upgrade is bringing online, it will not be enough to meet London's future needs. Investment must continue across the wider tube network: we must ensure that journeys are seamless across the whole network. There will be little point having a good quality, fast Crossrail 2 if the onward tube connections are prone to signal failure, over-crowding and delays.

Furthermore, the areas that are opened up by Crossrail 1 and the potential Crossrail 2 will mean that more people from those areas access the Underground for their onward journeys. Constant upgrades and developments must therefore be factored in as a priority.

- B. New East London river crossings: We agree with the Centre for London report¹³ that there is a need to address the severe lack of crossing capacity on the East Thames. There are three crossings to the east of Tower Bridge, compared to 16 road crossings on the 20 miles of the river west of Tower Bridge. All three of the eastern crossings are regularly congested. However, the population of East London is forecast to increase by 600,000 in the period to 2031¹⁴, and this area of the capital is a key priority for regeneration, housing and jobs.

We support a minimum of two bridges at Gallions Reach, which would connect Thamesmead with Royal Docks; and at Belvedere, which would connect north Bexley with Havering. These options were the two identified by a recent TfL consultation which received 7,500 responses, 90% of which were in favour of new river crossings in east London. The two new crossings would form part of a package alongside the Silvertown tunnel, which would connect the Greenwich Peninsula with the Royal Docks and would play a key role in supporting the population and employment growth forecast for London.

Balfour Beatty believes that the success of the toll bridge at Dartford suggests new projects could be paid for with private finance and money recouped from those using the crossings.

- C. An orbital underground ring road: This would relieve congestion around Tower Bridge and Old Street, as well as the Old Kent Road, the A40 around Acton and the A503 at Woodberry Down.

¹³ Centre for London, Linking London: A New Generation of River Crossings to Revitalise the East Thames, October 2014

¹⁴ TfL, 2015

There are also other points to consider in relation to improving London's future infrastructure, for example:

- One of our observations from our work elsewhere in the world is that, when large-scale infrastructure projects are delivered in this country, opportunities are often missed for infrastructure integration. For example, the Crossrail tunnels that are currently being built could have included broadband fibre, but will not because decisions were not made at the right time. We need to become better at considering all future infrastructure needs upfront at the inception of major projects.
- It should not all be about new infrastructure. Work is also needed to improve the capital's road network and ensure that it is fit for purpose for the projected population increase. Congested roads are a strain on the economy and the environment, impacting London's competitiveness and Londoners' overall quality of life. In our view, smart technology is needed to deal with bottlenecks at traffic junctions for example, including some of the Dynamic Traffic Forecasting methods being used in Barcelona, digital road signs, junction technology and encouraging sat-nav companies to give drivers better real time information. We support TfL's £4 billion Road Modernisation Plan and believe that it could potentially go even further, with an extension to the congestion zone, or an amended charging regime where costs vary based on those roads and times of day where congestion is worst.

3. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

- Building on the Crossrail 1 model: Decisions about public expenditure on London's infrastructure investment are often not taken in such a way that the costs, or at least some of them, are borne by the people who benefit. However it is estimated that local funding sources could meet at least half of the costs of Crossrail 2¹⁵, in part by building on the Crossrail 1 model. This would include ideas such as increasing fares and building on the idea of the Olympic precept for Council tax payers. While these options may be politically unpopular, it is our view that they should be considered in line with the principle that those who benefit should carry some of the burden for the funding. It is in cases such as these that political consensus around future infrastructure priorities is important to achieve.

The Crossrail funding model is interesting in that it brings together a number of sources of funding and financing. Most notably in terms of alternative funding mechanisms it includes a supplementary business rate on larger London businesses of two pence in the pound for approximately the next 30 years. This approach was largely welcomed by London business, which is broadly supportive of the principle that tax and spending decisions should be better aligned. We support work that has been done by PWC¹⁶ and others on demonstrating how a continuation of the Business Rate Supplement and the application of a Mayoral Community Infrastructure Levy could meet 21% of the costs of Crossrail 2. The benefit of these methods having been used in Crossrail 1 lies in the fact that the principle has been established and in the learnings that can be taken from the operation of the schemes.

- Land value uplift / Tax Increment Financing (TIF): Infrastructure investments decisions need to consider all their economic returns from the outset, for example, by capturing increased land values around schemes due to improved transport connections. TIF can enable local

¹⁵ Michele Dix, TfL presentation on Crossrail 2, June 2015

http://www.newlondonarchitecture.org/docs/michle_dix--transport_for_london-1.pdf

¹⁶ PWC, Crossrail 2 Funding and Financing Study, November 2014

authorities to raise funds for infrastructure improvements which will increase economic activity in the future. It has been widely and successfully used in the US and in Hong Kong for many years and is beginning to be used in the UK. One of the conclusions from PWC's analysis is that:

"many land and property owners who have benefited most from the project are not making a commensurate contribution to the project costs"¹⁷.

Crossrail 1 is projected to add more than £5 billion¹⁸ to property values along its route, only a fraction of which is being captured to support the cost of the line. More should be captured in plans for Crossrail 2, which would reduce reliance on national taxation. This is something that could and should be addressed in advance of Crossrail 2.

- Dividing the burden between interested parties: Subdividing major projects into smaller sections with bespoke financing/funding arrangements. For example, the bulk of the project, for example the tunnelling could be simplified and funded centrally, but station development and other elements could be funded and justified separately by local authorities and/or private sector developers.
- Private sector investment in infrastructure: Although there are Pension and Infrastructure Funds for example, which could invest in London infrastructure, their investments are subject to market and policy risk. They require policy certainty from government in the form of clear up-front statements of government policy in key strategic areas, ideally, government guarantees, better coordination within government and rapid implementation of the detailed policy frameworks which can provide the certainty and longevity which the private sector needs to make the business case for infrastructure investment. While this is unlikely to be a viable option for Crossrail 2, due to the size of the scheme, it is possible that private investment could be used for other London infrastructure projects.

Much of the investment in UK infrastructure is undertaken by international businesses which have a choice of markets and projects for their scarce capital, and they will naturally choose those jurisdictions with effective policy frameworks which provide certainty over the longer term over jurisdictions which do not.

Balfour Beatty believes that commitments to long-term infrastructure plans would reduce the cost of delivering infrastructure in London and elsewhere in the country. Longer-term plans teamed with the certainty that they will be followed through would also enable the whole industry to ensure the right resources – both in terms of skills and assets - are in place to deliver. Without this certainty, for example, providers cannot start training the workers needed in the future or ensure their supply chains are in place.

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¹⁷ Ibid

¹⁸ GVA, Crossrail Property Impact Study, October 2012

CALL FOR EVIDENCE

Further to the call to Evidence for the National Infrastructure Commission we have pleasure in detailing some issues and points relating to the national challenges.

1. Improving connectivity between cities in the North of England

Recommendations for cost effective infrastructure investment

Improve the local transport infrastructure to facilitate cross-country links such as Northern Hub

One way to increase employment, housing and enterprise growth will be to concentrate on local transport improvements to facilitate cross county links such as the Northern Hub solution.

Improvements in local transport links and high quality infrastructure are essential for the North of England as they will not only benefit the communities that live there, but also those visiting / commuting to the region which is vital for the local economy.

This focus requires immediate action with full and proper collaboration across all parties including the deliverers.

Provide Superfast Broadband

Superfast broadband makes a positive impact on national and local economies. For the North of England, an area of improvement that will assist in resolving many issues is the improvement in connectivity of IT by supplying super-fast broadband (400MB+) across all the Northern cities.

Faster broadband allows a workforce to work more flexibly which can lead to greater productivity and reduced travel meaning time and money saved.

This solution is relatively low in cost and requires future proofing for at least five to ten years.

Priority early-phase investment

Improvements between Liverpool to Manchester and Leeds, then Teesside to Newcastle

As Sir David Higgins said *'Improving connectivity is vital, if Britain is to compete in the knowledge economy in which this country has a competitive advantage, but in which ease of travel is an essential element'*.

A main focus should be made, firstly, on the Liverpool to Manchester and Leeds connectivity in highways, rail and water.



This should then be followed into Teesside and Newcastle.

The governance of delivering this infrastructure and its subsequent growth needs careful consideration as the devolvement of power and funds to a region is not always cost effective.

The Northern Powerhouse needs to evolve in the same way as TfL - with close collaboration with all stakeholders involved. This will prove very effective, as it has been for London.

Whether the same can be said for the other local authorities and LEPs is questionable, therefore, effective and efficient business cases need to be agreed with monitored results and programmes.

Effective governance

Considerations for finance and funding

The funding of schemes and developments should be considered to prioritise and obtain a greater input for those that will reap the most benefit eg Crossrail 1 and business investment with developers for flood protection.

Many opportunities can be considered within a portfolio finance model with funding and support from organisations outside of the public sector. This is something innovative but difficult to obtain without buy-in from authorities that tend to revert to traditional procurement methodology.

2. London's transport infrastructure

The challenges facing London and recommendations

London is one of the most rapidly growing and congested cities in World. Hundreds of thousands of people travel to and from London for work via overcrowded networks because they have to.



A question to consider: *'Is the relentless growth in London really viable for the future?'* And *'How can this problem be alleviated?'*

Our recommendation, to overcome the infrastructure capacity challenge faced by London, is to invest heavily into adjacent regions and towns surrounding the Capital. If these areas become better and more efficiently connected, accessible and attractive, the problems faced by London will be reduced as fewer people are forced to rely on the London network.

Strategic options for future investment in large-scale transport infrastructure

Short-term solutions

In the short term we need to:

- Enable high speed connectivity and continue to improve rail capacity for the inevitable commuter journeys
- Consider how to develop 'metro type' services - improving signalling and platform usage while bypassing loops in the service
- Provide 24-hour transport services to the rail system to give passengers the ability to change their patterns of travel without any fears of accessibility to and from their place of work. Essentially dissolving the rush hour.
- Embrace the use of applications including UBER within the road network, to obtain increased usage of the highways, relieving strain on infrastructure and transport networks.

Medium-term solutions

In the medium term we need to:

- Resolve the airport aviation issue and ensure we put in place the new runways required.
- Prepare for the future: The introduction of driverless cars is inevitable and we need to anticipate the impact of this mode of transport relative to existing forms. We must therefore develop a transport strategy that combines mass transit with electric and driverless vehicles to ensure our infrastructure is prepared for future innovation.

Long-term solutions

In the long term we must:

- Consider and action infrastructure finance through Value Capture and learn from other past examples of success not only in the UK but from Europe and the US.
- Consider the sharing of knowledge with other Government deliverers and customers throughout Europe and the US. This needs greater emphasis.
- Develop best practice. From a BAM perspective, our nine other international Group companies give a huge depth of learning and best practice which can be shared with others to drive continual improvement in the UK's infrastructure. This needs to be captured to benefit business practices
- Joining together of regulators, especially in the South East, but also across the country, in a forum to give traction and commonality of thinking would provide increased best practice and value savings
- Respond to future plans. The London 2050 Infrastructure Plan includes a wider audience such as Manchester and the outlying regions. This needs positive collaboration and leadership.
- More Mayoral control would bring benefits as it has to date in London – especially in the housing and asset support sectors

Finally, the use of land in the London area and regions needs some firm leadership and direction to spur development and investment. A Mayoral lead in this, again, would be benefit, reducing the negativity realised from Local Authorities.

Opportunities to increase benefits of Crossrail 2

An option for London to consider is whether to build a new metro system, supporting the existing one and complementing the connections that already exist.

CRL1 and 2 would be part of this but further long-term new systems will need to be planned if the growth becomes the 10m as predicted.

On Crossrail 2 we need to be certain of the problem that is to be solved before deciding on the solution. An agreement on what to spend and what must be done to solve the problem should occur before collaborating to achieve the outcomes.

Initial arrangements must be made that meet the budget before any decisions are made on which project to build. Issues such as station locations, tunnel alignment and conservative settlement criteria all have disproportionate cost impacts. These elements need thorough and open discussion with all stakeholders.

Options for the funding, financing and delivery of large-scale transport infrastructure improvements in London

High Speed 2 (HS2) – using Euston not Old Oak Common

Other issues in the London sector are the immediate provision and development of Old Oak Common with the investment and expansion that will follow using the Greenwich and King's Cross models. Simultaneously, HS2 must enter central London at Euston and the development of this facility needs urgent and immediate commitment. Old Oak Common as a terminal to HS2 is not a solution, however,



Euston certainly is. Connectivity to HS2 from Heathrow and other potential outlying areas including Crewe requires immediate commitment and collaboration between all stakeholders in order to make HS2 successful.

Lessons learned which can be applied to London

Sharing knowledge and information is crucial to long-term improvements – building on the success of the Olympic and TfL delivery models.

It is essential to learn from our previous experience and move away from employing the services of advisers with no real incentives. We must also move away from the use of bespoke contracts when we can make positive use of past success such as the Olympic Delivery model and programmes employed by TfL especially in the streets section.

Using Building Information Modelling (BIM) to streamline delivery programmes

The entire 'Process of Delivery' of projects and all 'Programmes of Work' need considering so that construction is fully considered through from procurement to maintenance using BIM to its fullest capacity. We need to discover efficiency of procurement, construction and long-term maintenance that delivers value to customers.

BRITISH PROPERTY FEDERATION RESPONSE TO NATIONAL INFRASTRUCTURE COMMISSION



The BPF represents companies owning, managing and investing in commercial real estate. This includes a broad range of businesses comprising commercial property owners and developers, financial institutions and pension funds, corporate landlords and residential landlords, as well as all those professions that support the industry.

Introduction

1. We welcome the opportunity to respond to the National Infrastructure Commission's call for evidence. Commercial real estate is a key component of the UK's infrastructure, providing the homes, offices, health premises and distribution networks we need for the country to thrive. Infrastructure is crucial to attracting the investment needed to regenerate the UK's town and cities, and the establishment of the Commission is a welcome step in ensuring swift, coordinated decisions over important projects which will ensure clarity and certainty for investors, business communities and local residents.
2. The BPF has a wide range of members with diverse property and development interests across the country. We have therefore kept our response to high level points rather than recommending individual projects or schemes be prioritised.

London's transport infrastructure

What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

3. London is in a remarkable period of growth, with its population topping 8.6m earlier this year – the highest since its 1939 peak. With this projected to reach 11m by 2050, there will be unprecedented pressure on existing infrastructure. The required infrastructure spend for the capital has been estimated at £1.3 trillion to 2050¹, and finding the necessary funding will present a huge challenge.

Housing

4. The availability and affordability of housing likewise poses a major challenge to London and its inhabitants, and this will continue and potentially worsen with predicted population growth. This will affect a wide range of people, from students to the elderly population. The capital has in recent times led the way in recognising the opportunities to add to housing supply by providing different models of housing and a variety of tenures, and this is warmly welcomed.
5. For example, the Build to Rent sector has taken time to reach a critical mass but is making good progress at adding to housing supply with 7,000 units in the London development pipeline. Whilst central Government has been very supportive in reshaping planning guidance to reflect this new phenomenon of pension fund investment in large-scale rental housing, it has taken time to inform and educate local authority planning officers and politicians about this sector and we would urge all involved to recognise the benefits of attracting investment to areas in this way.
6. There is also an excellent opportunity to plan housing delivery in London hand-in-hand with infrastructure. For example, land freed-up by Network Rail and Transport for London (TfL) is proving attractive for build-to-

¹ 'The Cost of London's Long-Term Infrastructure' Arup, July 2014

BRITISH PROPERTY FEDERATION RESPONSE TO NATIONAL INFRASTRUCTURE COMMISSION



rent development, providing high density quality rental accommodation, near to transport modes, for key workers and other employees. TfL have gone so far as to look at Joint Ventures that will allow them to be part-owners of build-to-rent schemes, and therefore generate income to help fund their other work.

Health services

7. With a rising population, the strain on the city's health services will become increasingly apparent. Already nearly two thirds of London's general practices perform worse than the England average in terms of overall patient satisfaction; three quarters are in need of rebuild or repair; and a third is not compliant with the Disability Discrimination Act². There is a significant amount of private capital available from investors ready to work with the public sector to invest in new premises, but this will require long-term strategic thinking from Clinical Commissioning Groups (CCGs) which are only beginning to adjust to their new roles, and a commitment from Government to increase the revenue funding to allow for improved GP premises.
8. London is likely to face care-related challenges presented by the ageing population over the next twenty years. While the average population of London is younger than the national average, the number of people aged over 65 is set to nearly double by 2029³. Given that there is currently only 28 care beds per 1,000 people aged over 65 in the Greater London area and only 1 bed per 1,000 people aged over 65 in the development pipeline⁴, coupled with the fact that people will on average spend two and a half years of their lives in a care home, this is likely to lead to a severe shortage of suitable residential care homes for the city's population.

Town centres

9. As is the case across the country, the role of London's town centres has changed in recent years. There has been a restructuring of retail habits with online shopping becoming increasingly popular; and in some areas there is a surplus or the wrong type of office space.
10. Rather than allowing high streets to fall into decline, there are opportunities to develop residential growth on high streets; to create affordable and flexible new workplaces (for example through the use of pop-ups); and to ensure visiting town centres becomes a positive and attractive experience. Indeed, some London boroughs are already taking these opportunities and we would encourage the Commission to take into account these examples⁵.

What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

11. Land assembly remains a key challenge in the delivery of these projects, as ownership is often disparate. With much of the land in the hands of local authorities and other public sector bodies such as TfL or Network Rail, they have a key role to play in delivery. Structures such as Development Corporations have proved successful in bringing together land and the key players to coordinate processes. For example, 70% of the land involved in the Old Oak Common HS2 and Crossrail station scheme is in the ownership of public sector bodies and is being brought together in the Old Oak Common Park Royal Development Corporation.

² 'Better Health for London' London Health Commission, October 2014

³ 'Population Growth and Ageing' London Medicine & Healthcare, 2013

⁴ 'UK Healthcare Development Opportunities 2015' Knight Frank, December 2015

⁵ 'Building on Success – London's Town Centres' London Councils, 2015

BRITISH PROPERTY FEDERATION RESPONSE TO NATIONAL INFRASTRUCTURE COMMISSION



12. Some of the most innovative delivery we see is where our members work in partnership with local government through joint ventures and other structures, where public land is invested as part of the partnership arrangement. These can offer local councils valuable income from, and ongoing controls of their public land rather than outright sale to the highest bidder for that land. But many councils remain nervous of best value rules and we believe there needs to be clearer guidance on what is allowed.

- **What innovative funding mechanisms could be considered to support delivery of key schemes?**

13. London in particular has funded the delivery of schemes through a tax on commercial real estate, with Crossrail partly funded by a business rates supplement introduced in 2010, s106 obligations and by the mayoral Community Infrastructure Levy introduced in 2012. Mechanisms such as these can be useful, but have an impact on the viability of schemes and we would be concerned that solely focusing on them and under-utilising innovative mechanisms such as Tax Increment Financing (TIF) would stall delivery.

14. TIF allows local authorities to borrow against future business rates and reinvest this back into local regeneration schemes. TIF-style models have been utilised with great success across the country, such as to partly finance the Nine Elms extension of the Northern Line to Battersea Power Station Nine Elms extension of the Northern Line to Battersea Power station, and in Birmingham's Enterprise Zone on the Paradise Circus scheme, and there are lessons to be learnt from its application in these examples. We would welcome further discussions with the Commission on these examples.

15. The London Finance Commission Report 'Raising the Capital' included a number of comprehensive proposals on this, many of which could be revisited and would allow growth to be further unlocked.

16. We would be pleased to further discuss or amplify any points raised in our response.

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number redacted]

Community and Economic Development

Date: 7 January 2016
Direct dial: [telephone number redacted]
Email: [email redacted]
Please ask for: Greg Macdonald

National Infrastructure Commission
1 Horse Guards Road
London
SW1A 2HQ

Dear Lord Adonis

Call for evidence

I am writing to you on behalf of the Broxbourne Borough Council in response to your recent call for evidence published in November 2015.

Firstly, I would like to thank you for the opportunity to engage in this critical conversation regarding the future growth and prosperity of the nation. Broxbourne is an ambitious Borough that has significant plans for improving prosperity for residents and businesses and, to this end, we are very keen to work with the NIC to turn our ambition into reality. Ambition Broxbourne is the Borough's economic development strategy and mantra that drives partnership working to secure inward investment, nurture business growth, generate quality places and ensure that residents and workers have the skills the economy needs to thrive now and in the future.

Broxbourne Borough Council is a member of both the West Anglia Routes Group (WARG) and the London Stansted Cambridge Consortium, which are associations of public and private sector organisations from along the routes running from Liverpool Street and Stratford through north London into Essex, Hertfordshire and Cambridgeshire. These organisations are working together to promote economic growth including securing timely infrastructure investments. The Council is also represented in the West Anglia Taskforce Working Group. The West Anglia Taskforce will compile an evidence base to support rail infrastructure investment along the London Stansted Cambridge corridor and will report its initial findings to the Government in the summer of 2016.

The Council is currently developing its Local Plan which will set out how Broxbourne will grow and develop to become a more desirable and prosperous place to live, work and visit. It will be a development strategy for the next 15 years. The Plan will provide for homes, jobs, shops, transport and infrastructure - all set alongside the long term protection and improvement of our Green Belt, parks, open spaces and built heritage. An extensive evidence base underpins the preparation of the Local Plan. This has resulted in a detailed assessment of the levels of need within the Borough, counterbalanced against the capacity of the Borough to accommodate growth.

The Borough Council strongly supports the current Crossrail 2 proposals as part of Ambition Broxbourne. In particular, we recognise the critical role it will play in driving local and strategic economic growth and prosperity over the coming years, thereby ensuring that the economy remains competitive and able to nurture and sustain healthy and productive communities. This support has also been confirmed by the Ambition Broxbourne Economic Development Board; a cross sector grouping overseeing and driving the economic development plans for the Borough.

Broxbourne Council is a strong supporter of the regional route of Crossrail 2 because it will add capacity across the network, relieve pressure on key lines, and improve connectivity into and through London, whilst also supporting growth in jobs and homes and regeneration along the London Stansted Cambridge corridor. The Council also strongly supports the proposed provision for four tracking of all or part of the line between Tottenham Hale and Broxbourne to accommodate increasing demand for local services which would bring many benefits and opportunities to the Borough's residents and businesses.

In particular the Council has written separately to the Crossrail 2 team requesting an early opportunity to discuss any available designs in more detail with regard to:

- Broxbourne's ambition of having a new railway station in Turnford between Cheshunt and Broxbourne to support the creation of a new Borough Centre at Brookfield;
- Better connectivity between key strategic development sites and the existing and proposed railway infrastructure including, for example, the proposed commercial development at Park Plaza and the Southbury Loop railway line;
- Programme of level crossing closures;
- Details of stable location near Broxbourne;
- Future of brick bridge over the railway near to Broxbourne Railway Station;
- Proposals for upgrading Waltham Cross, Cheshunt and Broxbourne stations;
- The possibility of developing a more permanent arrangement/local project office to facilitate closer joint working; and
- Financial programming of Crossrail 2

In addition, there is a need for significant improvements to the A10 in supporting growth in housing and employment especially with regards to the planned expansion of Brookfield (to create a new Borough Centre) and Park Plaza (a significant employment allocation). The initial phase of transport modelling is now complete and it was found that there are many capacity constraints at the following locations:

- A10 Great Cambridge Road/ Church Lane
- A10 Great Cambridge Road/ College Road
- A10 Great Cambridge Road/ A121 Winston Churchill Way/ B198 Lieutenant Ellis Way
- M25 J25/ A10 Great Cambridge Road
- A10 Great Cambridge Road/ A1055 Bullsmoor Lane

Further transport modelling is underway to provide more detail and help develop proposals to remedy these issues. Investment in the A10 will also support current planned investment in junction 25 of the M25, help address congestion issues in Enfield, support growth further

north along the A10 corridor in East Hertfordshire District and improve connectivity with Cambridge (with regards to growth in the Life Sciences sector) and Stansted Airport. Therefore we consider that it is critical that these issues and associated improvements are recognised and supported through the NIC. The Council would welcome continued engagement with TfL, Network Rail, Highways England, the National Infrastructure Commission and other key stakeholders to ensure that Crossrail 2 and other strategic infrastructure investment can maximise the potential benefits both locally and nationally.

Overleaf is the Council's more specific response to your call for evidence under your published questions but specific to us.

In conclusion, we are an ambitious Borough and strongly believe that, like other areas within London's hinterland, we play a critical role in its success and have a vital role to play in London's future to ensure it remains a global core city generating and driving national and international economic prosperity. We would be more than happy to host a meeting of the Commission to spotlight how key investments, such as Crossrail 2, will unlock the potential of Broxbourne for the benefit of London and the nation.

If you require further information, or wish to discuss any of the feedback, then please contact Alf Cuffaro on 01992 785539 / alf.cuffaro@broxbourne.gov.uk.

Yours sincerely

[signature redacted]

Greg Macdonald
Director of Community and Economic Development

1. What are the major economic and social challenges facing the Borough of Broxbourne over the next two to three decades?

Housing

The Council has assessed a need for 419 new homes per annum between 2014 and 2031, a total of 7,123 homes. New homes built between 2014 and 2015 would be discounted off this figure but the total need would be around 2,000 new homes in excess of the provision that the Council was planning to provide for prior to the publication of the Government's 2015 household projections. Prior to these projections having been produced, the Council was already faced with making very difficult choices about Green Belt developments. Nevertheless, further review of the Green Belt and of urban capacity has identified sites that could accommodate approximately 6,000 new homes in total. That is the number of new homes that the Council is currently proposing to consult on within the draft Local Plan. This would increase the number of new homes within Broxbourne from 39,800 (2014) to approximately 46,000 in 2031. 6,000 new homes falls short of the identified need and an option could be to meet the full need for in excess of 7,000 new homes. However, at this stage, the Council believes that to meet the need in full would have an unacceptable impact on the aim and purposes of the Green Belt as well as on the ability of Broxbourne's infrastructure to cope. We consider that the redevelopment of stations along the Crossrail 2 route will provide opportunities to innovate and explore new ways of meeting and exceeding this housing requirement.

Population

The current population of the Borough is approximately 96,500. In 2031, the Government predicts that the population will have increased to 109,100. This will be as a result of natural growth in the resident population and a net increase of people moving into the Borough, primarily from London. The Government's population projection is consistent with the number of new homes that the Council is planning for over the Local Plan period.

Employment

It is not proposed that the allocation of land for employment will follow a "needs" based approach. The Council considers that the proposed employment sites should be promoted to maximise the opportunities to meet the employment objective and to diversify the employment base of the Borough. The protection of existing employment areas and the promotion of new ones align closely with Ambition Broxbourne, the Council's economic development strategy, and with the Strategic Economic Plan of the Hertfordshire Local Enterprise Partnership. It is estimated that the new employment opportunities identified to date would result in approximately 7,500 new jobs being created within the Local Plan period. There is a tension between housing and employment growth that we are currently reviewing through the Local Plan with the potential release of strategic sites within the greenbelt.

Shopping and Leisure

The Council has a long standing ambition to reduce the unsustainable leakage of retail expenditure outside the Borough and to provide its residents with better access to high quality shops. The Council's retail needs assessment identifies capacity for between 9,400 m² net and 13,200 m² net new convenience goods floorspace to 2030. It also identifies capacity for between 25,000 m² and 45,000 m² net new comparison goods floorspace to 2030. The proposal for a new Borough Centre at Brookfield will provide additional space.

Schools

Hertfordshire County Council has identified a need for significantly more primary and secondary school floorspace to be provided by 2031. The potential to expand existing schools has been fully assessed and there still remains a need for one new secondary school and up to eight new primary schools within the Local Plan period.

Health

At this stage, a need for two new/extended health care facilities within the Local Plan period has been identified and it is intended that provision will be made accordingly

Green Belt Releases

Urban and brownfield sites cannot meet all of the development and infrastructure needs and provide for sufficient opportunities for the future development of the borough. The nature and location of town centres and railway stations limit the scope for significant additional development in and around such locations without major redevelopment that is not considered practicable or desirable within the lifetime of this Local Plan. Intensification of existing residential areas would adversely impact on the suburban character of much of the Borough and would not provide the means to ensure the delivery of appropriate infrastructure to support development. The potential to reuse employment land for housing is limited given the Council's aspirations and objectives to promote economic growth and development. Alternative options have been carefully considered and in Broxbourne the Council has concluded that planning for the Borough's development needs can only be achieved through the strategic release of some Green Belt land.

Broxbourne currently has some 3,300 Hectares of Metropolitan Green Belt. The Council has prepared a Strategic Green Belt Review that divides the borough into eleven broad areas and looks at how these areas perform in terms of the aim and purposes of the Green Belt. This assessment has highlighted five broad areas that have very limited scope to accommodate development but also identifies six areas that have warranted further consideration in terms of their ability and capacity to accommodate additional development and associated infrastructure. These areas are: the lands between Hoddesdon and the A10; Brookfield and Cheshunt Park; Goffs Oak and Rosedale; Bury Green; the southern A10 Corridor; and lands between Wormley and the A10.

Examination of these areas has resulted in proposals being made to allocate lands to facilitate a number of strategic and edge of urban developments.

Town Centres and the Retail Hierarchy

The borough's town centres remain the hub of community life and their regeneration and improvement are priorities for the Council.

The Hoddesdon Town Centre Strategy was published in 2010 and has been the framework for the redevelopment of the Tower Centre and a range of development, improvement and promotional projects over the last five years. Successive annual actions plans have rolled forward those projects and a full review of the strategy is now proposed. It is anticipated that the following will form the basis of that strategy:

- Further public realm improvements in the High Street and beyond;
- The promotion of small, scale mixed use development sites;
- A gateway development into the town centre at and around Scania House;
- The provision of a mix of day and evening activities;
- Improved access; and
- Protection and enhancement of historic character.

The Waltham Cross Town Centre Strategy was published earlier in 2015. The key projects to be promoted through the Local Plan are:

- Redevelopment of the northern High Street for a mixed use residential and retail development. This would involve the relocation of Homebase and Wickes to Park Plaza North;
- Improved vehicle access through the northern High Street and a range of public realm improvements throughout the High Street and beyond;
- Additional homes in and around the town centre;

Retail Opportunities and the Retail Hierarchy

Opportunities for major new retail and leisure developments to meet the borough's needs within its existing town centres have been examined. However, the only clear opportunity is through the redevelopment of the northern High Street in Waltham Cross. To date, the site has received very limited interest from retailers to the extent that the Town Centre Strategy now proposes a mixed use approach with more limited retail content, an approach that will be reflected in the Local Plan. The only major opportunity for significant new retailing in the borough is at Brookfield. Given the increased retail content and the mix of uses proposed at Brookfield, the Local Plan will include a retail hierarchy that places Brookfield on the same level as Hoddesdon and Waltham Cross town centres. Floorspace levels and content of the centre will, however, be strictly controlled to ensure that it complements the borough's existing centres. Cheshunt Old Pond will remain as a District Centre and a range of neighbourhood and local centres will also be identified within the hierarchy.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in the Borough of Broxbourne - on road, and rail including, but not limited to Crossrail 2?

Transport Infrastructure

The Council is aware that new development will add more pressure to roads and rail services. The only significant new road planned within the Local Plan will be a new link from the existing Brookfield Centre to the Turnford Interchange on the A10. The emphasis will therefore be on managing traffic growth, improving the existing highway network - with a particular focus on the A10 - and on enabling local people to use alternative forms of transport. The Council is particularly supportive of proposals to 4-track the West Anglia mainline and to deliver Crossrail 2 into the Borough to increase rail capacity. As a result the Local Plan is proposing and supporting a range of transport projects as follows:

Road

- Additional junction capacity at the M25 junction 25 through the provision of new on and off slip-roads;
- Improvements to traffic flow through the A10 roundabout linking Lieutenant Ellis Way and Winston Churchill Way;
- The consideration of additional lanes on the A10, as far as possible within the confines of the highway boundary;
- Improvements to traffic flow through the signalized junctions with the A10 at Church Lane and College Road. The future role of these junctions within the wider road network will be examined;
- The northern extension of Brookfield Lane West from the Brookfield Retail Park to the Turnford Interchange on the A10;
- Improvements to the Sun and Hertford Road roundabouts in Hoddesdon;

Rail

- The implementation of Crossrail 2, a new dedicated rail link from Broxbourne to south London. The Council is currently supporting Broxbourne Station as the northern terminus for the majority of Crossrail 2 services;
- The construction of a new station between Cheshunt and Broxbourne at Turnford to support the creation of a new Borough Centre at Brookfield
- Four tracking of the West Anglia mainline to Stanstead Airport;
- Safeguarding of and continued improvements to stations in the borough - including longer platforms, additional parking and improved access;
- Better connectivity between key strategic development sites and the existing and proposed railway infrastructure including, for example, the proposed commercial development at Park Plaza and the Southbury Loop railway line;
- The extension of Oyster card services;
- The replacement of level crossings with appropriate alternatives.

Bus

- The protection of viable bus services throughout the borough;
- Expansion of Waltham Cross bus station in its current location;
- Creation of a new bus station at Brookfield;
- New bus service between High Leigh, Hoddesdon and Broxbourne Station;
- Reinstated bus service to Park Plaza, Waltham Cross.

Walking and Cycling

- Pedestrian and cycle connection from Park Plaza to Waltham Cross town centre;
- Improvements to the New River path including cycle use;
- Promotion of additional off road footpath and cycle links through the borough and connect to and through new developments;
- Greater access to the countryside for pedestrians, cyclists and horse riders
- Promotion of a walking and cycling strategy

The Council will also support transport projects outside the borough where they will ease congestion and provide additional services to residents and businesses within the borough.

Transport related priorities and potential impact

An efficient transport network for all modes of travel will be critical to unlock the full potential of Crossrail 2. In Broxbourne the main priorities are the delivery of Crossrail 2 and improving the capacity along the A10 and its junctions south of the Turnford interchange. Consideration will need to be given to connecting Crossrail 2 to the A10 and the M25 and associated key development sites and existing and proposed communities. In Waltham Cross this presents a particular challenge/ opportunity given that access from the station to the M25 is very problematic and convoluted even though it sits right next to the motorway; a more direct link solution could also address current congestion issues in Enfield.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Opportunities for increased benefits:

- Extend the northern terminus beyond Broxbourne Station
- Construct a new station between Cheshunt and Broxbourne at Turnford to support the creation of a new Borough Centre at Brookfield. Hertfordshire County Council and Broxbourne Borough Council are working together on a business case for the new station.
- Early delivery of four tracking of the West Anglia mainline north of Tottenham Hale to bring forward by a decade much needed new homes and employment opportunities for the region.
- Better connectivity between key strategic development sites and the existing and proposed railway infrastructure including, for example, the proposed commercial development at Park Plaza and the Southbury Loop railway line;
- Improve access to and reduce congestion around stations and improve links to A10 and M25

Opportunities for reducing costs:

- Comprehensive and regular consultations with all stakeholders, especially the key planning authorities and landowners , at each stage of the project
- Programme of level crossing closures to allow for the four-tracking of the West Anglia Main Line
- Reliable and up to date land surveys

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

Possible funding opportunities:

- Recouping some of the uplift on land values from landowners via a Community Infrastructure Level approach
- Private sector contributions (via a form of Business Improvement District type model) as businesses will benefit from having such a major route on their doorstep
- Scope to align the work programme with the investment to make better use of resource and to drive more effective skills development

This needs to be underwritten nationally to create certainty which in itself will facilitate the investment via the mechanism mentioned above

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

Please refer to background paper below under 4)

Useful links to background papers:

- 1) More information regarding Ambition Broxbourne can be accessed at www.ambitionbroxbourne.co.uk
- 2) Broxbourne Local Plan - Please visit <http://www.broxbourne.gov.uk/resident-planning-and-building-planning-policy/development-plan> for more information
- 3) Last year the LSCC published

[*The Strategic Case for Investment in the West Anglia rail route*](#), which sets out:

- a) The huge economic importance of the London-Stansted-Cambridge Corridor;
- b) The large levels of economic and population growth already happening in the corridor;
- c) The role that investment in the West Anglia Line will have in enhancing the labour mobility and economic effectiveness

- 4) Lessons from major rail infrastructure projects

www.nao.org.uk/wp-content/uploads/2014/10/Lessons-from-major-rail-infrastructure-programmes.pdf



BSA - The Business Services Association

Response to the National Infrastructure Commission Consultation

January 2016

Large-scale transport infrastructure improvements in London

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades.

According to Centre for Cities, between 2004-2013, London's population grew faster than any other of the UK's top ten metropolitan areas¹. The Greater London built-up area is nearly five times larger than the next largest of Greater Manchester. This means London has unique infrastructure pressures.

High house prices, coupled with population growth, will likely see more people move to the outskirts of London in search of cheaper dwellings. This development will necessitate improvements to suburban train lines such as Thameslink, Southern and Chiltern Railways in order to cope with increased demand along with a more positive and ambitious residential and mixed use development at and around local stations (both existing and planned). A limited amount of track space already hinders these often overcrowded services, a difficulty that will be exacerbated by a lack of investment and redevelopment.

This picture of steady, rapid growth means London's already strained transport network will face increasing pressure. Crossrail will add 10% capacity to the capital's rail network, however former TFL Commissioner, Sir Peter Hendy, has previously said that it will be 'immediately full' upon opening. This therefore suggests that a second major rail line is needed across London and the BSA welcomes proposals to explore the construction of Crossrail 2.

As with the first Crossrail, refurbished and increased station infrastructure will be a critical component of the project. Stations should be viewed as centres of their community, providing a basis for growth and development. New and improved stations with stable levels of investment can act as a catalyst for both housing and business development. In London especially, proximity to a train station is often a key consideration for someone looking to buy a home. Similarly easy access to transport links often affects a business' location decision. It is imperative that decision-makers take a whole community view of an individual project when judging its merits.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

Crossrail 2, similar to the original Crossrail, offers London an opportunity to add significant capacity to its transport network. As previously mentioned, if Crossrail is full upon opening in 2018, the need for additional capacity will be immediate. The BSA would therefore encourage the development of the Crossrail 2 project as rapidly as is appropriate and necessary. Crossrail 2 will mean the East-West and North-South corridors of London will be served by a high-tech, far reaching and modern rail

¹ <http://www.centreforcities.org/wp-content/uploads/2015/01/15-01-09-Cities-Outlook-2015.pdf>



service. It also creates an opportunity to plan significant new housing above and around many of the proposed new stations which needs to be seen as an integral part of the Crossrail 2 project and not just an afterthought.

Additionally, the Commission should examine closely options for renovating and rebuilding parts of Euston station. As a key hub station, providing access to the North West and Midlands it is already overburdened and in need of investment. Factor in Euston's role as HS2's London hub and proximity to a proposed stop on the Crossrail 2 route and the need to substantially upgrade the station is clear.

Crossrail should not be the only means by which London seeks to expand its intra-city rail service. The capital has already seen new rolling stock introduced on the tube network, such as on the Metropolitan Line, Hammersmith and City Line and Victoria Line in recent years. A number of planned extensions will increase the reach of the tube network, helping create jobs. According to TFL, the Northern Line's Battersea extension will create 24,000 jobs and 18,000 new homes by 2020². The National Infrastructure Commission should explore the possibility of further tube extensions as London continues to grow both in terms of people and square miles. The business case for individual projects and investment, particularly the strategic and economic case, are key to working through prioritisation and economic impact. It is crucial that the business case is cross-agency, able to compare a range of transport and other infrastructure investment.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Starting construction on Crossrail 2 sooner will increase the benefits of job creation and adding capacity. The original Crossrail provides a bountiful source of construction workers, designers and engineers with much needed experience of building a brand new, cross-city, subterranean railway line. Lengthy delays in beginning construction risks this pool of workers dissipating and being committed to alternative projects. Government must offer assurance and clarity as to whether and when Crossrail 2 will be built. As soon as this is offered, businesses can begin the necessary training and upskilling of workers needed to deliver the project.

The BSA urges the government to recognise the benefits of allowing for a seamless transition between major infrastructure projects. Crossrail and Crossrail 2 are an obvious example, being in the same geographical location, requiring the same equipment and demanding the same skills. The National Infrastructure Plan for Skills estimates a shortfall of nearly 400,000 construction and engineering jobs by 2020³. A lack of seamless transition between projects will exacerbate the problem.

The option of phased implementation should be looked at, which could mean that some of the Crossrail 2 infrastructure is not only built, but in operation ahead of 2028. This could allow for increasing London's transport capacity gradually and earlier than if the line was opened all at once. Particular attention should also be paid to development at key nodal points, where a number of major train lines will meet. This in turn should create 'spin-off' regeneration opportunities for housing and businesses to develop in these nodal points where they otherwise wouldn't have.

² <https://tfl.gov.uk/travel-information/improvements-and-projects/northern-line-extension>

³ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/464354/NIP_for_skills_final_web.pdf



4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

Tax Increment Financing (TIF) offers a particularly beneficial structure for funding large-scale transport infrastructure improvements in the capital. This is due to the relatively high-concentration of businesses, particularly around Central London. TIF works by dedicating a proportion of future tax revenues (normally business rates in the case of the UK) for infrastructure and development. The improved connectivity derived from such projects would usually see an increase in business rate revenue, providing a viable option for funding large-scale transport infrastructure. However, given that councils will soon be allowed to keep a portion of their business rate revenues, it will require coordination across all of London's boroughs.

In addition, opportunities for significant residential development at and around new stations and transport interchanges creates an opportunity to secure a mix of capital receipts and new revenue streams to support new transport investment.

As raised in the 2015 Autumn Statement and Spending Review, the pooling of local government pensions funds offers a potentially significant source of funding for infrastructure investment. Pooling the pension funds of London's local authorities, as well as possibly including other bodies such as Transport for London, will allow a greater single pot of investment. Pension funds have the advantage of being able to invest in projects which look longer-term. Infrastructure investment is ideal for pension funds as it offers very low risk due to being underwritten by the government and delivering steady, long-term returns.

In order to support the effective delivery of large-scale transport infrastructure, it is important that an ambitious but realistic time-frame for completion is put in place. A recent National Audit Office report said a project with lengthy timescales negatively affect the continuity, whilst short timescales can make delivery a virtual impossibility⁴.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied?

BSA members have experience of constructing major infrastructure projects across the globe, including, but not limited to, Canada, U.S.A. and Dubai. As with the UK, stability is key to the success of any infrastructure programme, with constructors reliant on the assurance that long-term projects will remain funded and immune from sudden changes or cancellations.

Singapore and Hong-Kong, as major, densely packed metropolises with high demand for transport infrastructure have taken the approach of 'upwards not outwards'. Given the limits on space that exist in both cities, particularly Hong-Kong, projects are being proposed and implemented that will see transport systems make use of space above the city rather than spreading outwards.

⁴ <https://www.nao.org.uk/report/delivering-major-projects-in-government-a-briefing-for-the-committee-of-public-accounts/>

LONDON'S TRANSPORT INFRASTRUCTURE



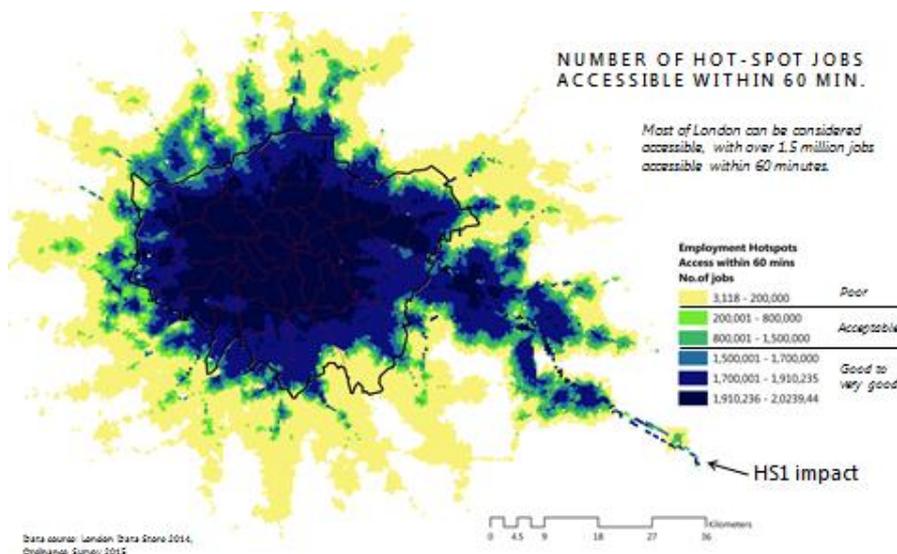
RESPONSE TO NIC CALL FOR EVIDENCE

JANUARY 2016

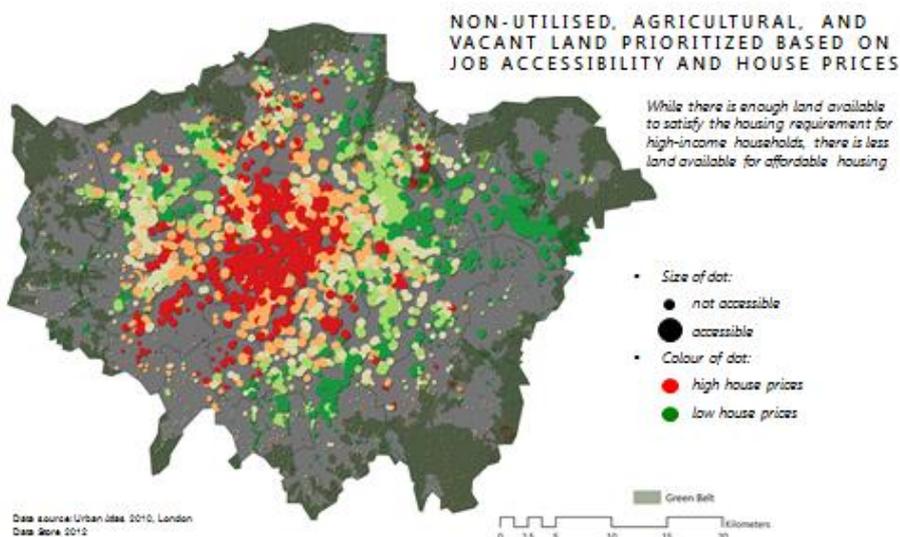
Accessibility to Employment

Current transport accessibility to London employment areas could be considered good for much of the capital, with most areas reachable by current and planned transport infrastructure within 60 minutes.

It should be noted on the diagram adjacent how HS1 and the Javelin services from Kent have had a strong impact on extending job accessibility.



Land Availability



London has a good supply of non-utilised, vacant and agricultural land that could be made available for housing. Much of it is blessed with reasonable (existing or planned) transport connectivity to employment.

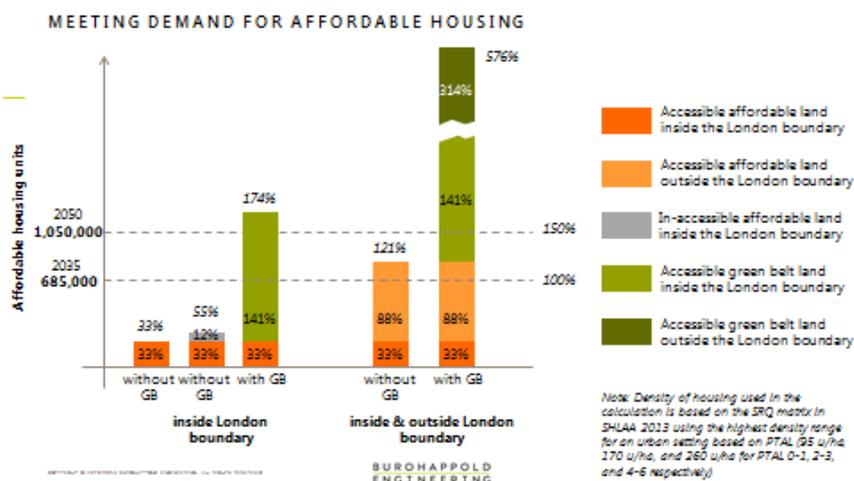
However, high land prices, particularly of sites close to the centre of the city, excludes many of these areas from being suitable for the development of housing that is affordable for those on anything other than

very high salaries or with significant funds to invest.

Meeting the Demand for Affordable Housing

Our modelling has identified the areas that are available for development, accessible to jobs via current and planned transport infrastructure (including Crossrail), and (crucially) affordable.

However, even if fully developed, this land will only meet 33% of the forecast needs for 2035. [NB Our calculations are based on the SRQ matrix in SHLAA 2013, using the highest density range for an urban setting].



Consequently, other options need to be considered if London's competitiveness and position as an economic powerhouse is not going to be compromised.

Examining other parcels of land within the London boundary, a further 12% of needs could be met - if they could be made more accessible to employment by improvements to the transport network.

We have also identified accessible affordable land outside London's boundary that, if made available for homes, could meet the housing needs of the City for the next 20 years. Looking further ahead to 2050, one could consider the transfer of a small amount of accessible greenbelt land for housing needs and this would enable London to accommodate, in an affordable fashion, all of its forecast population demands.

Although releasing greenbelt land is considered a tough political step to take, we believe it could be mitigated by creating equal or greater areas of amenity land within the London boundary (and elsewhere). This could be achieved either by remediating challenging brown-field sites or utilising sites which are likely to remain inaccessible through lack of good transport connectivity.

In summary, we see two key areas to focus on in order for London to continue as a world-leading city, namely:

1. Improvements to transport infrastructure particular linking affordable, available land with employment areas
2. Some future use of green belt land already accessible to major transport routes from central London, mitigated by land swaps to maintain areas of amenity.

We see Crossrail 2 and Cross City Connect – see later – falling into the first category.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London – on road, rail and underground – including, but not limited to Crossrail 2?

BuroHappold Engineering has invested significant time and resources to the examination of infrastructure improvements for London in two key areas:

1. An alternative to the London end of HS2 that will deliver much greater benefit, in terms of inter-regional connectivity, economic regeneration, vital additional capacity and network resilience, whilst requiring **no additional investment cost** than that forecast for the full delivery of the current terminus at Euston.
2. The use of low level bridges to unlock key development sites in East London – with particular emphasis on the priority development area known as 'City in the East'

A. Cross City Connect

The current proposals for linking the planned HS2 rail route into London represent a missed opportunity. This could be the foundation of an effective and integrated modern railway network for the UK. What's more, the proposed terminus station development at Euston not only delivers poor economic returns, but will become ever-more costly and difficult to deliver.

Working with tunnelling experts OTB, BuroHappold Engineering is promoting an alternative route which links with HS2 in the west of London, crosses the city in tunnel and links with HS1 in the east of London. Our Cross City Connect proposal has a single major rail interchange at Waterloo/ Southwark/ Blackfriars with substantially better onward connections into London as well as providing seamless access to Europe.

We have sought to address all of the major issues facing the current proposals for the HS2 terminus at Euston, and fulfil the original intent of HS2 project.

It is important that HS2 hits its ambitious timetable. With the right level of support and decisive commitment, it will be possible to deliver Cross City Connect by 2026 – the current timetable for the partial terminal at Euston promoted by HS2 Ltd. It is certainly possible to deliver the full scheme in advance of HS2 Phase 2 in 2033. From a timing standpoint, this will also enable additional demand to be met at a point when the current Crossrail route nears capacity.

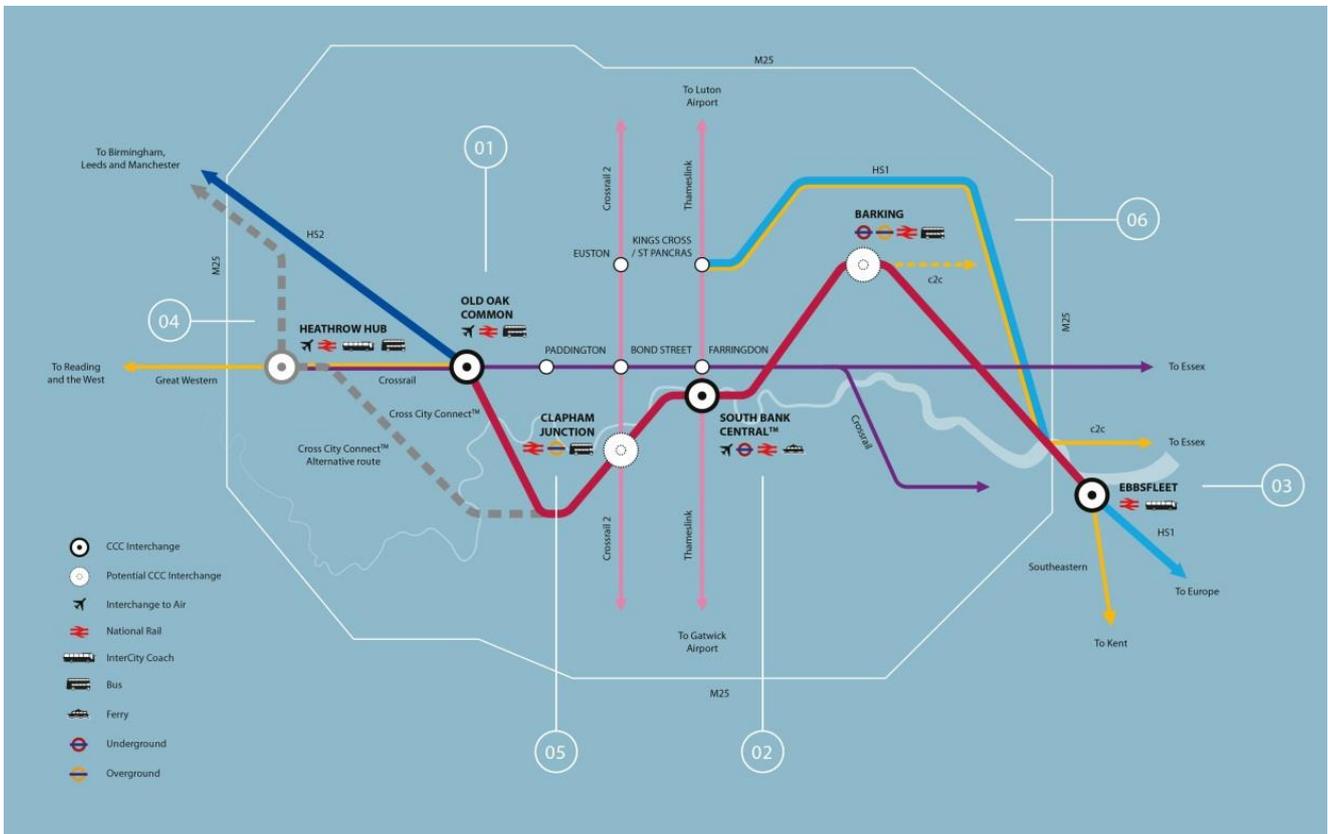
Euston HS2 major issues:

- **Delivery challenges:** Euston requires a massive land-take on a constrained and complex operational site. Adding eleven new HS2 platforms to the challenges of upgrading the underground station, delivering Crossrail 2, and regenerating the local area is a step too far.
- **Spiralling costs:** Land acquisition and construction estimates for the completion of the Euston terminal, from various sources, has risen from the original budget of £1bn to between £4bn and £7bn. Even the current partial build-out proposals tabled are acknowledged to cost well over £2bn –without including the costs of land acquisition nor the work required by others to complete the build-out.
- **London disruption:** Over two decades of misery for those living and working around the area and for commuters using the regional line into the existing station.
- **Connectivity:** Key link to HS1 has been dropped – removing the direct international link and also inter-regional connectivity.
- **Wasted regeneration boost:** To counter rising costs, significant over-site development is planned. Yet Euston is already benefitting from the regeneration around Kings Cross and may gain the benefit of a future Crossrail 2 station. The incremental value delivered by HS2 will be marginal.

The Cross City Connect Solution

We have taken a fresh look at some of the original aims of the HS2 project and drawn on our international experience and upon best-practice in urban infrastructure. Our solution, Cross City Connect (CCC), traverses London in tunnel construction from a link with HS2 in the West to Ebbsfleet Station in the East. It links directly to Europe via HS1, and connects regional services from Essex and Kent to the Thames Valley, the West, Midlands and the North. There will be a new central London hub on the South Bank beneath and between Waterloo and Southwark. It has the capacity to include additional interchanges to enhance regional connectivity and unlock much-needed growth areas.

Working closely with tunnelling specialists OTB, we have defined a route that is **deliverable for no more than the cost of the full delivery of Euston, within current HS2 programme timeframes.**



01 Western Hub - OLD OAK COMMON Option

Our proposal sees Old Oak Common become the western station for the CCC underground rail route.

- Key London HS2 station with connections to Crossrail and Great Western Mainline.
- Further boost to the area's massive regeneration potential
- The opportunity to create an interim terminus for HS2 Phase 1, allowing time for the delivery of a better solution ahead of Phase 2.
- Options to provide additional connectivity to the Bakerloo Line and to overground services at Willesden Junction. (See later section for more information)

02 Central London Interchange - SOUTH BANK CENTRAL™

A new central station that sits beneath and between four existing stations in the heart of London. Initial investigations demonstrate that this is a viable and economically beneficial option.

- Significant benefits in terms of connectivity, network capacity and resilience.
- Provides walking access to Central London.
- Links to 5 underground lines, Thameslink and overground services to the southeast and southwest.
- More efficient dispersal at Waterloo, Southwark / Blackfriars.
- Regeneration boost to the South Bank, and to the Elephant & Castle and Vauxhall Nine Elms opportunity areas.

03 Eastern Hub - EBBSFLEET

Coming to the surface near Rainham, where there is space to service and turn around trains, our route travels to the existing HS1 station at Ebbsfleet as a gateway to both international and inter-regional services.

- Connection to existing HS1 services to Europe.
- Inter-regional trains linking the Thames Valley and the West to Kent (Javelin) and Essex (c2c).
- Boost to the embryonic Ebbsfleet Garden City.
- Ease of access to M25 and other regional motorways.

04-06 Potential CCC Interchanges

Cross City Connect has been designed to enable significant future connectivity and regeneration to be delivered cost-effectively:

- **West London linkage option at HEATHROW HUB:** Depending on the final decision on the location of the future southeast airport, there is also an option to link directly to a new transport hub and employment site at Heathrow. Heathrow Hub could provide a direct rail link to this major international gateway for the south-west, midlands, north and south-east via HS2, GWML, Crossrail and Cross City Connect, as well as easy access from the motorway network. This also has the advantage of space that is more easily developable than Old Oak Common, whose ambitious development plans are complicated by the large amount of live rail infrastructure, including the construction of a new Crossrail Depot.
- **CLAPHAM JUNCTION:** There is the option for an interchange with Crossrail 2 and the many overground services to South London and beyond.
- **BARKING:** There is the potential for a future station to provide impetus to The City in the East area to support London's projected growth.

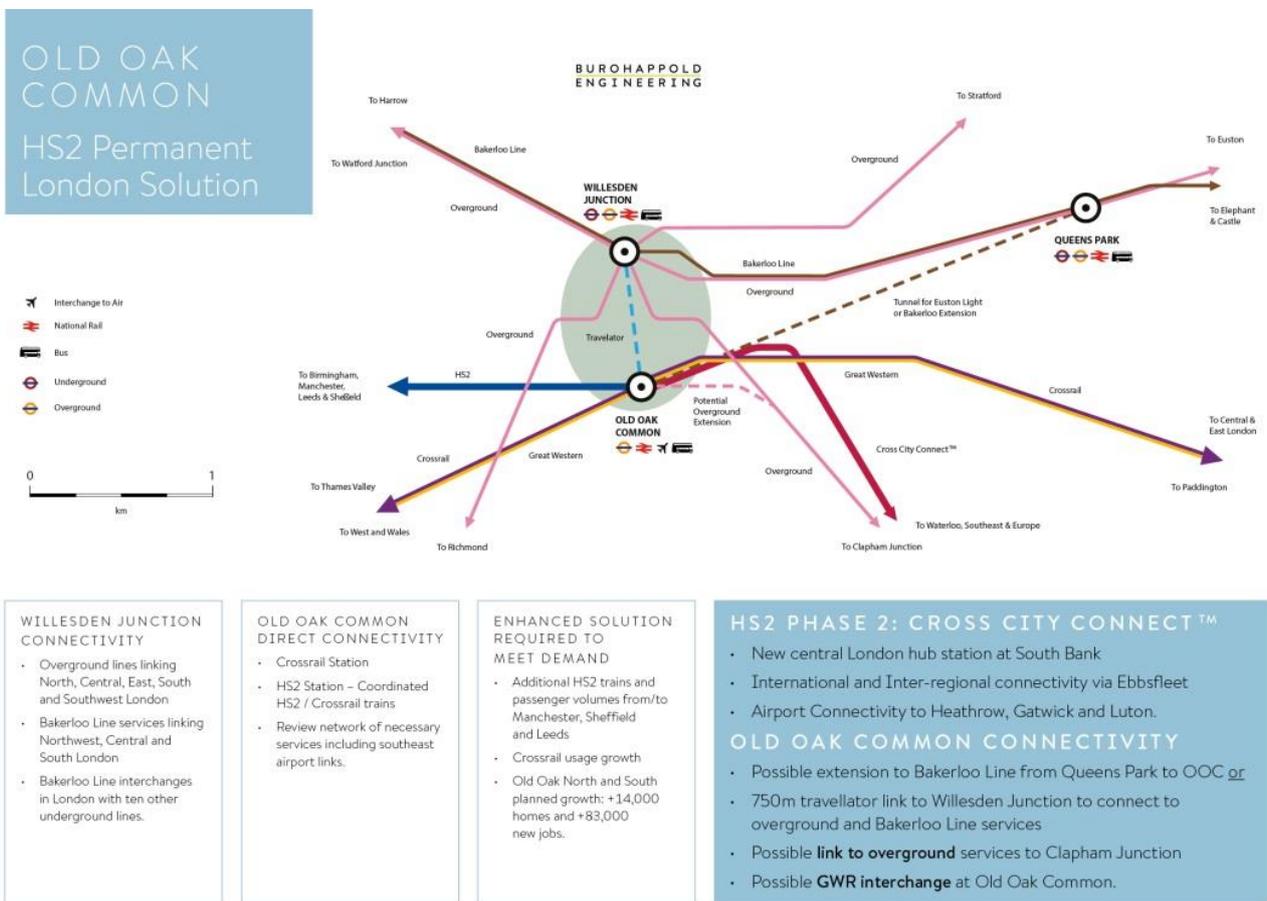
MEETING HS2 PROGRAMME TARGETS

It is important that HS2 hits its ambitious programme milestones. We are advocating a two-phase solution, that aligns exactly with the HS2 programme with an interim terminus at Old Oak Common for HS2 Phase 1, with the full Cross City Connect route open in time ahead of the opening of HS2 Phase 2 in 2033.

A Temporary Terminus at Old Oak Common

Old Oak Common presents a viable *interim* solution for the first phase of HS2:

- HS2 passengers transfer to a waiting Crossrail train for onward transfer to central and eastern London. Passengers can also travel west on Crossrail to Heathrow and the Thames Valley
- Turnaround of HS2 trains using the six HS2 platforms, supplemented by the first section of the CCC tunnel
- Options for increased connectivity via a traveller link to Willesden Junction, or an extension to the Bakerloo Line at Queens Park



Why Old Oak Common won't work as a permanent HS2 Terminus

By the opening of HS2 Phase 2, a new solution will be required to cope with significant additional volumes:

- HS2 passengers travelling to and from Manchester, Sheffield and Leeds.
- Crossrail will experience increased usage from residential and job growth along its route.
- The development of Old Oak Common North and South is predicted to add up to 14,000 homes and bring 80,000 jobs to the area.
- London's population is forecast to increase by close to 2 million additional residents by 2030.

By 2030, Cross City Connect will be ready to carry passengers to its central London interchange and on to Ebbsfleet with connection to HS1 and regional services to Essex and Kent.

Potential impact of Cross City Connect on employment, productivity and housing supply in London and the southeast?

Connectivity, capacity and resilience:

- Greater UK **regional connectivity**, from the northwest, northeast and Midlands to London, and to the southeast and southwest, slashing travel times and giving direct access to new markets.
- **Reduced traffic** volumes on the M25 and the wider southeast motorway network, increasing the efficiency of many business trips and commercial logistics.
- Broader and more **efficient dispersal** at Waterloo / Southwark / Blackfriars with more **effective access** to other services.
- **Reduced pressure on Crossrail** long term via our additional east-west route.
- Direct rail links between our regional cities and key **international transport gateways** via CCC interchanges, providing more efficient access to overseas markets.

Development and regeneration:

- Access to a larger labour pool supports the **enlargement of the London Economic Area**.
- **Supports trends** for flexible working, access to affordable housing and quality of life drivers.
- South Bank Central will **unlock the potential economic value** of the area around **Waterloo and Blackfriars** - A possible southern extension to The City's business and financial services district.
- A significant boost to the key regeneration sites at **Elephant & Castle, Vauxhall and Nine Elms**.
- Possible future station in Barking to drive **regeneration in the Thames Gateway**, providing vital access to employment opportunities and unlocking wider housing plans to the east of London.
- Euston Station and surrounding area can **be redeveloped with nearby Kings Cross** in a structured way without HS2 complexity.

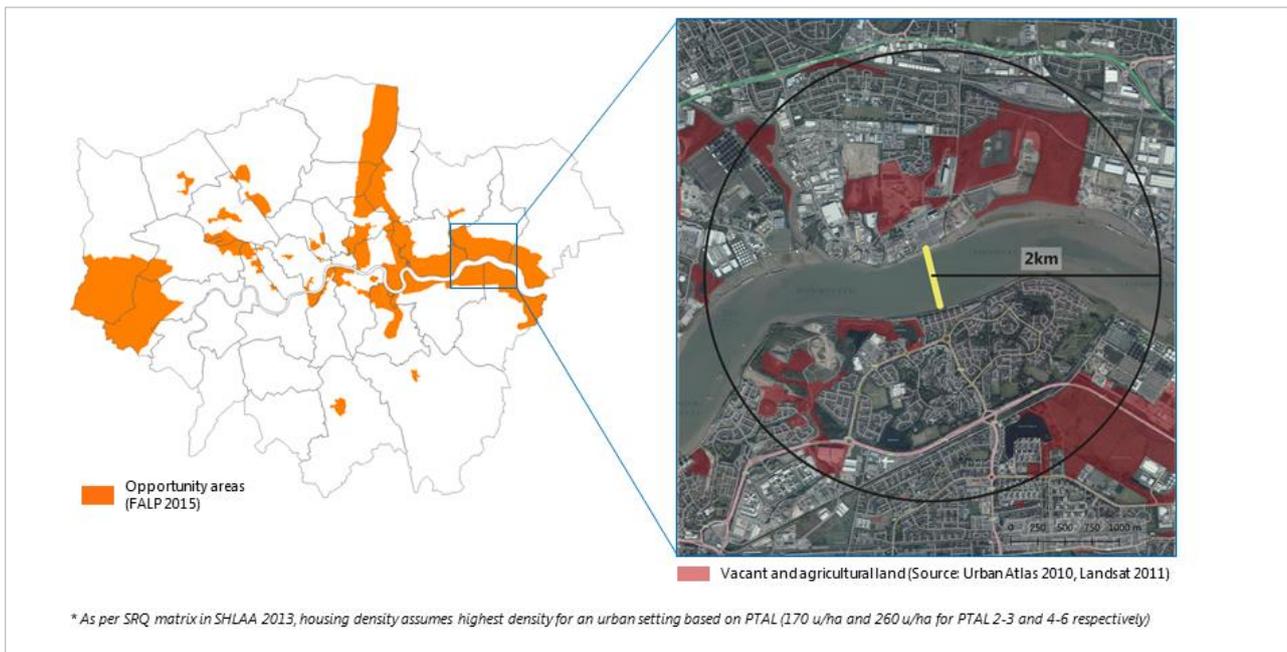
Cost Certainty and Minimal Disruption

- Tunnelling beneath London, following existing rail corridors **manages risk** more efficiently.
- **Through-running** at South Bank Central avoids the need for eleven platforms at Euston's terminus.
- Subterranean stations **minimise land-take** and provide greater opportunity for valuable Over-Site Development. And create significantly lower disruption to working London during construction.
- **Delayed expenditure** of significant public funds to the second phase of the HS2 programme.

B. Low Level Bridges in East London

Working with urban designers Farrells, we have identified how low level bridges will help unlock land for housing development and improve job accessibility for existing and future communities in East London.

As an example, our analysis has shown that within a 2km radius of a potential bridge connecting Thamesmead with Barking Riverside almost 50,000 new homes could be built. A bus connection over the bridge would link Abbey Wood Crossrail Station in the south with the future Barking Riverside overground station in the north and increase job accessibility. It will increase transport network resilience and also enhance access to London's waterfront for the benefit of local residents.



Initial findings have been shared with TfL and the Port of London Authority. More information on our recommendations can be found in a separate BuroHappold / Farrells NIC submission.

How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?

There is an absolute need for the current Green Book methodology for the evaluation of transport infrastructure to be thoroughly revised to take into account the full range of benefits – and also to recognise value-destroyers that major transport infrastructure can represent for an area.

As was highlighted by the HS2 Growth Taskforce, and referenced in the NIC Terms of Reference, a major transport infrastructure investment delivers far greater benefits than greater capacity, reliability and faster journey times; In addition to connecting organisations to new markets, connecting jobs and labour drives significant economic value, and the role of interchanges as anchors of local regeneration has been clearly demonstrated in the case of Kings Cross St Pancras. Full business cases need to be created for all major investments, that enable far greater transparency in prioritisation and decision-making.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

The currently proposed Crossrail 2 tunnel alignment focuses on locations where there is already substantial development (such as Chelsea and Victoria) and where regeneration is already in progress (such as the Euston Cross area). An alignment that runs further east in the city centre, both south and north of the river, would deliver far greater above station and area wide regeneration benefits. Furthermore, greater consideration should be given to locating underground stations for the tunnel section on alignments which give access to several existing stations. Assuming a route further South, an example might be a station between and linking Elephant and Castle Tube and Surface Rail stations.

To the east and north of the Thames one could consider something which links and integrates Tower Hill Tube, Tower Gateway DLR, and Fenchurch St stations. In this way, the new station can both enhance integration between existing services by creating mega hub stations, and spread over-station redevelopment opportunities over a much larger area. The benefits of such strategies would be considerable. Furthermore, whilst the costs of additional access and egress points might be slightly higher, these would be more than off-set by the reduced costs and disturbance at the existing interchange stations due to a more even distribution of interchange passenger loads, reducing the scale of works to increase local capacity.

4. What are the options for the funding, financing and delivery of large-scale infrastructure improvements in London, including Crossrail 2?

In terms of "Financing", recent major tunnelling projects in London, including Crossrail and the Thames Tideway Tunnel, along with developments in infrastructure financing in Canada, have in our view shown the way forward. Crossrail shows that construction risk, when going underground, is not as great as thought. Indeed, it can now be argued that staying at the surface is far more risky than going underground. Expected return from investors directly correlates to risk. We have seen with Thames Tideway that cost of capital on large tunnelling projects need not be excessively high. What is more, we have a growing pool of funds held by pensions. In Canada this has been mobilised to deliver much needed infrastructure via the major pension investment funds. Pension funds are the perfect vehicle for infrastructure funding of this type, not only creating stable long term returns for those depending on the pensions, but ensuring that contributions made today are being mobilised for the benefit of those making those contributions. A rare win:win.

With such a privately financed structure, one can move to "Delivery" via a public private project company model. If correctly structured in terms of risk allocation, this can deliver significant benefits in terms of ongoing innovation and whole life costing disciplines, while ensuring appropriate controls are retained within the public sector, thus ensuring a company that focuses on its specific business, yet operates within a structure that considers wider social and economic issues.

- What is an appropriate local and regional contribution – given the potential distribution of benefits to business, residents, transport users and the wider economy – and how could this be achieved?

It is clear that investment in transport infrastructure has wide and decisive regional catalytic impacts, enabling residents of both London and the peripheral commuting counties in the South East and Eastern Regions to access employment opportunities in the Greater London area. For example, it is clear that Crossrail 1 will deliver significant economic benefit to the commuting residents of Berkshire, Essex. What's more, if the proposed diversion of western Crossrail services to the WCML goes ahead, Bedfordshire, Hertfordshire and Buckinghamshire residents will also benefit, largely at the expense of London business ratepayers. One could also argue that as workers continue to move further out of London to find homes they can afford, such upfront match investment in transport infrastructure is essential if large employers in central London are to access one of the world's most cosmopolitan, diverse and skilled workforces – due to the many reasons cited in the call for evidence.

Therefore, we recommend that the South East and Eastern Regions are given utmost consideration when contemplating further infrastructure investment in London. As co-beneficiaries, and potential co-funders, of such infrastructure it is

important that their role is recognised in helping London deliver its strategic goals of affordable family housing and a competitive labour supply.

While we understand that there are fora for such engagement in decision making already in place, we think that their role and powers will need to be reviewed given the challenges faced. For example, many of the newly announced City Regions designated as part of the 'Northern Hub' policy constitute an urban city plus the peripheral and commuter hinterland in which significant parts of the labour market reside. These City regions will be given significant powers over infrastructure investment and service level agreements that London does not have over activities in the South East and Eastern Region. This presents a potential comparative disadvantage for London in the planning and funding of such infrastructure.

What is clear is that existing funding models will be insufficient for continued investment of the scale London has witnessed in the last few years. While the Crossrail 1 funding model has been lauded as particularly successful in enabling government to recoup some of the costs from beneficiaries in central London (employers and developers), the next stage will require this pool of beneficiaries to be enlarged further, given the scale of investment required. So, who are these potential additional beneficiaries? The Crossrail 1 experience has shown that they include a far more varied and geographically wider group than initially assumed: residents and employers in outlying commuter counties; speculative buy to let landlords near proposed stations; developers both in London and in outlying commuter areas; and property in London near stations who have seen phenomenally capital gains since the project's route was first announced.

There is an ever-increasing suite of mechanisms available to local authorities to capture value generation from new development – s106, CIL, TIF, and Incremental Business Rates. However, these do not work well when dealing with intra-regional infrastructure developments, such as the proposed Crossrail 2 and other infrastructure benefiting the capital's economic hinterland, or in capturing any capital gains. We recommend that further research is commissioned to investigate the innovative options available to London to both capture some of this capital wealth generation (potentially building on the recently published work of the Centre for Cities "*Beyond Business Rates: Incentivising cities to grow*") and also ensuring enhanced contribution from beneficiary counties on London's periphery.

The new profusion of Local Enterprises Partnerships is, for example, one way that London could seek to ensure that the funding of infrastructure is fair to all beneficiaries – as shown recently by the Hertfordshire LEP's funding contribution to the Metropolitan Underground works at Watford. We should recognise, however, that such arrangements will lead to local calls from the counties for greater scrutiny over such spending decisions, with a widely held assumption that transport services are often skewed in favour of the capital's requirements over these commuting counties. Such discussion over service level agreements and operations is best at the regional level, potentially using the regional fora discussed earlier.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

- Construction of rail stations underground is now well-established – eg The recent underground Magenta station in Paris between Paris Nord and Paris Est stations.
- Terminus stations in cities have been rejected in favour of through stations in a number of major European cities including Berlin, Vienna, Stuttgart and Marseilles.....and historically in Brussels, the old north and south stations were connected to make a through line.
- The 7 Line Subway Extension in New York is being funded with NYC funds from bond sales to be repaid with property tax revenues from development in the area around the new station (the Hudson Yards). Other transport projects in the US are similarly financed (e.g. Atlanta's Belt Line)..
- Hong Kong's MTR are developing real estate and transport themselves.
- BRT as a potential 'cheaper' option to connect areas of London that are poorly served by public transport. New York serves as a good example of how they are trying to upgrade their bus network to areas that are less served.

LONDON'S TRANSPORT INFRASTRUCTURE:
RESPONSE TO NIC CALL FOR EVIDENCE

CO N T A C T

Andrew Comer, Partner

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BSA - The Business Services Association

Response to the National Infrastructure Commission Consultation

January 2016

Large-scale transport infrastructure improvements in London

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades.

According to Centre for Cities, between 2004-2013, London's population grew faster than any other of the UK's top ten metropolitan areas¹. The Greater London built-up area is nearly five times larger than the next largest of Greater Manchester. This means London has unique infrastructure pressures.

High house prices, coupled with population growth, will likely see more people move to the outskirts of London in search of cheaper dwellings. This development will necessitate improvements to suburban train lines such as Thameslink, Southern and Chiltern Railways in order to cope with increased demand along with a more positive and ambitious residential and mixed use development at and around local stations (both existing and planned). A limited amount of track space already hinders these often overcrowded services, a difficulty that will be exacerbated by a lack of investment and redevelopment.

This picture of steady, rapid growth means London's already strained transport network will face increasing pressure. Crossrail will add 10% capacity to the capital's rail network, however former TFL Commissioner, Sir Peter Hendy, has previously said that it will be 'immediately full' upon opening. This therefore suggests that a second major rail line is needed across London and the BSA welcomes proposals to explore the construction of Crossrail 2.

As with the first Crossrail, refurbished and increased station infrastructure will be a critical component of the project. Stations should be viewed as centres of their community, providing a basis for growth and development. New and improved stations with stable levels of investment can act as a catalyst for both housing and business development. In London especially, proximity to a train station is often a key consideration for someone looking to buy a home. Similarly easy access to transport links often affects a business' location decision. It is imperative that decision-makers take a whole community view of an individual project when judging its merits.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

Crossrail 2, similar to the original Crossrail, offers London an opportunity to add significant capacity to its transport network. As previously mentioned, if Crossrail is full upon opening in 2018, the need for additional capacity will be immediate. The BSA would therefore encourage the development of the Crossrail 2 project as rapidly as is appropriate and necessary. Crossrail 2 will mean the East-West and North-South corridors of London will be served by a high-tech, far reaching and modern rail

¹ <http://www.centreforcities.org/wp-content/uploads/2015/01/15-01-09-Cities-Outlook-2015.pdf>



service. It also creates an opportunity to plan significant new housing above and around many of the proposed new stations which needs to be seen as an integral part of the Crossrail 2 project and not just an afterthought.

Additionally, the Commission should examine closely options for renovating and rebuilding parts of Euston station. As a key hub station, providing access to the North West and Midlands it is already overburdened and in need of investment. Factor in Euston's role as HS2's London hub and proximity to a proposed stop on the Crossrail 2 route and the need to substantially upgrade the station is clear.

Crossrail should not be the only means by which London seeks to expand its intra-city rail service. The capital has already seen new rolling stock introduced on the tube network, such as on the Metropolitan Line, Hammersmith and City Line and Victoria Line in recent years. A number of planned extensions will increase the reach of the tube network, helping create jobs. According to TFL, the Northern Line's Battersea extension will create 24,000 jobs and 18,000 new homes by 2020². The National Infrastructure Commission should explore the possibility of further tube extensions as London continues to grow both in terms of people and square miles. The business case for individual projects and investment, particularly the strategic and economic case, are key to working through prioritisation and economic impact. It is crucial that the business case is cross-agency, able to compare a range of transport and other infrastructure investment.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Starting construction on Crossrail 2 sooner will increase the benefits of job creation and adding capacity. The original Crossrail provides a bountiful source of construction workers, designers and engineers with much needed experience of building a brand new, cross-city, subterranean railway line. Lengthy delays in beginning construction risks this pool of workers dissipating and being committed to alternative projects. Government must offer assurance and clarity as to whether and when Crossrail 2 will be built. As soon as this is offered, businesses can begin the necessary training and upskilling of workers needed to deliver the project.

The BSA urges the government to recognise the benefits of allowing for a seamless transition between major infrastructure projects. Crossrail and Crossrail 2 are an obvious example, being in the same geographical location, requiring the same equipment and demanding the same skills. The National Infrastructure Plan for Skills estimates a shortfall of nearly 400,000 construction and engineering jobs by 2020³. A lack of seamless transition between projects will exacerbate the problem.

The option of phased implementation should be looked at, which could mean that some of the Crossrail 2 infrastructure is not only built, but in operation ahead of 2028. This could allow for increasing London's transport capacity gradually and earlier than if the line was opened all at once. Particular attention should also be paid to development at key nodal points, where a number of major train lines will meet. This in turn should create 'spin-off' regeneration opportunities for housing and businesses to develop in these nodal points where they otherwise wouldn't have.

² <https://tfl.gov.uk/travel-information/improvements-and-projects/northern-line-extension>

³ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/464354/NIP_for_skills_final_web.pdf



4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

Tax Increment Financing (TIF) offers a particularly beneficial structure for funding large-scale transport infrastructure improvements in the capital. This is due to the relatively high-concentration of businesses, particularly around Central London. TIF works by dedicating a proportion of future tax revenues (normally business rates in the case of the UK) for infrastructure and development. The improved connectivity derived from such projects would usually see an increase in business rate revenue, providing a viable option for funding large-scale transport infrastructure. However, given that councils will soon be allowed to keep a portion of their business rate revenues, it will require coordination across all of London's boroughs.

In addition, opportunities for significant residential development at and around new stations and transport interchanges creates an opportunity to secure a mix of capital receipts and new revenue streams to support new transport investment.

As raised in the 2015 Autumn Statement and Spending Review, the pooling of local government pensions funds offers a potentially significant source of funding for infrastructure investment. Pooling the pension funds of London's local authorities, as well as possibly including other bodies such as Transport for London, will allow a greater single pot of investment. Pension funds have the advantage of being able to invest in projects which look longer-term. Infrastructure investment is ideal for pension funds as it offers very low risk due to being underwritten by the government and delivering steady, long-term returns.

In order to support the effective delivery of large-scale transport infrastructure, it is important that an ambitious but realistic time-frame for completion is put in place. A recent National Audit Office report said a project with lengthy timescales negatively affect the continuity, whilst short timescales can make delivery a virtual impossibility⁴.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied?

BSA members have experience of constructing major infrastructure projects across the globe, including, but not limited to, Canada, U.S.A. and Dubai. As with the UK, stability is key to the success of any infrastructure programme, with constructors reliant on the assurance that long-term projects will remain funded and immune from sudden changes or cancellations.

Singapore and Hong-Kong, as major, densely packed metropolises with high demand for transport infrastructure have taken the approach of 'upwards not outwards'. Given the limits on space that exist in both cities, particularly Hong-Kong, projects are being proposed and implemented that will see transport systems make use of space above the city rather than spreading outwards.

⁴ <https://www.nao.org.uk/report/delivering-major-projects-in-government-a-briefing-for-the-committee-of-public-accounts/>

Large-scale transport infrastructure improvements in London

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

London is likely to continue to face issues associated with accommodating increasing population and in-commuting. Important among these will be the issue of air pollution.

Transport for London has reported that the number of trips made in London in 2013 averaged 26.1 million per day, an increase of 1.2 per cent over the previous year (including residents and non-residents).

Within this, there are a number of important trends. Over the 10-year period from 2003-2013, total trips increased by 11.4 per cent, with rail increasing by 52.3 per cent, Underground /DLR by 32 per cent and cycling by 53.9 per cent. By contrast, car driver trips decreased by 12.7 per cent over the same period. [<http://content.tfl.gov.uk/travel-in-london-report-7.pdf>]

Despite the fall in car numbers, legal compliance with air quality limits remains a very significant problem. The national Air Quality Strategy, published by DEFRA in 2015 [https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/486636/aq-plan-2015-overview-document.pdf] reports that the Greater London urban area currently has the highest NO₂ exceedance in the UK and that the capital's transport networks and construction activity means the task of reducing NO_x emissions, and NO₂ concentrations, is the most challenging in the country.

The London Mayor is taking forward a package of measures to bring London into compliance with NO₂ limit levels in the shortest possible time. This includes reducing emissions from buses and taxis, and introducing an Ultra Low Emissions Zone from 2020. Despite these initiatives, air quality is not expected to be compliant with legal standards before 2025.

In sum, new transport infrastructure and initiatives will be needed to move increasing numbers of people around greater London while actively reducing air pollution and its impact on human health. Increased demand for rail, Underground and cycling together with a marked fall in car driving all have the potential to help achieve this goal.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

- How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?

- What might their potential impact be on employment, productivity and housing supply in London and the southeast?

It is vital that investment priorities are clearly aligned with wider policy objectives and legal requirements. In keeping with our response to Q1, potential schemes should be prioritised with clear regard to legal responsibility concerned air quality and long term trends away from car use and toward public transport. In this regard, we are concerned by plans for further Thames crossing schemes based on road transport which stand to break positive trends away from car reliance and increase local air pollution concerns. More detail is given in our response to the river crossings consultation in 2014

[http://bettertransport.org.uk/sites/default/files/research-files/CfBT_TfL_River_Crossings_Consultation_Sep2014_FINAL.pdf].

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

-

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

- **What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?**

- **What innovative funding mechanisms could be considered to support delivery of key schemes?**

-

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

-

Open Consultation

National Infrastructure Commission call for evidence

London's transport infrastructure

The National Infrastructure Commission is a new, independent body which will look at long term infrastructure needs and provide impartial advice to ministers and Parliament. Before next year's budget they will publish a report on *large scale transport infrastructure improvements in London*.

You are strongly encouraged to provide details of the evidence and data to support your arguments to enable the Commission to understand more fully the basis on which conclusions have been reached.

Please note, the Commission will not be considering questions relating to airport capacity. The Airports Commission has already examined this issue in detail.

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

<p><u>Reduce journey numbers</u></p>

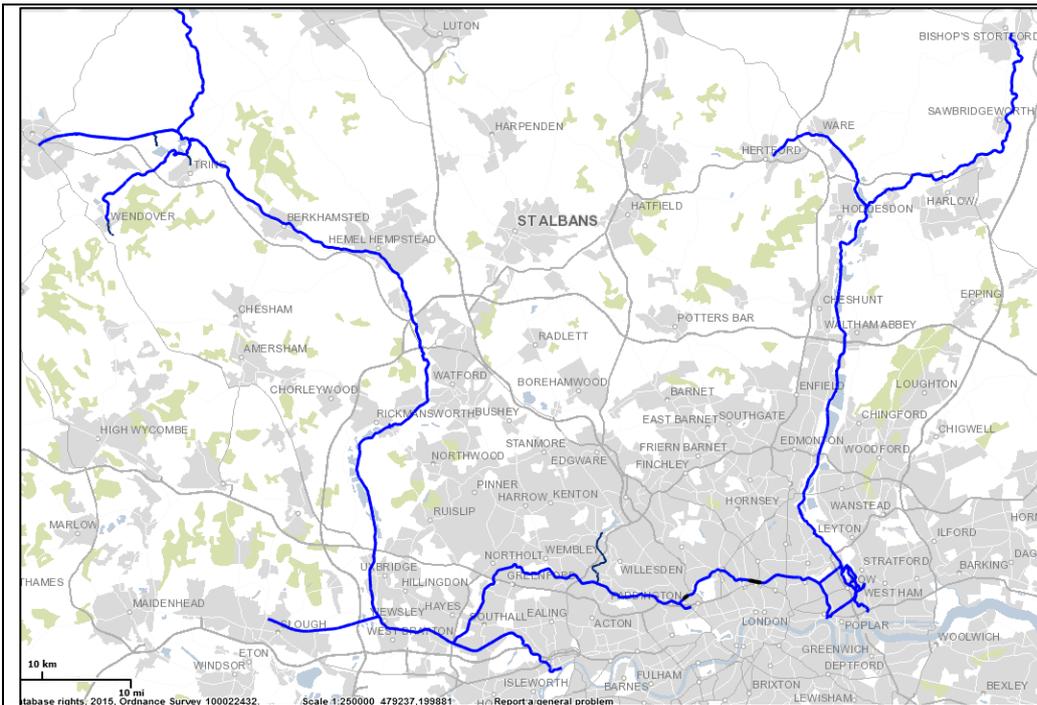
<p>What further measures can be taken to better integrate land uses (residential, employment, education, health etc) to reduce the need to travel, including use of technology and flexible working.</p>
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<p><u>Cycle-friendly public transport</u></p>

<p>Consider further how trains and buses can better accommodate carriage of bikes as a means of continuing journeys with a view to relieving peak pressures on rail and road.</p>

<p><u>Sustainable Travel</u></p>

<p>Canal and river towpaths offer attractive traffic-free routes for people to travel to work, school and for leisure. Canal & River Trust's has around 100 miles of waterways and towpaths in the Capital and surrounding areas, including around 65 miles within the fifteen London boroughs north of the Thames. These waterways connect the Lee Valley, Central London and the West (see map below)</p>



The Trust's Waterways in the London Area

Waterways support London's growth, connecting people to key employment, opportunity and visitor destinations such as:

- London Docklands
- Meridian Water Enfield
- Tottenham Hale
- Stratford and the Queen Elizabeth Olympic Park
- Kings Cross
- Paddington Basin / Little Venice
- Old Oak Common & Park Royal MDC
- Southall Gas Works
- Crossrail western extension – Hanwell, Southall, Hayes, West Drayton, Iver, Langley, Slough

Cleaner Air for London

Along with other measures, towpaths contribute to reducing vehicular congestion and air pollution within London. For example, the Environmental Audit Committee's Action on Air Quality Report mentions a broader role for LEPs and Regional Growth Funds to achieve cleaner air quality alongside their jobs and growth targets.

Value for Money

The past 15 years has seen significant growth in popularity and use of London towpaths, in particular on the Regents Canal which serves Central London and the City. Some London towpaths are expected to receive investment from the Mayor of London's Cycling Vision as Quietways. However, the Regents Canal (expected to remain the most heavily used) and the River Lee Navigation are excluded – both could be improved significantly for commuter and local journeys on foot and bike.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London – on road, rail and underground – including, but not limited to Crossrail 2?

Adequate cycle storage for peak time travel on public transport.

Consider interchange facilities at public transport hubs for connections to nearby canal towpath routes for walking and cycling, including provision of appropriate cycle parking, cycle maintenance services, lockers, toilets and showers to encourage onward bicycle journeys.

Information on links to walking & cycling routes for leisure passengers should be made more easily available on public transport – for example for journeys made one way by train and return by foot or bicycle along towpaths.

2a. How should they be prioritised, taking account of their response to London’s strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?

No comments

2b. What might their potential impact be on employment, productivity and housing supply in London and the southeast?

No comments

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Freight Transport by Water

The Trust believes that the environmental impact of the construction phase of Crossrail 2 can be reduced by taking advantage of the River Lee Navigation (a Commercial Waterway).

The Trust has engaged in preliminary conversations with the Crossrail 2 team regarding the opportunity of using the River Lee Navigation as a freight transport corridor to move materials (both construction materials and waste) from the tunnel portal in the Tottenham area out onto the River Thames, via a transfer facility that could be constructed in the Bow area of East London. We would very much like to continue this dialogue and would suggest that the NIC/Crossrail 2 team commission a feasibility study to look at this (and other) options in more detail. Our experience of projects of this nature in the past has led us to conclude that this feasibility study work needs to be undertaken several years ahead of the proposed start of construction.

Safe and sustainable routes to work

We believe that part of a sustainable transport policy during the construction phase of Crossrail 2 should include the provision safe and sustainable routes to work – providing opportunities for the workforce to move away from cars and trains and over to walking and cycling to work. The towpaths running along waterways of London could be part of an integrated Crossrail 2 workforce

transport network and we would like to work with the NIC/Crossrail 2 to develop this concept further.

Utility Corridors

Beneath many of the Trust's London towpaths there are buried utilities such as fibre optic and high voltage electricity cables. These take advantage of direct and straightforward routes around and through the Capital. The Trust believes that further development of these utility corridors could be undertaken to allow improved communications and/or asset resilience.

Energy Production

The water flowing through the Trust's 3200 kilometres of waterways (of which around 100km which pass through and around London) contains enough thermal energy to produce approximately 640 MW of energy. This has attracted a number of businesses which now utilise this low carbon source to heat and cool their buildings. DECC to have acknowledged this potential in their Heat Map which includes a specific canal layer <http://tools.decc.gov.uk/nationalheatmap/>. The energy is extracted using water sourced heat pumps which are very efficient compared to conventional forms of heating and cooling. These efficiency improvements will help reduce the electricity demand and assist in balancing electricity supply. In order to realise this benefit the Trust would urge the NIC to recommend that the renewable heat incentive (RHI) is retained so that this nascent technology can be deployed more widely and possibly assist with the energy requirements of Crossrail 2.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

No comments

4a. What is an appropriate local and regional contribution – given the potential distribution of benefits to business, residents, transport users and the wider economy – and how could this be achieved?

No comments

4b. What innovative funding mechanisms could be considered to support delivery of key schemes?

No comments

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

No comments

Response by Canary Wharf Group to National Infrastructure Commission

0 Summary

0.1 Canary Wharf Group Limited (CWG) is pleased to respond to the call for evidence from the National Infrastructure Commission (NIC) on London's future transport infrastructure. The key points are:

- According to the London Plan, London's housing growth will be primarily focused in east and south east London, highlighting the need for additional transport infrastructure to improve access to areas, particularly those adjacent to the Thames on both sides of the river
- Even with planned rail improvements, there is still a need to enhance orbital rail routes/capacity as a means of providing a better alternative to road travel across Greater London as a whole and also reducing pressure at Central London termini and interchanges
- Crossrail 2 is supported as a means of providing additional rail capacity, but in its original north east – south west orientation.
- The costs of Crossrail 2 could be reduced by:
 - reviewing the alignment in south west London and restricting tunnelling to the section north of Clapham Junction
- The benefits of Crossrail 2 could be enhanced by:
 - extending services in the north to Stansted
 - providing a new eastern branch to serve London Riverside
- Other priorities for transport investment include:
 - New road/rail river crossings east of Tower Bridge
 - Improved orbital and radial road capacity
 - Extension of Crossrail 1 to Ebbsfleet, subject to further capacity studies and provision of at least 30 trains per hour through the Isle of Dogs
 - Further extension of the Bakerloo Line (over and above the recently announced extension to Lewisham) to include a route through Surrey Quays, the Isle of Dogs (and potentially beyond to open up areas adjoining the Thames including the Greenwich Peninsula and Charlton Riverside for housing growth and other development), linking a string of Opportunity Areas identified in the London Plan 2015
 - ensuring road capacity and accessibility meets the needs of essential servicing / delivery vehicles, buses and cyclists.

0.2 CWG would welcome further discussion with the NIC on the ideas presented in this response.

1 Introduction

- 1.1 This evidence for the National Infrastructure Commission (NIC) on London's future transport infrastructure is prepared by Canary Wharf Group Limited (CWG).
- 1.2 CWG is keen to ensure that over the next 30+ years existing and future transport infrastructure will support the Greater London Authority's ("GLA") and Transport for London's ("TfL") objectives as set out in the London Infrastructure Plan 2050: to ensure the foundations for London's continued success as a Global City; to help house a growing London; to support a better, not just bigger, London; and to innovate to develop a transport system of tomorrow.
- 1.3 CWG feel that infrastructure investment should facilitate the maximisation of development potential in the Opportunity Areas (OAs) identified in the London Plan 2015, in particular those in east and south east London.
- 1.4 We recognise that the Commission will not consider opportunities related to airport expansion, and have borne this in mind in preparing this response. We note though that when a decision is made, important choices will need to be made on the locations of transport infrastructure, to ensure flexible services are provided serving all of London's airports and potential expansion locations.
- 1.5 We note that the Commission is not currently tasked with looking at ways to reduce the need for major capital projects by better use of existing and future capacity. Technology and other measures should be explored to achieve better use of infrastructure capacity.
- 1.6 The response is set out as follows:
 - **Section 2** – London and its hinterland – major economic and social challenges
 - **Section 3**- Strategic large-scale transport options, including commentary on potential funding
 - **Section 4** - Crossrail 2 - improving the cost: benefit ratio.

2 London and its Hinterland - Major Social and Economic Challenges

High population and employment growth

- 2.1 The key transport infrastructure challenges, and underlying trends such as population and employment growth have been researched by the GLA and TfL and other interest groups, notably within the London Plan 2015. The GLA predict that London's population could grow from 8.6 million in 2015 to potentially 13.4 million by 2050. The GLA also forecast that the number of jobs within London could increase from 4.9 million in 2015 to 6.3 million by 2041.
- 2.2 Actual growth in travel has also been greater than the forecasts in the Mayor's Transport Strategy (source: GLA London Infrastructure Plan: Transport Supporting Paper (2014)). This further highlights the need to proactively plan and implement substantial improvements to transport infrastructure, particularly to accommodate growth in public transport trips.
- 2.3 TfL estimates public transport trips could increase by up to 60% by 2050, based on projected population growth, with continuing trend mode shift from car use given increasingly dense patterns of development. This underlines the need for further major investment in public transport.

Housing demand

- 2.4 London's forecast population growth will need 49,000 additional homes each year, but only 30,000 are being completed each year. The Future of London's London 2050 workshop concluded "supply of housing [is] an enabling tool for economic growth in London. Housing, taken as a piece of infrastructure, is one of the most (if not the most) important risks to London's economy." Housing demand into the foreseeable future exceeds supply, resulting in high housing costs. Effective transport investment can help by improving connectivity with lower cost areas in London's hinterland, opening up new areas for development and facilitating densification within London.

Ageing population

- 2.5 The London Plan estimates that the number of people over 64 is projected to increase by 64% (nearly 580,000) to reach 1.49 million by 2036. The over 90s are expected to grow in number over the same period, by 89,000. This will require further investment in accessible public transport including flexible demand responsive services and use of vehicles with wheelchair access.

Reducing commuting times

- 2.6 London has the longest average commute time in the UK - 56 minutes per trip each day. Lower value housing areas located along the radial road and main line routes out of London are increasingly being used by commuters, leading to transport infrastructure capacity constraints.
- 2.7 Transport investment should increase capacity on strategic routes, particularly underground and rail routes and this should be combined with high density development around stations. It should improve service reliability, reduce overall journey times, reduce congestion at terminal stations and improve interchange opportunities outside Central London.

Transit-oriented development

- 2.8 London needs higher density development around public transport nodes and increased public transport accessibility to redevelopment and regeneration areas. The focus for investment should be to unlock and raise the cap on development potential, especially within the Opportunity Areas and Areas for Intensification identified in the London Plan, potentially generating greater surplus value to help fund infrastructure delivery.

3 Strategic Large-Scale Transport Options

Priority Rail and Underground Schemes

- 3.1 Key rail and underground network interventions should improve capacity and connectivity within London and on radial links with its hinterland. These should be combined with strategic interchanges between radial and orbital routes to reduce pressure at terminal stations. National Rail's corridor upgrades as shown in the 2050 London Infrastructure Plan should be a priority for funding.
- 3.2 CWG supports Crossrail 2 in principle, as it opens up important connections needed to allow London to grow. However the planned scheme does not tackle the transport challenges outside central London/West End, nor does it address London's Opportunity Areas very well. Therefore, it needs to be complemented by new rail capacity to improve connectivity between and to other key centres of employment and major new development – the City, Canary Wharf (incl. Poplar and Isle of Dogs), City in the East/Tilbury Port, Euston/Kings Cross/St Pancras and Old Oak Common/Wembley.
- 3.3 CWG ask that the Commission consider in more detail the following rail, DLR and underground improvements that meet the strategic objectives by improving both accessibility and connectivity. Prioritisation should be given to schemes which provide improved connectivity, in particular reliability and speed of journeys and which unlock the delivery of housing and jobs within London:
- Crossrail 1
 - provide a new link to the West Coast Mainline from Old Oak Common
 - extend services east to Gravesend and Ebbsfleet, to provide interchange with HS1 services, subject to further capacity studies and provision of at least 30 trains per hour through the Isle of Dogs
 - Crossrail 2 (see more detail in section 4)
 - consider fuller scheme, with extensions to Stansted airport and to Barking Riverside / City in the east (supporting major housing development)
 - simplify scheme in south west London to reduce tunnelling costs
 - take over a Crossrail 1 branch as part of Crossrail 2, providing an interchange station between Crossrail 1 and 2 at Liverpool Street/Shoreditch and seek to avoid problems of turning trains and imbalances associated with Crossrail 1
 - Further east-west rail capacity in the areas adjoining the River Thames in east London in order to support development e.g. Crossrail 2 branch and/or Bakerloo line extensions
 - Bakerloo line extensions over and above the recently announced route from Elephant & Castle to Lewisham, to open up areas of development on the north as well as the south side of the river and improve transport capacity and resilience in east and south east London
 - A new Brighton – Gatwick – Stansted rail link via East London, interchanging with Crossrail 1 and Crossrail 2
 - New orbital rail routes including routes using new river crossings east of Tower Bridge with enhanced interchanges outside Central London, to improve peripheral connectivity and reduce congestion at main termini, such as extensions to the London Overground and improvements to interchange at locations such as Lewisham

- Upgrade main termini to improve passenger experience and reduce congestion
- Increase central /suburban rail capacity - through selective interventions, including capital investment and increasing train lengths.
- World class tube – fund signalling improvements and removal of congestion points to increase running capacity to at least 36 trains per hour on all routes
- Provide Northern Line Extension from Battersea to Clapham Junction
- DLR improvements including:
 - General capacity enhancements, improved service frequencies and upgraded stations
 - An extension from Bank to Euston, including a new station at Tower Hill (to facilitate closure of the Tower Gateway branch)
 - Further extensions to key centres such as Barking and Thamesmead.

Priority Road Schemes

3.4 CWG considers there is a need for a bold approach and agreement to a programme of schemes designed to bring London’s road network up to date including consideration of tolls, road pricing applied to all road users as well as extending the Congestion Zone in order to help fund improvements. Priorities for capital investment in road schemes should focus on providing and improving key links in the road network to improve connectivity, capacity, reliability and journey times, particularly for buses and essential servicing and delivery vehicles. It is particularly important to provide additional Thames crossings east of Tower Bridge to link the OAs in east London, north and south of the river, to maximise development capacity and improve economic synergies in the key development opportunity in London. Priority schemes include:

- Thames crossings in east London, notably at Gallions Reach
- Improved Orbital Routes, such as enhancements to the North and South Circular Roads:
- Underpasses / tunnels (to enhance capacity and improve urban realm), such as a link from the A13 to the A4 via Central London.

Key Funding Priorities

3.5 CWG ask that the Commission gives further consideration to several schemes which appear to offer the best outcomes relative to the GLA’s strategic objectives:

- Crossrail 1 extensions, particularly to Ebbsfleet and the West Coast Main Line
- Crossrail 2 extension to open up access to London Riverside
- Further extensions of the Bakerloo Line to serve planned regeneration areas and Opportunity Areas either side of the River Thames in East London.

Potential Funding Approach

3.6 London has an established framework for strategic spatial and transport planning, through the London Plan and the supporting Mayor’s Transport Strategy. The London 2050 Infrastructure Plan consultation sets the context for the development of the next London Plan and MTS.

3.7 It is imperative that strategic planning, and the infrastructure priorities that stem from this are supported by a long-term, consistent and sustainable funding stream. This means London needs more control over long-term funding and financing of strategic infrastructure.

- 3.8 The principle that the beneficiaries of major investment (people and businesses in London) should fund investment is compelling, and will ensure greater buy-in to infrastructure investment. Fiscal devolution would enable this, and remove some of the political uncertainty of major infrastructure decisions being made by Treasury, where long-term investment could be subject to political risk based on the false perception that investment in London is at the expense of other areas.
- 3.9 CWG support the ambition towards greater fiscal devolution of business rates and property tax revenues. Local income taxes are another option, which we think should apply regionally rather than just in London (as so many in the south-east commute into London, shop and use other services here).
- 3.10 In considering rail investment specifically, we note the recent successes of public/private approaches in London, including:
- Over-station development funding new stations, e.g. Crossrail 1 at Canary Wharf
 - Development cross-funding the provision of the station box at Woolwich Arsenal Crossrail 1 station
 - The anticipation that the Northern Line Extension from Kennington to Battersea Power Station will be fully funded by developments in the Vauxhall Nine Elms and Battersea Opportunity Area.
- 3.11 In considering road investment specifically, we also support the principle of road user charges to better manage London's road network (with tariffs allied to congestion) and to fund vital new road infrastructure. This would be more equitable than the current road tax and fuel duty.
- 3.12 In view of the desire to discourage private vehicle use, funding priorities should be focussed on increasing capacity on rail, DLR, tram and underground services, to open up new areas for housing and development, as well as addressing existing capacity constraints. Nevertheless, funding for roads should also be made to ensure sufficient capacity is provided for the needs of essential servicing / delivery vehicles, buses and cyclists.
- 3.13 Infrastructure providers should also consider ways for development opportunities, such as major housing schemes, to cross-fund new infrastructure.

4 Crossrail 2 – Improving the Cost: Benefit Ratio

Commentary

- 4.1 Crossrail 2 is currently proposed by TfL as a scheme linking Epsom and other locations in south west London with Broxbourne in Hertfordshire and New Southgate in north London.
- 4.2 Although a strategic north-south link will help London to grow and relieve congestion on key underground lines and at Network Rail termini, the proposed scheme misses the opportunity to help open up major housing and employment sites in east and south east London. It also does not serve major destinations such as Stansted Airport.
- 4.3 In south west London, there appears to be duplication with existing suburban services terminating at Waterloo. While possibly relieving congestion, this will add to operational complexity. The tunnelling options in south west London / Chelsea seem to be unnecessarily circuitous and lengthy. Consideration should be given to reviewing the proposals in south west London and providing the tunnel portal closer to Clapham Junction.
- 4.4 Crossrail 2 supports development of 200,000+ new homes along its alignment. It increases capacity between Clapham Junction and Euston, reducing pressure on the underground (especially the Northern and Victoria Lines) and freeing up track and platform capacity at Waterloo and Victoria stations. Connectivity is improved by new interchanges:
- **HS1** - at Euston/ St Pancras
 - **Crossrail 1** - at Tottenham Court Road
 - **Thameslink** – at Euston/ St Pancras
 - **Suburban routes - south** - at Wimbledon /Clapham Junction
 - Suburban routes - north - Tottenham Hale.
- 4.5 It is essential that the new interchanges are designed with sufficient capacity to comfortably handle anticipated passenger flows. This is particularly important at Tottenham Court Road where Crossrail 2 would interchange with Crossrail 1, the Central Line and the Northern Line and the expected numbers of interchanging passengers will be very high.
- 4.6 As currently proposed, Crossrail 2 would provide the primary route to Canary Wharf from the majority of south west London, with passengers interchanging onto Crossrail 2 at Tottenham Court Road. It would provide comparable journey times to the current route via Waterloo and the Jubilee Line, although waiting times for Crossrail 1 at Tottenham Court Road would be longer than those for the Jubilee Line at Waterloo.
- 4.7 10% of Canary Wharf employees currently pass through Waterloo, which the ‘Office of Road and Rail’ recently identified as Britain’s busiest rail station (99.2m entries/exits between 1 April 2014 and 31 March 2015). Recent analyses of TfL Railplan data by CWG have also highlighted that the Jubilee Line is likely to experience increasing congestion in the future in the absence of Crossrail 2. Therefore, CWG sees Crossrail 2 as important for providing journey choice and resilience and reducing waiting times for passengers joining the Jubilee Line at busy times, notably at London Bridge in the morning peak period, especially when Thameslink 2000 is fully operational.
- 4.8 The need to interchange at Victoria mainline station would also be reduced, which is currently Britain’s second busiest mainline station (85.3m entries/exits between 1 April

2014 and 31 March 2015). Particularly in the shorter-term, Crossrail 2 is also likely to relieve the Victoria Line and the Charing Cross branch of the Northern Line.

- 4.9 It is important that real-time information for all key routes is provided on trains on all lines including Crossrail 1, Crossrail 2 and the Jubilee Line. This will ensure that passengers can make informed decisions about which routes to use and where to interchange, based upon up-to-date knowledge of operating conditions and train occupancies.

Suggested improvements

- 4.10 CWG considers that the effectiveness of the current Crossrail 2 proposals could be improved as follows:

- Provide a branch from Euston/St Pancras to east London taking over the Crossrail 1 branch to Shenfield with a Crossrail 1/Crossrail 2 passenger interchange at Liverpool Street/Shoreditch. This would enable the Abbey Wood branch of Crossrail 1 to run with up to 30 trains per hour and would provide more rail capacity to and through the Isle of Dogs and Opportunity Areas in east and south east London
- Subject to further detailed capacity studies and provision of 30 trains per hour through the Isle of Dogs, it would be possible to extend Crossrail 1 to connect with HS1 services at Ebbsfleet and assist with regenerating North Kent Thameside
- If Crossrail 2 were to take over the Shenfield branch, it may also be possible to build another Crossrail 1 branch east of Custom House possibly taking over all or some of the c2c lines. This would support major housing development areas and higher density development in the east London Opportunity Areas including the Isle of Dogs, Royal Docks and London Riverside
- Extend Crossrail 2 services to serve Stansted Airport. This would significantly improve connectivity between central London/ City /east London and Stansted Airport and between Stansted and Heathrow as well as increasing the housing and employment development potential in the Upper Lee Valley Opportunity Area and beyond.
- Relocating the tunnel portal nearer Clapham Junction. This would reduce the costs of the route in south west London.

Infrastructure for a physically active nation

Submitted by Dr. Angie Page and Jess Read MSc., Centre for Exercise, Nutrition and Health Sciences, University of Bristol

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Jess Read holds a MSc. in Nutrition, Physical Activity and Public Health with distinction from the University of Bristol. She has worked for 15 years as an urban planner delivering innovative “liveable cities” projects for cities such as Copenhagen, New York, Shanghai, and London typically using urban flood mitigation to co-finance walking and cycling infrastructure upgrades. She currently works at the Centre for Exercise, Nutrition and Health Sciences at the University of Bristol.

Physical inactivity is estimated to cause 17% of deaths¹ and costs the nation £20 billion per year². The government ambition set out in “*Moving More, Living More*” is for a more physically active nation with all the potential health, social and economic benefits this can provide³. National physical activity and transport surveys provide clear evidence that transport is one of the most important sources of physical activity for both adults and children⁴. UK policy endorses that transport should assume physical activity delivery as a primary objective⁵.

UK levels of physical activity are low for adults and children⁶. This disproportionately affects women and girls. For example, there are currently over 10 million adult women in England alone who do not achieve the national physical activity guidelines of 150 minutes of moderate-to-vigorous physical activity per week⁷. Gender inequity is evident across physical activity settings, socio-economic categories and age⁸, indicating that a gendered approach to facilitating physical activity is necessary to equally include women. As such, **walking and cycling infrastructure must be designed specifically to meet women’s needs present and future as walking is their single most important source of physical activity.**

Pedestrian and cyclist safety in England is poor in both absolute and relative terms. The rate of killed or seriously injured per billion miles is almost 20 times higher for pedestrians than car occupants (484 vs. 25 respectively) and 43 times higher for cyclists than car occupants (1080 vs. 25 respectively)⁹. These rates are 3 to 10 times higher than absolute traffic injury rates of European counterparts such as Sweden, Denmark and the Netherlands, and up to 19 times higher when comparing rates for children¹⁰. Even allowing for the methodological limitations of traffic injury rates per distance travelled, this international data clearly suggests that our national traffic safety ambitions can be improved. Many cities across the world are adopting **zero accident targets for pedestrians.**

The economic case for infrastructure investment can not be made effectively without considering impacts on health. This is equally true for all areas of England including the north.

To this end, the following actions should be embedded as part of the national infrastructure strategy.

- 1) The inclusion of walking and cycling infrastructure within the infrastructure plans at a scale sufficient to facilitate measurable population increases in physical activity year-on-year in line with UK policy and the national physical activity ambition and Chief Medical Officers' national physical activity recommendations for both adults and children.
- 2) Ensuring that design and access to new walking and cycling infrastructure is open to currently underserved groups, particularly women and girls.
- 3) New planned infrastructure will deliver improvement in safety for pedestrians and cyclists measured in absolute terms as killed or injury per distance travelled, with a progressive goal towards zero deaths and serious injury for pedestrians and cyclists.
- 4) Further development of economic costs for different forms of travel in relation to economic, societal, climate and health benefits. This should include assessment of impacts on health, health costs, productivity, local spending, congestion, accidents, and air pollution.

This is an incredible opportunity to put physical activity and the nation's health at the heart of this national infrastructure investment strategy. This is the type of joined-up, innovative response widely recognised as necessary to increase population levels of physical activity and reduce disease risk both of which contribute directly to economic prosperity.

REFERENCES

¹ Global Physical Activity Observatory (2016) Country card England. Available at: <http://www.globalphysicalactivityobservatory.com/card/?country=EN> (Accessed: 5 January, 2016).

² Cabinet Office (2014) *Moving More, Living More Annexes*.

³ Ibid.

⁴ Based on data from national physical activity surveys: Active People Survey 7/8 and 8, Health Survey for England 2012, National Travel Survey 2013, National Census 2011.

⁵ Cabinet Office (2014) *Moving More, Living More Annexes*
Cabinet Office (2014b) *Inspired by 2012: The legacy from the Olympic and Paralympic Games*; Department of Health (2011) *Start active, stay active: a report on physical activity for health from the four home countries' Chief Medical Officers*; Department of Health (2013) *Living Well for Longer: A call to action to reduce avoidable premature mortality*; Department of Health (2015b) *Living Well for Longer: One year on*; Department for Transport (2013) *Action for Roads: A network for the 21st century*; Department for Transport (2013b) *Briefing on the Government's ambition for cycling*; Department for Transport (2014b) *Door to Door Action Plan: Progress Report*; HM Treasury (2014) *National Infrastructure Plan*; NICE (2015) *Physical activity overview*; Public Health England (2014). *Everybody active, every day: An evidence-based approach to physical activity*.

⁶ Based on data from national physical activity surveys, see reference 4 and: Cooper, A., Goodman, A., Page, A., *et al.* (2015) 'Objectively measured physical activity and sedentary time in youth: the International children's accelerometry database (ICAD)', *International Journal of Behavioral Nutrition and Physical Activity*, 12(113). DOI: 10.1186/s12966-0150274-5.

⁷ Calculated as 22,350,450 adult women ≥ 16 year * 45% not accumulating the Chief Medical Officers' guidelines of 150 minutes of moderate-to-vigorous physical activity per week = 10,057,703. Data for population in England from Office for National Statistics (2013); Data for prevalence of adult women not meeting the Chief Medical Officers' guidelines from the Health Survey for England 2012.

⁸ Consistent across national physical activity surveys, see reference 4.

⁹ Department for Transport (2015) 'Relative risk of different forms of transport, Great Britain: 2014, Table RAS30070.

¹⁰ DTU Transport (2012) *Risiko i trafikken*; Official Statistics Sweden (2014) *Road Traffic Injuries*; Official Statistics Sweden (2014b) *The Swedish national travel survey 2012–2013*; SWOV (2013) *Fact sheet: risk in traffic*; Wiklund, M. (2015).

Introduction

Over the past decade we have seen infrastructure creep up the agenda to a point that it is now firmly placed at the heart of the political debate. With investment in major transport, energy and utility projects increasing to record highs and the development of the National Infrastructure Plan to set out key Government priorities, we have reached a stage where infrastructure is a nationally significant issue that transcends party political ties.

The formation of the National Infrastructure Commission last year was greatly welcomed by the industry and provided a great level of confidence in the deliverability of major projects and enables the current Government and future administrations to speed up decision-making on vital transport, energy and housing programmes that Britain needs to continue to grow its economy.

CH2M is a global engineering and programme management company that works in the areas of areas of water, transportation, environmental, energy, facilities and defence. With over 2,500 people employed in the UK, CH2M is currently working on some of the most iconic infrastructure programmes including Crossrail, High Speed 2, Thames Tideway Tunnels, Crossrail 2, the decommissioning of Dounreay and was one of the leading partners in CLM, Delivery Partner to the ODA for the London 2012 Olympic & Paralympic Games.

Given our experience of working on the development and delivery of major UK infrastructure projects, we felt it may be helpful to share some of our thoughts around the points laid out in the NIC's call for evidence in order to share the lessons learned for the efficient delivery of future infrastructure priorities. In particular, this document presents our views for large-scale transport infrastructure improvements in London. We have made separate submissions outlining our views for infrastructure priorities for northern cities and electricity interconnection and storage.

Large-scale transport infrastructure improvements in London

Q1 – What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

In order for London's economy to continue to thrive and be globally competitive, London will need a step change in investment over the next thirty years that not just upgrades existing infrastructure but catalyses the city's growth through intensification of development in opportunity areas outside the central core.

The dense clustering of businesses in the centre creates synergies (agglomeration benefits) that make Inner London one of the most productive regions in Europe¹. These synergies are dependent on a network that efficiently moves millions of people per day to and from their place of work. Despite technology being available for employees to work remotely, strong demand for office space in Central London demonstrates that being physically present is as important as ever and the need to move large numbers of people to and from their places of work will likely persist.

London's robust economic growth, urbanisation and growing population is expected drive demand for additional transport capacity over the next three decades. London's transport stakeholders have risen to the challenge by delivering major projects such as Crossrail 1, Thameslink Programme and the Tube upgrade programme, which will provide London's residents with substantial improvements in capacity and connectivity across the network. Yet the capacity that these programmes deliver will not be sufficient to meet all of the expected demand. As London expands spatially and economically, further large-scale transport investment will be needed to deliver capacity on radial corridors that connect orbital routes to new urban employment centres while enhancing connections to the commuter hinterland. This will involve the proposed Bakerloo extension and Crossrail 2 to connect less well connected areas in the boroughs in the north, south east and south west where there exists potential for higher densities of housing and employment around transport interchanges.

As a global city, London's future competitiveness depends on being able to continue to attract and retain a high quality labour force which allows the city to sustain growth over the long-term. The cost of housing is a major challenge for London which leads to higher wage bills for employers and forces many of London's residents to move further out into the commuter hinterland to find affordable housing or migrate away from the city.

¹ Eurostat, 2015, Regional labour market statistics – GDP per person employed, NUTS2 level (2012 data)

Best-practice urban planning emphasises the importance of good public transport accessibility for the development of higher density housing. This allows residents to access their place of work within a reasonable journey time, and minimises the negative economic and environmental impacts of road congestion. Inevitably the Opportunity Areas where new homes are planned, many of which are located in outer boroughs, have lower levels of transport connectivity. To make these developments viable, London will need new high-quality rail links which connects these locations to employment centres in inner boroughs, and to ease congestion on existing routes.

Q2 - What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

CH2M's experience of evaluating and delivering some of London's largest transport infrastructure programmes informs us of the importance of closely aligning the timing of planned infrastructure improvements with strategic objectives. This involves prioritising transport projects such that their timing maximises economic benefits for the areas they serve and anticipating infrastructure requirements for the development of specific Opportunity Areas.

The Mayor's London Infrastructure Plan sets out the infrastructure projects that London will be required up to 2050 in order to sustain economic growth, maintain London's global competitiveness and provide for London's housing and employment land needs. However, a consideration for how these projects should be prioritised is not explicitly covered in the plan. Over the short to medium term, projects such as the Tube upgrade with clear benefits in terms of capacity, reliability and journey times should be prioritised, but over the longer-term this will not be sufficient to meet growing passenger demand and to relieve congestion. This is why larger scale projects such as Crossrail 2 and the Bakerloo Line Extension are being planned to deliver a step change in capacity.

Beyond providing extra capacity, further strategic and economic considerations must be taken into account. The London Plan sets out a spatial development strategy which focusses on the densification of urban centres with good transport links and the development of Opportunity Areas where there exists significant capacity to build new housing and employment space taking into account London's urban form which is bounded by a protected green belt. London's future development requires transport infrastructure with frequent, high capacity radial and orbital rail links to provide connectivity between these Opportunity Areas, to the urban core and to the commuter hinterland.

Some Opportunity Areas will develop with minimal public sector intervention while others will require substantial investment in essential infrastructure in order to be viable. This includes the Upper Lee Valley where it is recognised that a major improvement in transport accessibility via Crossrail 2 will be needed to unlock its housing potential. The Thames Gateway is another area with huge potential for residential development. However, over the years London's policy framework has not been able to unlock the full potential of the land. This points to the need for additional transport infrastructure beyond proposed schemes such as an extension of the DLR network in order to enable development in this area.

A key issue facing London in the future will be to find the space to accommodate a workforce that is expected to increase by one million over the next two decades². More people will put substantial pressure on London's already strained road network and pedestrian walkways, particularly in Central London. The historic layout of the city centre means that there is limited scope to expand road capacity. Strategy will therefore need to consider options that allow more efficient usage of existing roads, cycleway and pedestrian walkways supported by investment in smart road signalling technology and expansion of the cycle rental scheme and the cycle superhighways network.

Q3 - What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

CH2M is currently advising TfL on the business case for Crossrail 2 (CR2) which restricts our ability to provide detailed comments specifically about the costs and benefits of that scheme.

More generally, the DfT transport appraisal guidance (WebTAG) provides a robust and comprehensive framework that is comparable to the best in the world³. Recent changes have seen wider economic benefits appraised as part of the framework alongside direct transport user benefits. This represents a major step forward for the appraisal of major transport projects. However, it is acknowledged by the DfT that in some circumstances, the appraisal framework does not fully capture the economic growth impacts of transport projects⁴, particularly large projects

² GLA Economics, 2015, Updated employment projections for London by sector, Greater London Authority.

³ Mackie, P. and Worsley, T., 2013, International Comparisons of Transport Appraisal Practice, Institute for Transport Studies, University of Leeds.

⁴ Department for Transport, 2013, Understanding and Valuing the Impacts of Transport Investment, DfT.

such as HS2 and Crossrail 1 that are expected to change the economics of private investment in areas along the route, and produce regional and national level economic growth impacts.

Major transport schemes provide not just transport benefits but also support sustainable economic development, housing development and regeneration. CH2M's experience working across development and infrastructure sectors including water and energy underlines our view that it is important to adopt a holistic approach to evaluating infrastructure investment which takes into account all the transport and economic benefits of proposed schemes. These benefits are not currently quantitatively evaluated as part of the WebTAG framework but methodologies have been developed by other Government departments including DCLG for valuing the impacts of transport schemes on additional housing supply and land values. This points to the critical need for cross-departmental appraisal guidance, which follows the principles of the Green Book and the subsequent Five Case model, and importantly takes into account the various non-transport based economic externalities facilitated by transport investments.

From CH2M's own experience in delivering some of the UK's largest infrastructure projects, and reflected in DfT's 2014 commissioned report⁵ on how to extend and improve appraisal techniques in order to fully capture economic impact of transport investments, it is acknowledged that new techniques will be needed to fully account for the all economic impacts of projects such as Crossrail 2. This will involve quantifying the 'real economy' impacts of proposed interventions, covering the interactions between infrastructure, land use and spatial development. This will require using models that predict changes in land use associated with the transport intervention and the resultant uplift in land value, as well as Spatial Computable General Equilibrium (S-CGE) models, which has been used in support of our work for Lower Thames Crossing, that measure the true impact of strategic transport investments at regional and national economies.

Regarding the scheme's costs, we are of the opinion that adopting innovative contracting methods and programme management techniques, like those introduced by CH2M for delivering critical infrastructure associated with the London 2012 Olympics, could bring some efficiencies. In particular, such approaches could encourage contractors to deliver and share cost efficiencies during the delivery stage. They could also enable the programme to roll on and off the contractors responding to the changing need over different delivery phases.

Q4 - What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

CH2M is currently advising TfL on the business case for Crossrail 2 (CR2) which restricts our ability to provide details regarding the proposed funding arrangements of that scheme.

That said, the funding and financing options for Crossrail 2 have been explored in the *Funding and Financing Feasibility Study*⁶ undertaken for TfL by PwC. This includes examining the potential of using funding mechanisms employed by Crossrail 1 and Northern Line Extension (NLE). In the case of Crossrail 1, local funding was raised from a Mayoral Community Infrastructure Levy (CIL), Section 106 developer contributions, a business rates supplement for Greater London and the sale of land and property used during the delivery phase along with major contributions from Canary Wharf Development Group and Heathrow Airport Ltd. The Northern Line Extension receives funding from long-term business rate increments and a proportion of borough-level CIL and S106 receipts related to new developments in the Vauxhall Nine Elms enterprise zone.

Compared to Crossrail 1, where large sections run through the city centre, the benefits of Crossrail 2 are expected to be more broadly distributed across London's businesses, residents, transport users and the wider economy. This will mean a different funding package will be needed relative to Crossrail 1. This could include section 106 developer contributions, the extension of the Mayoral CIL and introduction of borough-level CILs to capture value uplift in areas substantially affected by the scheme. The funding package will also need to consider other options which were not possible for the Crossrail 1 funding package.

One option that would have important benefits for transport infrastructure funding would be the devolution of some taxation powers to London. London is more dependent on central government funding and has much lower levels of fiscal autonomy than other major international cities such as New York or Paris. A 2013 report commissioned by the London Finance Commission⁷ shows that London collects the lowest municipal taxes per

⁵ Laird J., Venables J. and Overman H., 2014, Transport investment and economic performance: Implications for project appraisal, DfT.

⁶ PwC, 2014, Crossrail 2 Funding and Financing Study, TfL.

⁷ University of Toronto Institute on Municipal Finance and Governance, 2013, 'International Comparison of Global City Financing', London Finance Commission.

capita amongst seven major city comparators. Only 26.2% of London's funding comes from own-source revenues compared to 82.5% in Paris. This limits London's autonomy to be able to fund and finance large-scale transport infrastructure improvements in the capital and make strategic decisions regarding investments.

Private financing has been used successfully for the Thames Tideway Tunnel using a regulated asset base model, whereby the finance costs are covered through the regulatory system. An adapted approach could be used by Crossrail 2 to secure private finance by issuing bonds which would be repaid by the Mayoral CIL and Business Rate Supplement. This would be a departure from previous rail financing mechanisms, which have involved either the DfT, GLA or TfL securing loans from public sector sources such as the Public Works Loan Board which are repaid through fares or the business rate supplement. However, a private finance approach may provide advantages through transferring a portion of the risk away from the public sector.

Capturing land value uplift attributed to improved transport accessibility in station catchment areas could provide an alternative funding stream if it can be captured through Stamp Duty Land Tax and Council Tax increments. A report by GVA⁸ predicts that Crossrail will increase residential capital values around stations on the route by between 20% and 25% up to 2021. Capturing such increases in capital values will of course be dependent on the regional devolution of powers to collect this revenue.

The current council tax system (where bands are set using 1991 property values) makes it difficult for increases in tax revenues to be captured and directed towards funding major transport infrastructure. In the Netherlands, capturing land value increments are made easier through a local property tax which is calculated as a percentage of the real (inflation adjusted) value of the property.

A further possible step would be the removal of TfL borrowing limits while retaining prudential borrowing rules. This would have the effect of improving flexibility to fund major transport schemes. Fiscal devolution could also provide financial incentives for boroughs to take difficult planning decisions, which would benefit from retaining some of the increases in tax revenues. More flexibility on borrowing limits would also allow TfL to replicate the example of MTR (Hong Kong's metro operator), which develops the assets above and around underground stations into commercial and residential schemes in coordination with city authorities. MTR uses revenues from these investments to fund the cost of expanding the metro network. In areas where Crossrail 1 stations already exist such as Tottenham Court Road, land value capture could be maximised through strategic location of station entrances. While it is acknowledged that there are substantial differences between London and Hong Kong which makes the comparison difficult, most notably the fact that all land in Hong Kong is owned by the authorities, there does exist an argument around the more effective development of TfL assets, and this could be facilitated through greater borrowing freedoms for TfL and the GLA.

⁸ GVA, 2012, Crossrail Property Impact Study, Crossrail.



Submission by the Chartered Institute of Logistics and Transport

to the

National Infrastructure Commission call for Evidence:

London's transport infrastructure

Introduction

The Chartered Institute of Logistics and Transport (“the Institute”) is a professional institution embracing all transport modes whose members are engaged in the provision of transport services for both passengers and freight, the management of logistics and the supply chain, transport planning, government and administration. Our principal concern is that transport policies and procedures should be effective and efficient, based on objective analysis of the issues and practical experience, and that good practice should be widely disseminated and adopted. The Institute has a number of specialist forums, a nationwide structure of locally based groups and a Public Policies Committee which considers the broad canvass of transport policy. This submission has been prepared by the Institute’s London and South East committees.

1 What are the major social and economic challenges facing London and its commuter hinterland over the next two to three decades?

- 1.1 Continuing population growth due to migration from other parts of the UK, Europe and beyond, increasing life expectancy and increases in younger populations.
- 1.2 Acute accommodation shortages and/or major expansion of housing stock requiring major increases in transport provision (bus and all forms of rail) to meet the demand for ever longer commuting journeys.
- 1.3 Changes to personal mobility patterns due to driverless personal transport which could have major implications for transport requirements as well as causing major difficulties for road capacity and parking provision in congested areas. NB the technology is as yet unproven and could be of little use where there is conflict with pedestrians, cyclists and other non-automated road users.
- 1.4 Changes to relationship between UK and Europe and break up of UK could have a huge effect on the viability of London and the south East which could cause either a strengthening or serious decline in the importance of London as a world

class centre. The result of the European Referendum could lead to major changes to London's importance in the world that at this stage are difficult to quantify.

1.5 Technological changes that could disperse working locations, particularly the increase in homeworking although effects of this on commuting are as yet relatively limited.

1.6 Increasing inequality, which risks resulting in options for funding transport enhancements through charges or higher fares being rejected as unfair and politically infeasible.

2 What are the strategic options for future investment in large-scale transport infrastructure improvements in London – on road, rail, and underground – including, but not limited to Crossrail 2

2.1 The options will depend on where the increase in the housing stock and in workplaces to accommodate the projected growth in London's population and employment is to be built.

2.2 Material increase needed in road and rail capacity on a number of routes within around Greater London. Currently capacity constraints are particularly acute on lower Thames river crossings as well as a number of key trunk routes in the South East and London. Whilst alternatives to car use and road freight transport need to be constantly sought to minimise the need for road capacity expansion it has to be accepted that free commercial traffic movement on key routes is essential for local, regional and the national economy.

2.3 Improved freight capacity and facilities needed within London and wider south East to cater for population increases, changes to travel patterns brought about by technological changes, particularly the move to online ordering and delivery. Transshipment between trunk and local movements will be essential both within road transport and between sea, rail and road. Ways of increasing non-road freight route capacity need to be found which could be around rather than across London. Ways would also need to be found to attract freight operators towards routes where there is greater potential capacity as opposed to routes already seriously constrained.

2.4 Future airport and runway decisions will have a considerable impact on transport flows in South East. Consideration needs to be given to developing other airports around London for freight and passenger movements (e.g. Stansted, London City, Luton and Southend) as well as the reopening of Manston, which could reduce traffic movements in critical areas of the road network. Building up some of these airports would also help strengthen local economies by improving local connectivity and job creation.

2.5 Greater use of River Thames and canal systems in and around London needs to be considered including what improvements to infrastructure are needed to make best use of these resources. The Thames can be used for passenger as well as freight flows. NB Wharfage has to be protected from high end housing schemes to allow future developments to happen.

2.6 Improvements to public transport in the areas outside the London boundaries would improve local connectivity and reduce car dependency which would reduce pressure on road and rail infrastructure within Greater London (See Section 6 below).

How should they be prioritised, taking into account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?

What might their potential impact be on employment, productivity and housing supply in London and the South East?

2.7 Assuming that the current demographic and employment trends continue housing supply throughout the south East will need to grow considerably although a change to London's economic performance could slow this down or even reverse the requirement although population increases are likely even if the economy weakens considerably

2.8 Automation and homeworking could reduce the pressure within London and encourage more people to live further out. They would also materially affect the transport network and future assumptions regarding network capacity.

2.9 Unless there is increased public and private investment there will be a considerable housing shortage for the foreseeable future

2.10 Both Transport for London and the Department for Transport have well-established decision-making processes set out in the respective organisation's Transport Business Case. Priorities should continue to be determined against these criteria.

3 What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme

3.1 Integrate as much as possible with existing rail infrastructure and any disused rail corridors still extant to minimize construction costs

4 What are the options for the funding, financing and delivery of large-scale Transport Infrastructure improvements in London, including Crossrail 2

- What is the appropriate local and regional contribution- given the potential distribution of benefits to business, residents, transport users and the wider economy- and how could this be achieved?

4.1 Better cooperation and integration of planning, infrastructure, housing etc. between Greater London and surrounding authorities (as per City Regions in rest of UK). Also closer working between the authorities outside Greater London.

- What innovative funding mechanisms could be considered to support delivery of key schemes?

4.2 Regional/local taxation

4.3 Road user charging and expansion of congestion charge – This will be vital if automated personal transport takes off

4.4 More effective use of developer contributions which could include a levy on developers in addition to or as an alternative to the current mixture of measures, some of which encourage wasteful spending by developers.

5 How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there lessons to be learned and applied in London?

5.1 Do European and other major Regional Transport Authorities provide a model for London to follow or does the London model work just as well?

5.2 Highway planning and management and bus services are dealt with differently outside the TfL area which inevitably constrains development. Funding in Shire and unitary areas is seriously constrained and getting ever more so year by year. This needs to be reviewed and changed if necessary.

5.3 UK Transport policy is based on the premise of maximising farebox contribution (usually involving annual fares increases at above-inflation rates) which is not the case in many other countries, particularly in Europe. The benefit of minimising subsidy against the extra capacity that would be required to accommodate demand from greater support levels needs to be reviewed and whether the provision of greater passenger transport capacity at more affordable fare levels and resulting increased usage would free up alternative road capacity for freight movement. There is also an affordability issue for lower paid workers who are paying a larger proportion of their income on transport in London than in major cities outside the UK.

6 General Comments and Points for Consideration

- 6.1 Clarity is needed on what constitutes London and what constitutes the south East and how far away from London the review should consider. For example improved transport links between Oxford and Cambridge, East Coast ports and the Midlands, along the south coast and between Kent and the Crawley/Gatwick/South London areas could all reduce vehicle and passenger movements into and out of London. What is good for London may not be good for the South East as a whole and vice versa. Transport needs, funding, provision, infrastructure and charging regimes should be less constrained by political boundaries. If current population trends and housing supply constraints continue people will continue to migrate outwards from London although transport affordability and in many areas, availability, raises a constraint to such outward migration as does an overloaded road and rail network.
- 6.2 Relative employment opportunities between London and the South East need to be considered as a whole with a view to spreading benefits to reduce the effects of overheating on the London economy and strengthening other economies that have suffered severe decline (e.g. south eastern seaside communities). This also needs to take into account the economies of regions throughout the UK and particularly within the northern super-region i.e. joined up thinking is essential for the UK as a whole.
- 6.3 Spending money on improved infrastructure in the South east may be more effective and deliverable as well as cheaper than directing the lion's share of expenditure into the Greater London area.
- 6.4 More clarity is needed as well as consistency within the region on what the priorities for transport related expenditure should be e.g.;
- Public v private transport and the role of cyclists and pedestrians
 - Passenger v. freight
 - The level of constraint on demand and desire for sustainable transport options
 - Road v rail and water
 - Airport capacity and locations
- 6.5 Other infrastructure considerations that have to be considered include;
- Funding the effects of climate related issues including coastal erosion from extreme weather (the current closure of the rail link between Dover and Folkestone is an example) or the loss of bridges, road damage etc. from flooding. These problems appear to be increasing due to the effects of global warming.

- The potential to damage to transport or other subterranean structures as a result of the increasing amount of below-ground building to provide additional residential capacity by building down rather than extending upwards which would be unlikely to receive planning permission. Planning regulations are probably the solution to this issue.

6.6 Overall Connectivity both within the South East and Beyond

- A high proportion of total transport movements between the UK and Europe travel through South east England and Kent in particular. As was seen in summer 2015 these movements are prone to major disruption whether due to industrial action, security issues or severe weather in the English Channel. Adequate capacity for freight transport to and from Europe is essential, particularly parking and driver rest facilities as well as provision of improved terminal facilities at other ports to allow for use by large ships when problems arise at the regularly used ports. Strengthening of rail capacity to the channel tunnel and ports is also needed (including around London to encourage trunk movements from the rest of the UK) to reduce the dependency on road networks. Continued development of North Sea and Thames Estuary ports with improved rail links should also be encouraged.
- As already alluded to outside the Greater London area public transport provision is generally to a much lower level, particularly on the majority of routes that are not rail-linked. Bus services are generally infrequent outside urban areas and often non-existent outside the core Monday to Saturday daytime period. The bus network (as well as the local charging regime) is almost entirely designed around what the commercial operators deem to be profitable that may or may not be the optimum network for a particular area and provision levels can vary considerably between comparable areas and bus operator groups. The road network is generally full to capacity at busy periods, Funding within non-metropolitan areas has been to traditionally lower levels than in London and is declining annually at an alarming level. If the current culture of car-dependency with its consequent resulting in an inefficient and environmentally questionable transport network is to be tackled a rethink is needed on how South Eastern England's transport network is funded and managed and how the planning system could be improved to reduce conflicting travel flows. The alternative will be a declining local economy due to the difficulty of moving freight and people around the South east and increasing inequality of movement for those without easy access to private transport.

- Regardless of London the South East is a very diverse area economically and demographically. There are a limited number of large cities but some major conurbations covering wide areas including the Brighton/Hove/Worthing conurbation, the Medway Towns, the South Thames side area, the Crawley/Gatwick/Redhill area and further afield the Solent area conurbation that includes Portsmouth, Southampton, Eastleigh, Fareham and surrounding areas. Transport links in and to and from these areas are in most cases poor when compared with comparable areas in other parts of the country as well as being heavily congested.

6.7 Whatever changes are made to discourage unnecessary movements within the Greater London area a balance has to be struck between the core London economy and the economies of the wider South East (and beyond). Evidence has been found (and which has been used to make the case for Crossrail 2) that productivity is higher in central London than elsewhere, even when differences in skills etc. are accounted for and concentrating high value employment in high cost areas generates income and revenue to fund the level of infrastructure needed in central London which would be unlikely to be justifiable anywhere else. Therefore a balance has to be struck between the differing economies in different areas. i.e. there is a need for joined up thinking that crosses political boundaries, business sectors, vested interests etc. that leads to decisions that benefit the UK as a whole as well as both London and the outer South east.

Submitted by:
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The Chartered Institute of Logistics and Transport
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January 2016

National Infrastructure Commission call for evidence, November 2015

**Memorandum from the City of London Corporation
Response to Question 3: London's transport infrastructure**

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

The City of London Corporation is committed to supporting and promoting the case for enhanced transport infrastructure, particularly in relation to rail services. As London's population grows and as the challenges of maintaining the Capital's status as a global city increase, a continuing programme of improvements will be needed to reduce congestion and free up capacity on rail routes serving the City of London and provide a stimulus to employment and housing growth in the London area.

The provision of adequate transportation infrastructure to cater for London's growing population and expanding employment base will continue to be a major challenge for the foreseeable future. Strong employment growth is already happening in the City of London; the City's local employment market is strong and total employment increased from 344,000 in 2008 to 414,000 in 2014. This is consistent with the aims of the London Plan 2015 and the City of London Local Plan 2015 which are both planning for significant office and employment growth and modest housing growth in the City of London by 2026. The range of office occupiers has broadened in recent years from its financial services base so that the City is now seen as an attractive business location for a wide range of companies. However, maintaining the City's competitive position as the world's foremost international business and finance centre is heavily dependent upon good transport links both within London and its commuter hinterland. In addition, the urgent requirement for additional housing in the London area will also increase the need for improved transport links between the suburbs and the central business district.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

Although various important transport projects, such as Thameslink and Crossrail, are under way, the legacy of many years' under-investment in the Underground and National Rail means that the additional capacity provided by these projects is likely to be fully utilised shortly after they open. Thus a continuing programme of rail capacity enhancements is required with a particular focus on improving the accessibility of areas with potential for major housing development such as the Lea Valley, Ebbsfleet, Barking Reach in the east and Old Oak Common in the west. Additionally from a business perspective there is a need to improve rail links to London's airports.

The City Corporation's priorities include:

Crossrail - This project will significantly improve east-west rail connections across London but the proposed train service pattern does not make full use of the new infrastructure, as a significant proportion of trains from the east will not travel beyond Paddington. The following measures are therefore recommended in order to maximise the value of the project:

- Extension of Paddington terminating trains to Tring/Milton Keynes on the West Coast Main Line via a new connecting line at Old Oak Common. This improves utilisation of the Crossrail tunnels, improves accessibility of the Old Oak regeneration area, provides new direct links to the West End and the City for commuters from north-west London and beyond and reduces the number of trains terminating at Euston (thus releasing capacity for HS2 and other services).
- Extension of Crossrail from Abbey Wood to Ebbsfleet and Gravesend to facilitate housing development in North Kent, particularly the development of Ebbsfleet Garden City.
- Provision of a direct fast Crossrail service between Heathrow T5, central London and Canary Wharf. Current proposals only provide for a stopping service between Heathrow T4 and central London which will not meet the requirements of many business travelers. This may require the amalgamation of Heathrow Express services into Crossrail.

West Anglia Main Line – Four-tracking the West Anglia Main Line is a key priority as it will allow a significant increase in capacity by separating fast and stopping services on this congested corridor. This will meet the long overdue need for faster and more frequent services to Stansted Airport and Cambridge and allow the provision of enhanced commuter services which will open up the potential for significant housing development around stations in the Lea Valley regeneration zone. Four-tracking is a necessary precursor to the future extension of Crossrail 2 services beyond Tottenham Hale.

Crossrail 2 - Although Crossrail 2 does not serve the City of London directly, it will boost the capacity and resilience of the central London public transport network and help to relieve overcrowding on key rail and Underground routes which do serve the City. This in turn will increase the attractiveness of the City and help to maintain its position as the world's leading financial and business centre. The key benefits for the City are:

- a reduction in severe overcrowding on Northern line;
- relief of congestion on suburban services into Waterloo;
- relief of congestion on suburban services into Liverpool Street;
- release of capacity at Liverpool Street through the diversion of some West Anglia suburban services onto Crossrail 2 which will allow enhancement of other services, such as those to/from Stansted Airport;
- release of capacity at Waterloo through the diversion of some South West suburban services onto Crossrail 2 which will allow enhancement of longer distance services, such as those to Woking, Guildford etc.;

- potential relief of crowding on the Central line if the future Eastern branch of Crossrail 2 is pursued:
- a significant improvement in accessibility for neighbouring Hackney and the Upper Lee Valley which will assist with regeneration and housing growth.

London Overground – TfL's proposal to extend the Gospel Oak-Barking Line to serve Barking Reach is supported as a means of opening up this area for much-needed housing development.

London Underground – It is essential that there is continued investment in upgrading the London Underground network. Passenger numbers are at an all-time high and look set to grow further, so it is very disappointing that some planned improvements, such as the re-signaling of the sub-surface lines, have been seriously delayed. The following are key priorities:

- Bank Station Capacity Upgrade - Transport & Works Act powers were granted in 2015 and implementation now needs to be expedited to deal with critical congestion problems at this key interchange.
- Sub-surface re-signaling – urgently needed to increase capacity on the Circle, District, Hammersmith & City and Metropolitan Lines.
- Extension of the Bakerloo Line to Hayes to improve accessibility of south-east London and release capacity on National Rail routes into London Bridge.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

The main opportunity to increase the benefits of Crossrail 2 is the proposed Eastern extension which will open up opportunities for regeneration in East London and help to relieve overcrowding on the Central Line and National Rail routes serving Liverpool Street.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

As has been seen with the Jubilee Line Extension and Crossrail, land and property values raise in expectation of future transport enhancements. There must be close coordination between the GLA, TfL, London Boroughs and other planning authorities outside of Greater London to ensure that planning policy is coordinated to maximise the benefits arising from infrastructure improvements.

To make sure that the benefits of future transport improvements are captured there needs to be an early comprehensive assessment of current land values, which should then be used to capture increases and recoup some of the uplift. The private sector should be expected to provide significant funding as businesses will directly benefit from such infrastructure improvements.

A key issue is to ensure that funding arrangements give the private sector certainty about their levels of contribution. In addition planning authorities need to develop policies (for example, in relation to social infrastructure and affordable housing contributions) which reflect changes in accessibility brought about by transport improvements.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

No comment

CECA Consultation Response

Civil Engineering Contractors
Association
1 Birdcage Walk
London
SW1H 9JJ

National Infrastructure Commission
1 Horse Guards Road
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SW1A 2HQ

8 January 2016

Dear Sir/Madam

[National Infrastructure Commission call for evidence](#)

1. The Civil Engineering Contractors Association (CECA) welcomes the opportunity to respond to the above named consultation.
2. CECA provides the voice for those companies large and small who create, improve and maintain the UK's vital transport and utility networks. Our membership of more than 300 companies together delivers an estimated 70-80 per cent of all infrastructure construction work carried out nationwide. Our industry supports the employment of around 200,000 people with annual output of up to £25 billion.
3. We have long argued that the development of infrastructure in the UK has lacked long-term strategy. This has meant that large projects such as Crossrail and High Speed 1 have taken far too long to develop and build. Today, the delays we continue to see in solving the problems of airport capacity reflect this challenge.
4. Delays damage the construction industry's confidence in national infrastructure planning, resulting in lower investment in innovation and training within the industry.

The National Infrastructure Commission

5. CECA therefore welcomed the news in October 2015 that Chancellor George Osborne would establish an independent infrastructure Commission to help Government plan for the long-term. This is a policy change we discussed in our 2014 policy document, *The Infrastructure Decade*. It was also a recommendation of *Securing our Economy: the Case for Infrastructure*, CECA's joint report with the Centre for Economic and Business Research in 2013.
6. We anticipate that the new Commission will be given real authority to assess and make proposals for long-term major infrastructure projects alongside its development of innovative solutions to fund these infrastructure requirements.
7. In our view, the Commission should build on the existing National Infrastructure Plan to provide an overarching national infrastructure policy framework, linking to all Government departments and major stakeholders, helping to align strategies.
8. The new Commission must be empowered to become a truly independent expert body with a clear long-term role. This would give the construction industry, the business community and the wider public confidence in the direction of UK infrastructure for the long-term.
9. We recognise that the Commission has been established to advise on infrastructure, rather than to make decisions. It is appropriate that the final decision on matters related to strategically important infrastructure issues rests with those who have been given a democratic mandate to do so.
10. However, we also recognise that the credibility of the Commission, and its potential to build confidence in the long-term future of the UK's infrastructure planning, will be strongly linked to how the Government of the day responds to any advice that it provides.
11. As such, we would have concerns if the Commission's advice is not typically accepted and acted upon. Were this to be the case, there is a risk that the Commission would actually serve merely to perpetuate and amplify the political challenges that it has been established to help cut through.
12. **We anticipate that the Commission will prepare an annual report of its activities. We recommend that this report provides an item-by-item overview of the advice that has been provided to government, along with a RAG rating of whether that advice has been implemented in part or in full. This will allow stakeholders to have visibility of the Commission's views on whether its advice is being taken up.**

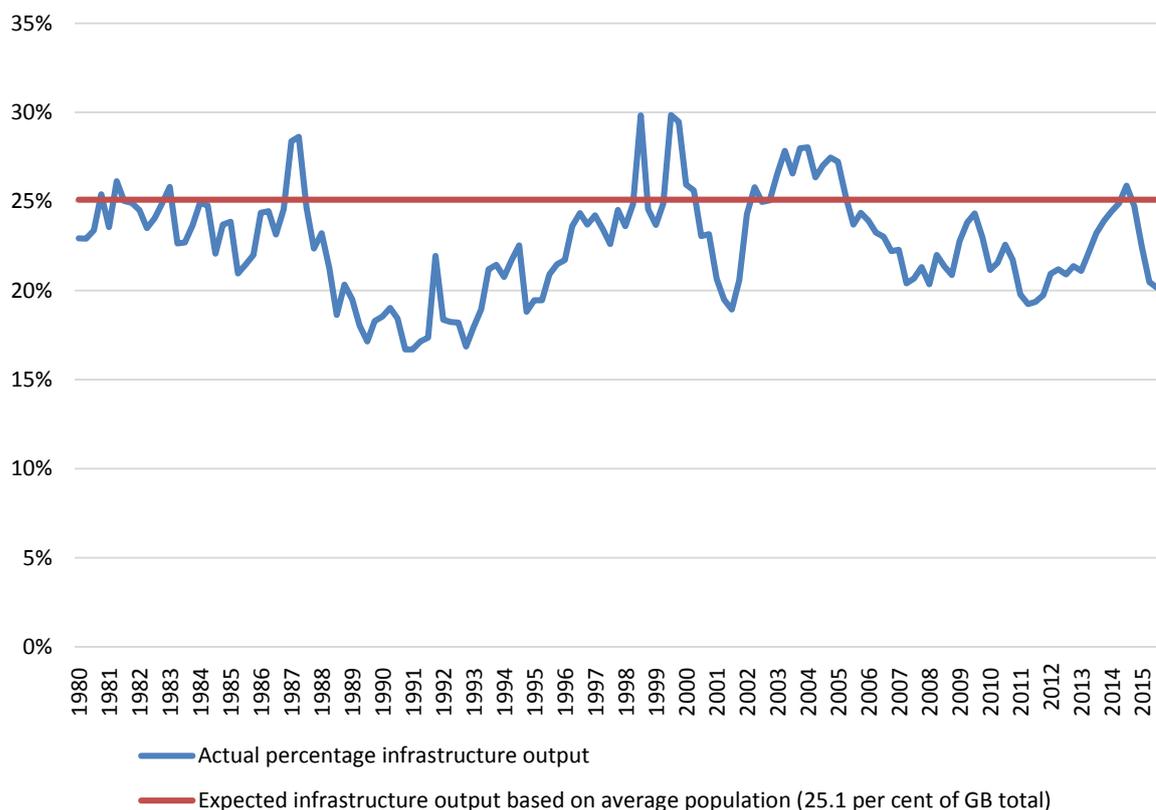
CECA response to the Call for Evidence

13. Much of the Call for Evidence focusses on issues related to strategic planning for infrastructure. While our members have an interest in these issues, we do not collect evidence that would be useful to support the Commission in these areas. As such, we have limited our initial response to those areas where we feel we can provide useful views from industry.

Improving connectivity between cities in the North of England

14. Our members have a dual interest in the issues of connectivity in the North of England. Members of our regional associations in North East, North West and Yorkshire & Humberside not only deliver an estimated 70 per cent of all transport infrastructure construction work in the North of England, but are also extensive users of the networks. As such, they have extensive experience of the challenges of connectivity between northern cities.
15. These companies recognise that the North of England has historically seen a lower level of investment in its infrastructure than elsewhere in the UK. The difference is particularly acute when comparing investment in northern England with that in the South East and London.

Northern infrastructure output as percentage of GB infrastructure output

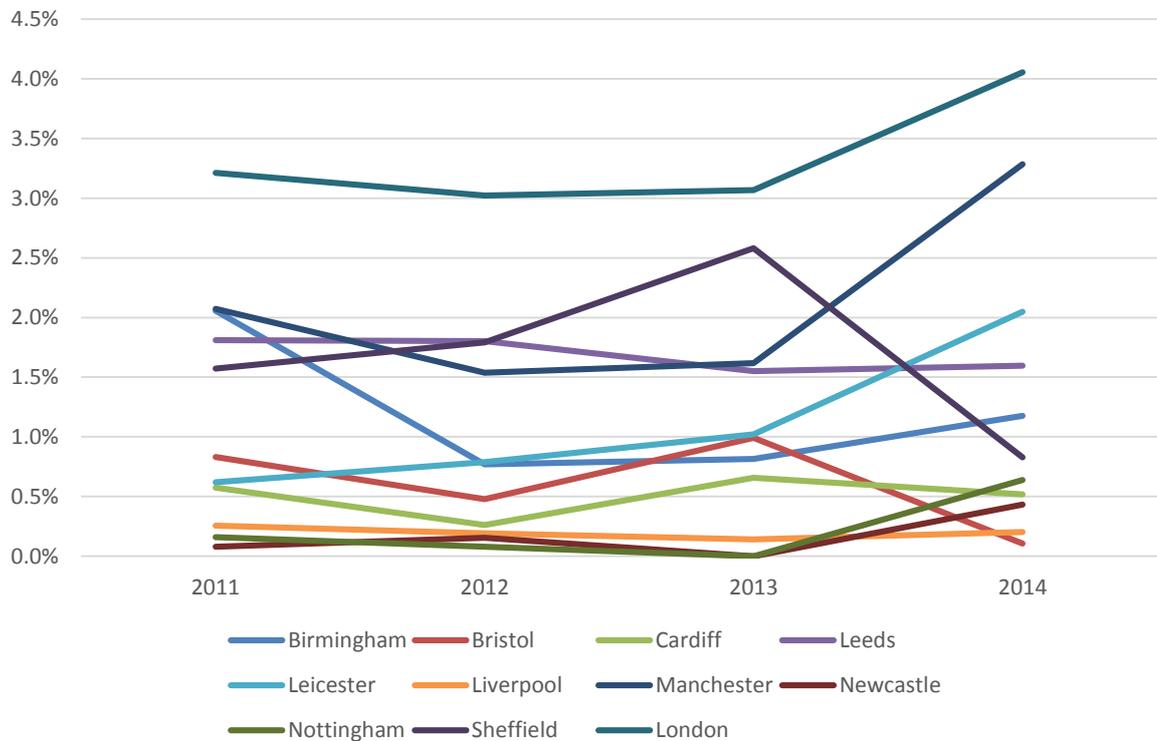


16. The graph on the previous page illustrates this issue. It shows that since the Office of National Statistics started collecting output figures for infrastructure in 1980, regional breakdown of the data shows that the North of England (North East, North West and Yorkshire & Humberside) has largely seen lower levels of output in infrastructure than would be expected based on its 25.1 per cent average share of the GB population.
17. There are many strong arguments why this may be the case. While many of the UK's largest cities are in the North, the most populous regions of the UK are the South East and London. This large and growing population creates additional pressure on infrastructure networks, necessitating investment to maintain network capacity and availability.
18. We see evidence of this in the levels of congestion on roads in London and the South East compared with the rest of the country. According to Department for Transport figures¹, 17 of the 20 local authority areas with the greatest delays due to congestion are in London and the South East.
19. Similarly, official figures² show that London experiences more overcrowding on its trains than any of the northern cities (although the most recent figures for Manchester suggest that it is starting to experience similar levels of congestion).

¹ Department for Transport - *Average journey times during the weekday morning peak on locally managed 'A' roads: by local authority in England, annual averages from 2006/07*

² Department for Transport - *Passengers in excess of capacity (PiXC) on a typical autumn weekday by city: annual from 2011*

Passengers in excess of capacity on a typical autumn weekday by city: annual from 2011



20. The economic geography of the UK also means that the business cases for investment in London and the South East are stronger, as assessments are built (in part) on the basis of economic impacts of investment on business users and private sector providers. The higher economic output of London and the South East therefore strengthens the economic case for investment as 'higher value' impacts will be achieved.
21. However, these factors create a self-sustaining vicious circle, with investment in housing and industry 'sticking' in London and the South East. This creates a more unstable economy in the region with rising population and increasingly costly infrastructure to mitigate the congestion this creates.
22. As we will discuss later in this paper, we do not believe that the response to this should be to transfer transport investment away from London. The factors that underpin London's rapidly rising population will take time to resolve, and it would be dangerous to remove the investment that ensures that the capital's transport networks can continue to function.
23. But we equally recognise that some of the pressure on London could be relieved if cities outside London, including those in northern England, offered the factors that currently attract people and investors to London. In doing so, they could draw people away from London, while stimulating more balanced economic growth across the country.
24. It is very clear that appropriate investment in transport is one of the most effective mechanisms to boost economic activity in a region. Our report *Securing our Economy: the Case for Infrastructure* found that for each £1 billion increase in infrastructure investment, UK-wide GDP increases by a total £1.299 billion. Furthermore, for every

£1 billion of infrastructure construction increases overall economic activity by £2.842 billion.

25. Importantly, investment in infrastructure boosts job creation. The same report found that for every 100 jobs created during the construction of infrastructure, a total of 305 jobs are created in the economy as a whole. There is also strong evidence of a link between infrastructure investment and the development of new housing.
26. **For the above reasons, we believe that the Commission may wish to consider whether future transport investment appraisal may put additional weight on the ‘rebalancing’ impacts that can be achieved through investment outside London. This should not be seen as a political fix to move investment towards the North (although it may drive a ‘fairer’ balance of investment across the country in the future). Instead, it is a way to give greater recognition to the rising costs to the wider UK of an overheating economy in London and the South East, while still expecting each project to demonstrate the value that it creates.**
27. We believe that part of the challenge for the northern cities in terms of their ability to present credible cases for transport investment arises as a result of a lack of coordination. Historically these cities have tended to compete for resources rather than collaborate effectively. As such, they have not had the ‘firepower’ to present a consistent vision for their needs, in a way that London has been able to.

28. For this reason, we have welcomed the development of Transport for the North (TfN). We believe that it has the potential to develop a credible vision for the future of transport in, and between, the major cities of northern England. If it functions effectively, it should be the best positioned body to analyse and determine what the most appropriate major transport interventions should be across the North of England, and build a credible case for how they should be delivered. But in order to do so, it is vital the TfN is provided with the appropriate level of resources to discharge this role.
29. To this end we would wish to see strong leadership and authority from the newly established TfN. Clarity must be given as soon as possible on the role of TfN and how it will interact with other regional transport bodies including Transport for Greater Manchester in this work.
30. Part of this work will necessitate TfN to consider how future investment will be funded. While we would anticipate that existing funding streams would continue or be replaced, this will not be sufficient to cover the full cost of delivering the TfN vision.
31. To ensure that resource constraints do not hold back delivery of this vision, we believe that TfN should build on the successful funding model for Crossrail. The large scale of Crossrail meant that it could dig deeper into who the beneficiaries were for the project, and therefore more closely tie the funding for the work to those who would see the greatest benefit. As a result, Crossrail's funding was drawn from a wide range of stakeholders including major companies (Heathrow, Berkeley Homes), wider industry (Business Rate Supplement), and the tax payer (DfT and GLA/TfL) with each paying a fair contribution based on the benefits they would realise from the project.
32. **As such, we recommend that TfN be given the freedom to consider a programme-level 'northern transport deal' that would look at the full range of beneficiaries from the plans, developing a mechanism that seeks contributions based on all stakeholders making a fair contribution based on the benefits that they will see from the programme being delivered. This model will also have the additional benefit of confirming the support of the population of the North of England for TfN's plans.**
33. CECA members are increasingly concerned about the deterioration of local roads in northern England due to decreasing local maintenance spend. The majority of vehicle journeys begin on local roads, and it is vital that these too are well maintained to ensure efficient journeys across national networks. There is an ever increasing backlog of local maintenance work which we believe must trigger an urgent rethink of the way repairs are funded.
34. To ensure there is enough money for highways maintenance alongside other major infrastructure projects, we propose wider use of prudential borrowing, while consideration should also be given to private finance models and the targeted use of local authority reserves.
35. We also feel that there are lessons from the water sector's transition from CAPEX to TOTEX spend, with greater consideration of the best way to invest to achieve outcomes, rather than purely looking at capital solutions.

London's transport infrastructure

36. As noted in our response above, we see transport congestion as a fundamental and enduring challenge to the future of London. This is not only a problem of London's future but one of its present, with increasing challenges associated with the use of the capital's road and rail networks. Already some of London's stations are overcrowded to the point that they are not accessible at certain times during the day, while commuters are unable to board some trains into the city at peak times. The capital's roads congestion is not only the worst in the UK, but is also higher than any other city in Europe³.
37. For this reason, as noted above, we believe that there needs to be a twin approach to resolving these issues. The first priority must be to ensure that demand continues to be met. This will require sustained investment in all of London's transport networks. However we also see the need to develop a strategic approach to divert population growth away from the capital by presenting viable opportunities elsewhere in the UK.
38. **We recommend that the Commission seeks evidence of the factors that are underpinning London's continuing economic growth. This evidence should then be analysed to consider how these factors might be replicated elsewhere, while using appropriate demand management to ensure that London's future population growth is better matched to its ability to respond.**
39. When looking at the specific large scale transport improvements that are required in London, we believe that decisions on which options to take forward should be based on which will deliver the best outcomes for London and the UK as a whole.
40. On this basis, the case for the delivery of Crossrail 2 seems very strong. The route targets an alignment that will tackle some of the most pressing congestion hotspots on the existing rail network, while also opening up significant tracts of land in north east London for the development of the housing that will be required to meet London's growing population, even if efforts to divert some population growth away from the capital are successful.
41. While recognising that the project will require significant upfront development funding, we understand that Transport for London forecasts that delivery of the project will largely pay for itself through a similar funding model to Crossrail, with those in the capital who will benefit from the project being asked to contribute towards its cost.
42. Through the recent/current delivery of Crossrail, Thames Tideway Tunnel and Northern Line Extension, London has developed a sustained pipeline of major tunnelling projects with continuity of workload for the sector. We anticipate that this pipeline will extend into the near future with works to deliver HS2 and the Silvertown Crossing.
43. However, there is a risk that the expertise that has built up in the UK may be lost if Crossrail 2 does not proceed. This would have negative consequences for the UK's

³ Europe's most congested cities in 2014 (ranked by annual hours wasted):
<http://inrix.com/press/scorecard-report-united-kingdom/>

ability to sustain this trained workforce to efficiently deliver other future tunnelling projects.

44. We also believe that there are significant opportunities to increase the benefits and reduce the costs Crossrail 2. Experience from many previous large infrastructure projects shows that many of the opportunities for efficiency and additional benefit are constrained due to decisions made at the earliest stages of development. Choices around the route, access and broad construction methodology tend to be taken early in the project life cycle, yet these can have significant downstream impact.
45. The companies who are involved in the delivery of infrastructure will tend to have the best understanding of where these opportunities lie. However, the pressures of existing procurement regulation mean that project developers often find it difficult to engage suppliers early to seek advice, for fear of falling foul of rules intended to avoid later conflicts of interest.
46. We believe that the revised EU procurement regulations give greater clarity that such early engagement is acceptable, with appropriate safeguards.
47. **As such, we believe that Crossrail 2 should be used as an exemplar of what can be achieved by appropriate early involvement of the supply chain in the development phase. Our engagement with members indicate that such activity could reasonably be expected to deliver at least 20 per cent savings against typical costs for a more traditional approach.**
48. We believe that this engagement could be achieved through ‘ultra-early’ appointment of suppliers to work on the scheme right through from early development through to delivery. However, recognising that this may be perceived as closing out options for competition for the delivery phase, we also see options for appointing an independent panel of advisors, drawn from industry, who would provide buildability advice to Crossrail 2 Ltd. Such advisors could be appointed from a panel of volunteers that would be seconded from industry, selected for their specific expertise around a given issue, and paid on a consultancy basis via a standalone body to remove any issues around conflict of interest. This would allow Crossrail 2 Ltd to benefit from the insight that could release the cost savings outlined above, while avoiding any concerns that advice from individual supply chain companies could see those companies barred from bidding for future work.



**Community
Transport
Association**

Response to the

National Infrastructure Commission Call for Evidence

Closing Date: 08/01/2016

The Community Transport Association

The Community Transport Association

The Community Transport Association is the national body working with the providers of community transport helping them to remain relevant and responsive to key areas of public policy and make a big difference for people and families in the communities they work in. These are typically charities and voluntary groups rooted in their own local community.

The CTA is the UK's leading authority on the practice and performance of the UK's community transport sector and uses its research to gather insights and intelligence from local communities to inform the development of public policy.

We are for, and about, accessible and inclusive transport.

We work with people who all want the very best for their communities and see accessible and inclusive transport as part of the answer to the big questions about how we are all to live, learn, work, participate and belong.

We work for a better world where individuals are able to design their own ground-up transport solutions, placing accessibility and inclusivity centre-stage in a way that nobody else ever has.

Community transport

In all parts of the UK, on every day of the year - including Christmas Day – thousands of community transport staff and volunteers are helping people to stay independent, participate in their communities and to access vital services and employment.

Community transport is about providing flexible and accessible community-led solutions in response to unmet local transport needs, and often represents the only means of transport for many vulnerable and isolated people. Significant user groups are older people and disabled people.

Using everything from mopeds to minibuses, typical services include voluntary car schemes, community bus services, school transport, hospital transport, dial-a-ride, wheels to work and group hire services. Most services are demand-responsive, taking people from door to door, but a growing number are offering scheduled services along fixed routes where conventional bus services are not available, especially in rural areas.

As community transport works to a different business model to commercial passenger transport services - i.e. it is always run for a social purpose and community benefit, but never for a profit - it often a more reliable and resilient way of ensuring a broader range of transport needs can be met.

Whilst the journeys community transport delivers account for a small proportion of the total passenger journeys made every year by the public, their significance in improving the lives of the people who use these services is remarkable.

CTA's Response to the Consultation

The CTA welcomes the opportunity to contribute to the Infrastructure Commission consultation process.

Community transport in all its forms, has the potential to offer a more reliable and resilient way of addressing a growing number of transport needs and accessibility issues. The possibilities are immense. Services that are needs-led, community-run, not-for profit, highly collaborative with high levels of volunteer involvement are all getting a good hearing in the debates about building better and more sustainable transport which is accessible and inclusive. It makes sense that the Infrastructure Commission should also want to hear about and consider the contribution of this vital, but often low-profile, part of the transport network.

In responding to the Commission we have structured our response around the relevant questions in the consultation document. Where possible footnotes are provided that point to further evidence for consideration. This response refers to the heading "For future investment in the north's transport infrastructure." In addition we have also made some general comments in relation to section 3 on London's Transport Infrastructure which mirror some of our conclusions on the role of community transport in connecting northern cities.

Contact Details

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Follow CTA on twitter @CTAUK1

To what extent are weaknesses in transport connectivity holding back northern city regions (specifically in terms of jobs, enterprise creation and growth, and housing)?

Weaknesses in transport connectivity

- 1 Different stakeholders will view 'weaknesses' through different lenses. At the Community Transport Association we believe transport systems are weaker when:
- 2 The needs of vulnerable and isolated people and communities have not been at the forefront when public services and infrastructure have been designed. This includes older people, disabled people, those with long-term conditions, those living in social isolation and those who cannot access employment, education or training.
- 3 The system focusses solely on private car use and mainstream public transport and does not recognise and include activity from the ground up - community-led transport solutions and the local sharing economy. Not owning a car should not be a barrier to achievement or aspiration.
- 4 The result of these weaknesses is poor integration across and within different modes of transport with a lack of connectivity which, amongst other things, does not reconcile unused capacity with unmet needs.
- 5 The CTA's vision is of a more integrated transport network built from the ground up. The CTA believes the UK Government deserves a good hearing on its ideas for devolving more decisions about local transport and we welcome the moves by transport authorities and public bodies across the north to embrace the opportunities this may present.
- 6 However, we also know that many organisations are finding it hard to listen when faced with the reality of cuts to local government funding. The impact on the number and reach of bus services as a result of reductions in public spending have been well documented by organisations such as the Campaign for Better Transport.
- 7 As good transport links have a demonstrably positive link with employment we are worried that poor bus infrastructure will prevent many communities, particularly those in rural areas, from both supporting, and benefiting from economic growth. It is usually poorer people who are the most dependent on bus travel. Therefore there is a real danger that social isolation could quickly be translated into economic isolation for people who live in northern rural communities. Furthermore, as job seekers are dependent on effective infrastructure we believe that transport connectivity is vital for encouraging economic growth within northern city regions.

Social and economic benefits of community transport

- 8 We believe the social and economic benefits of community transport means that community transport should be considered integral to the debate about on how connectivity can drive economic growth.
- 9 Many community transport operators support local businesses through enabling people to access retail and other services on the high street. New research published in January 2016 estimated that for every pound invested by Devon County Council on community transport; almost £9 is spent in the local economy; with community transport services users spending an estimated £2.2 million in Devon high streets each year.
- 10 Councillor Stuart Hughes, Devon County Council Cabinet Member for Highway Management, in welcoming these figures said “Community transport is extremely important in Devon in helping people to maintain their independence and continue living at home. It provides a lifeline to those who may otherwise be isolated and, as these figures show, it is also important in supporting the local economy. Community transport... helps people who find it hard to get around to access their local shops and other services. The benefits to our local market and coastal towns are clear, and the success of community transport is thanks to the dedicated staff and volunteers.”
- 11 Community transport operators provide direct employment and opportunities for volunteers, which can enhance their chances of entering employment and reducing social security costs. Volunteers within community transport also benefit from social interaction that they may not otherwise get and provide a net economic benefit to society when the value of their time and contribution is monetised.
- 12 Poor access to private and public transport is a common labour market barrier for many young people. Community transport operators help them through initiatives such as Wheels to Work. South Yorkshire Wheels to Work has helped more than 500 people over three years to get to work, training or college through lending them a scooter and safety equipment and providing them with training.
- 13 Another example of a bespoke local service that addresses labour market barriers was set up by Ilfracombe and District Community Transport from Job Centre Plus. Local employers in the hospitality sector were having difficulty recruiting due to the lack of public transport in the evening. The community transport operator set up a late night minibus service running seven nights a week, picking up from several premises in the local area in order to take employees back to their homes in Ilfracombe.
- 14 In addition to investment in community leading to economic growth and job creation it can also lead to savings being made to the public purse by reducing spend in other areas.

- 15 Community transport services are of significant importance in supporting personal independence and tackling isolation. By supporting people to access vital services and social networks they enable them to stay in their own home which reduces the likelihood that they will need more costly publicly-funded care.
- 16 Community transport offers a wide range of benefits to local authorities and other public bodies. They are often less costly than their commercial equivalents and offer alternative solutions when conventional and subsidised bus services are withdrawn or are not viable, especially in rural communities.
- 17 Community transport operators will also often create value for some public services that have not had to make a financial contribution to receive those benefits. An example is in health, where the CTA survey of operators in England in 2014 found that 74 per cent of operators were enabling people to access health services, but only 24 per cent received any funding from the health bodies benefiting from this.

Improving transport connectivity

18. In improving transport connectivity within city regions we believe a number of actions regarding infrastructure are necessary. The first is that we believe local people should be given a greater role in shaping local transport that works for them. It is our belief that local infrastructure can only be improved through giving local authorities the power to develop integrated transport systems that include community transport from the outset. We believe that more has to be done to encourage more collaboration between the private sector and community transport operators, as a lack of collaboration leads to poor connectivity, inefficiencies and underused capacity in the system. We would contend that even though many mainstream public transport services have improved their inclusivity and accessibility in a meaningful and measurable way attention still needs to be given to all parts of the door to door journey. If people cannot get from their front door to the accessible train station because the first part of their journey cannot be made then the high profile measures taken to improve accessibility in public transport will not have fulfilled their promise or potential.
19. Looking at connectivity between northern city regions we know that poor access to private and public transport is a common market barrier for many young people. It has to be a particular concern that local authority cuts may make it impossible to simultaneously build affordable housing, and support effective transport, further decreasing mobility for many people. Community transport operations have a positive economic impact on city regions¹, and we believe that for this benefit to be felt between city regions it is necessary to consider how transport is regulated between city regions. We believe that regulation

¹<http://www.ctauk.org/UserFiles/Documents/In%20Your%20Area/England/State%20of%20the%20Sector%20for%20inhouse%20print.pdf>

needs to be proportionate to better recognise providers who work across town and city borders.

20. Fundamentally, capital infrastructure investment needs to ensure passengers are able to traverse the transport network by a range of different transport modes. Key to achieving this is investment in an intergraded transport system that uses accessible and integrated information technologies. Furthermore, any capital investment in infrastructure needs a revenue commitment to underwrite it, as Local Authorities continue to reduce bus subsidies this is likely to necessitate the need for partnerships with external transport providers.

What cost-effective infrastructure investments in city-to-city connectivity could address these weaknesses? We are interested in all modes of transport.

21. In developing city-to-city connectivity we believe it is right that the commission looks at transport holistically, rather than individual services. It is our belief that it is necessary to significantly invest in public transport solutions that incorporate passenger preferences toward multi-modal, and integrated transport solutions. As transport consultants Frost and Sullivan point out this vision of increased public transport use is:
22. “realised by a convergence of four main mega trends that are being continually tracked by Frost & Sullivan research teams – urbanisation leading to an increasing population density and potential for new mobility business models, social preference changes, rapidly advancing technological developments revolutionising mobility, and smart governance to enable the legislative framework for social innovation in transport to flourish.”²
23. It is our belief that a cost-effective means of ensuring city-to-city connectivity is ensuring travel permits cover a broad geographical area, and a number of services. Clearly, if travel permits include trains, buses, and community transport operators people have a greater opportunity for a lower economic cost to travel between cities. As mentioned above investment in transport shows a generous economic reward to towns and cities and as such would be a cost-effective way to increase city-to-city connectivity.
24. The Chancellor has committed to building around 1,300 miles of additional road surfaces, as highlighted in our blog we believe that developing road infrastructure is important in increasing connections between cities³. It is a concern that the vast majority of transport infrastructure funding is being directed toward London, coupled with local authority cuts there is the possibility that northern cities will not see any improvement in city-to-city connectivity. In this light we believe that investment in better roads between northern cities is an obvious but important starting point. In addition to this we believe that there are benefits to providing financial encouragement for vehicles that carry multiple passengers to travel between cities.

² https://www.hitachi.eu/en/sib/whitepapers/downloads/whitepaper_002.pdf

³ <https://ctauk.wordpress.com/2015/11/30/autumn-statement-transport/>

25. Finally, it is important to consider digital infrastructure as integral to overall infrastructure investment. Personal devices are increasingly being used for planning journeys, buying tickets and providing users with flexible travel information. As these technologies advance it is necessary that digital infrastructure provides reliable, informative, and flexible travel information in order to optimise passenger travel experience.

What form of governance would most effectively deliver transformative infrastructure in the north, how should this be funded and by whom, including appropriate local contributions?

26. We want to use the new impetus for greater integration arising from the Buses Bill to lead to the community having a greater say over what their local transport is like and, where they can, design their own transport solutions with accessibility and inclusivity built into them from the beginning.

27. We believe that governance arrangements should be responsive to the needs of vulnerable and isolated people and communities have not been always been at the forefront when public services and infrastructure have been designed. This includes older people, disabled people, those with long-term conditions, those living in social isolation, those who cannot access employment, education or training. As community transport operators have unrivalled insights into the broad range of needs and issues affecting these groups they would provide an ideal source of intelligence to inform the governance process and should be involved in it in some way.

28. In ensuring this can be achieved we believe that there should be a statutory duty on those charged with developing infrastructure in the north to ensure that community needs are considered from the design stage onwards.

London's Transport Infrastructure

29. Much of the discourse about transforming how transport is run in the north of England has been described as giving those areas "London-style powers". This is a reference to the perceived benefits for the public and passengers of the considerable powers Transport for London (TfL) to shape the transport system in the city region. Indeed, David McNeill, Director of Public Affairs and Stakeholder Engagement at TfL, spoke at length at our recent Westminster Conference about how London's experience with devolution and how its status as an integrated transport authority has enabled it to provide high quality and accessible transport for Londoners.
30. That said, we know that many people remain vulnerable and isolated with Greater London. Difficulties making the first or very last part of an entire journey might prevent them from ever benefitting from large-scale transport infrastructure improvements. Even if they can access the mainstream transport network over-crowding on some modes of transport makes it a daunting experience for some groups in the community.
31. We also know, however, that there is a vibrant community transport network across the capital filling gaps in mainstream services and meeting unmet needs and we know its work is understood and valued by TfL. Many of the social and economic benefits of ensuring community transport is part of the conversation about transport infrastructure, which we described in relation to the north of England, would also apply in Greater London. Indeed community transport operators in London have led the way in developing a robust methodology for demonstrating the social value of their services which will be published in January 2016.
32. The CTA would therefore wish to see these organisations with their unique insights into the lives and transport needs of vulnerable and isolated people fully included in the debate about economic and social challenges facing London to ensure that transport is as accessible and inclusive as it can be.



Sir Merrick Cockell
Chair of the Crossrail 2 Growth Commission
Crossrail 2
PO Box 72284
London
SW1P 9PB

17 December 2015

Dear Sir Merrick,

CBI London welcomes the opportunity to respond to the Crossrail 2 Growth Commission's consultation.

Across the UK, the CBI speaks on behalf of 190,000 businesses of all sizes and sectors which together employ nearly 7 million people, about one third of the private sector-employed workforce. In London, infrastructure investment is a key business issue and a recent CBI/ CBRE survey found London's transport infrastructure as the top priority for firms ahead of the mayoral 2016 election¹. In addition 94% of businesses see the quality of infrastructure as a decisive factor when planning future investment². Ensuring Crossrail 2 is developed so that it supports businesses as well as passengers creating homes, jobs and prosperity is therefore key.

The strategic role of Crossrail 2

Do you agree with the analysis of national/ regional economic trends which are integral to Crossrail 2's business case?

As some employees move further out of the city, reliable commuter routes to bring them into work are key

As some employees are forced to move further out of the capital due to rising housing costs, getting people from London's outer regions and from the wider country into London quickly and affordably is key. Increasing house prices are negatively impacting firms' ability to recruit and retain staff and the CBI/ CBRE London Business Survey found 32% of businesses saying that they are unable to offer flexible part-time employment due to the time/cost of the commute into London for employees who cannot afford to live locally. Similarly almost a third of firms said that employees are moving away from the local area and therefore having to leave their jobs as housing costs are too high. Transport connections are vital for commuters and Crossrail 2 will play an important role in facilitating these journeys.

Crossrail 2 needs to be viewed as a 'national' project

Highlighting the regional and national benefits of Crossrail 2 and ensuring the project supports the whole of the UK whether through transport links, jobs or supply chains is vital in getting public buy in to the project.

Crossrail 2 should be seen as a national project, supporting both the regions and the capital. Whilst the line will service greater London, it will also free up space on our national rail lines, indirectly supporting towns

¹ CBI/ CBRE London Business Survey 2015

² CBI/ AECOM Infrastructure Survey 2015

and cities such as Cambridge, Southampton and Woking. Crossrail 2 will also play a vital role in providing seamless connections from the new High Speed Rail line. 70% of high speed rail journeys will either start or end in London and so new infrastructure to support the influx of passengers will be vital.

The development of the line should benefit the regions through job creation and supply chains something that Crossrail was successful at doing.

Do you support a key objective of Crossrail 2, which is to ‘accommodate housing growth and regeneration across London and surrounding regions’?

Last year CBI London’s consultation response to the 2050 Infrastructure Plan argued that it was essential that our housing needs are incorporated into our wider infrastructure plans, with one of the key objectives of the plan being to unlock housing growth via infrastructure investment. Businesses cite ‘silo working’ as a key frustration and so we therefore welcome this objective of Crossrail 2 and would be keen to work with the commission to understand how we can accommodate housing growth and regeneration across London and surrounding regions. Almost 60% of businesses said that enhancing the housing offer including quality and affordability was a top priority for them ahead of the mayoral elections. Ensuring this Crossrail 2 helps to develop our housing offering is therefore key.

The local opportunities offered by Crossrail 2

To what extent is additional supporting infrastructure required to capitalise on the growth that Crossrail 2 could unlock?

As well as developing the new Crossrail 2 line, Transport for London must continue with investment across the wider tube network. Crossrail 2 will be just one line a commuter may use as part of a wider journey. We must ensure that journeys’ are seamless with a high quality user experience felt across the whole network. There will be little point having a good quality, fast Crossrail 2 if the onward tube connections are prone to signal failure, over-crowding and delays. Constant upgrades and developments must be factored in as a priority.

Resilient digital infrastructure and technology is key in supporting the opportunities that Crossrail 2 could provide

Investment in our digital infrastructure and ensuring our digital connectivity is resilient will be crucial ahead of the development of Crossrail 2. The successful running of these new trains will rely significantly on digital signalling. Ensuring we invest in good quality digital technology will therefore be fundamental to how well the new line operates.

Successful delivery and potential barriers

What potential do you think Crossrail 2 has to strengthen the employment market in your area of interest? Are any external factors needed to maximise Crossrail 2’s beneficial impacts?

Working with local leaders will ensure the project complements local growth strategies

The CBI has previously highlighted how national infrastructure projects must be integrated with local regeneration plans – this should apply to Crossrail 2 also. In order to get maximum bang for the buck that will be spent on Crossrail 2 we need to ensure that the project (local stations) are aligned with local priorities so that the full benefits are realised. It is vital that when choosing the location of stations, local council leaders are fully involved in the decision making process and can ensure that the plans will complement and enhance

growth strategies for the area. This will ensure that housing, jobs and growth will go hand in hand with the new station locations.

Crossrail 2 has the potential to boost local skills

Crossrail 2 has a key educational role to play in the local areas that it will impact. A concerted effort is required from businesses, government and other stakeholders to foster a long term culture of skills development to maintain progress towards Construction 2025, the industrial strategy for the sector. Many firms tell us their concerns regarding a lack of a talent pipeline in the sector. Crossrail 2 can help to encourage the future work-force by engaging them throughout its development.

Using digital connectivity to boost user experience

As route plans are made for the new line, Crossrail 2 must also outline how they plan to utilise 'smart' technology to boost user experience and passenger satisfaction. Smart technology has the ability to join up transport journeys with other transport suppliers and will enable real time information for passengers to make informed journey decisions. Not only would this help to improve journey experience, but it could also help reduce congestion across the network.

What are the most significant barriers to achieving any additional development opportunities that might come forward as a result of Crossrail 2?

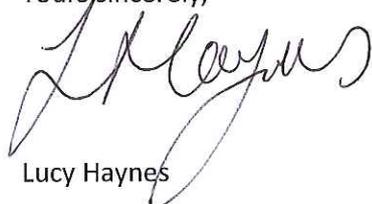
Joined up working is key to the development and success of this project. The Greater London Authority and Transport for London must engage early on with local stakeholders, businesses and local people to understand the additional development opportunities that might come forward as a result of the project.

A lack of investment in our digital connections will also negatively impact on the project. Ensuring we have quality and reliable digital signalling for the trains to operate effectively will be key.

CBI London would be delighted to discuss any of these points with the commission in greater detail.

Thank you for the opportunity to feed into the review,

Yours sincerely,



Lucy Haynes

CBI Director, London

Introduction

1. The County Councils Network (CCN) represents 37 English local councils that serve counties. CCN membership includes both upper tier and unitary councils who together serve over 25 million people across 86% of England. CCN develops policy, shares best practice and makes representations to government on behalf of this significant proportion of the country. CCN is a member-led organisation which works on all party basis and seeks to make representations which can be supported by all member councils. CCN welcomes the opportunity to respond to the consultation, and would also direct the National Infrastructure Commission (the Commission) to the responses submitted by our individual member authorities.
2. CCN councils account for 41% of England's GVA, a combined output of £527bn. Reflecting this county areas are also the nation's most significant contributors to the Treasury. County economies represent a very healthy mix of occupations – they have above average levels of skilled trades, managers and senior officials and private sector employment. Additionally the largest proportion of active enterprises in the country can be found in counties, the total number of which currently amounting to well over a million. To ensure that these opportunities are maximised we argue that the National Infrastructure Commission (the Commission) and government must work with county areas, alongside cities, to develop national infrastructure strategy and secure investment.
3. Within this submission CCN express our disappointment that the work of the Commission, leading into the 2016 Budget, will focus on London and big city regions. We set out a number of recommendations which would give a broader basis for the work of the Commission, to ensure that vital economic opportunities presented by county areas play a key role in national strategy.

The remit of the Commission – investing in counties and cities

4. Ensuring the right strategic infrastructure is in place will be key to the future economic health and competitiveness of the country. CCN therefore welcome the formation of the independent National Infrastructure Commission (the Commission) as a permanent statutory body. Government has an important role, working with local areas, to prioritise nationally important schemes, make capital available, encourage private and international investment and enable areas to raise investment in innovative ways.
5. The overarching role of the Commission is described as carrying out 'independent and unbiased assessments of the UK's long-term infrastructure needs ... to give clear strategic direction to industry and government and provide a firm basis for planning and investment.' The Chancellor has asked that the Commission undertake this role through five yearly National Infrastructure Assessments (NIA). In support of the first NIA the Chancellor has asked the Commission to propose some initial schemes for in-depth analysis in early 2016.
6. CCN welcome the introduction of NIAs, as they should ensure greater certainty for private investors, and provide greater assurance to local authorities and the development industry that

growth is deliverable in a sustainable manner, supported by existing and planned infrastructure. **We strongly suggest that the Commission thoroughly engage with the robust and evidence based priorities of counties in drawing up their NIA, and in making initial proposals for in-depth analysis in early 2016. CCN would be happy to facilitate and support such engagement.**

7. Additionally the Chancellor has written to Lord Adonis, Interim Chairman of the Commission, explaining that the Commission should concentrate its initial focus on three key areas; northern connectivity, London's transport infrastructure, and energy. As these are considered by central government to be the most pressing for the national economy, and these initial investigations will influence the 2016 budget. The Chancellor has issued the Commission detailed terms of reference for these first three projects.
8. CCN would like to express their disappointment that the work of the Commission has been so limited in the scope of its initial investigations, which will inform investment and priorities of the 2016 Budget. These initial inquiries focus entirely on London and the northern cities, without any regard to the rest of the country, except through references to 'commuter hinterland'.
9. We suggest that limiting the scope of these inquiries in such a way is not in the best interests of unbiased assessment of the UK's long-term infrastructure needs. We argue that strategic infrastructure investment is as pressing in county areas as it is city areas, that cities and counties function together, and that county regions represent substantial economic opportunities which must not be overlooked. These points are explained in further detail through this submission.
10. To address these points **we strongly recommend that the Commission takes a comprehensive, country-wide approach in making recommendations through its initial investigations, to inform the 2016 Budget. We urge the Commission to carefully consider the evidence put forward by CCN members to these initial inquiries, and broader evidence established through Strategic Economic Plans and other mediums to help inform this.**
11. **We also suggest that the Commission commit now to undertaking specific detailed inquiries into investment in county infrastructure as part of its next tranche of analysis and recommendations.**

Achieving our shared devolution goals

12. CCN share government's goals to devolve functions and financial freedoms, to bring decisions closer to the people and business they affect and to stimulate economic growth. To support this we must ensure that the Commission takes a localist approach and does not inadvertently centralise powers and decisions. Equally we must ensure that the work of the Commission and of government considers the economic opportunities in all areas and does not disenfranchise swathes of the country.
13. We note that government consider regional transport partnerships / Sub-National Transport Bodies to be an important stakeholder in the work of the Commission. We believe that in principle this is supportive of the devolution agenda. For example we are pleased to note that in its inquiry into infrastructure in the north the Commission will work closely with Transport for the North (TfN) to establish and evaluate options for investment.

14. We are also pleased that Sub-national Transport Bodies will involve joint decision making between the local elected representatives and businesses, the Department for Transport, Highways England and National Rail. These factors represent meaningful devolution and public service reform, which we hope will evolve over time.
15. To ensure that the best value is derived from these approaches **we strongly suggest that where counties wish to be a part of regional transport partnerships / Sub-national Transport Bodies they are encouraged to do so, and that government publically commits to promoting and listening to the important voice of counties alongside cities within these arrangements.**
16. In summer 2015 the Chancellor stated that TfN would be underpinned by 'devolving far reaching powers over transport to the North's Mayor-led city regions to deliver fully integrated public transport systems'. We must evolve this approach and ensure that the important economic and logistical hubs represented by counties are equally empowered, and able to contribute to regional growth. **We strongly suggest that transport and growth powers and budgets are devolved to counties where there are rigorous and appropriate governance measures in place and without a pre-requisite for metro mayors.**
17. In this context we are pleased that there has been a broadening of the membership of the TfN Partnership Board in recently months, beyond a city region focus to involve more county partners in the area. We would expect to see the role and voice of counties in such arrangements to growth over time, and would expect the Commission to fully consider the views of counties in its engagement with Sub-national Transport Bodies and individual areas.
18. **Where formal regional transport partnerships / Sub-national Transport Bodies are not in place, we still suggest that the Commission strive to engage groupings of local areas to help establish and appraise investment options put forward to government. CCN would be happy to facilitate such an approach.**

Counties role in sub-national transport and infrastructure governance

19. Counties are ready to take a lead role in driving sub-national transport and infrastructure, with local, national and international partners. Beyond the TfN example above counties have also been heavily involved with their city partners in the creation of Midlands Connect. This initiative has been promoted by Ministers and the Chancellor as a vital aspect of the 'Midlands Engine' for growth. We believe that Midlands Connect will play a key role in the infrastructure, transport and growth of the area, and would expect the Commission to engage with the board, in the same way they will engage with TfN.
20. Elsewhere in the country counties have come together to found England's Economic Heartland partnership. It is intended that this partnership will drive innovation in the area, as well as effective transport and infrastructure strategy. Forums such as this would be the logical point of contact for the Commission going forward, and help ensure that infrastructure opportunities from all parts of the country are considered.
21. In response to the national infrastructure, Sub-national Transport Body and devolution agendas more groupings of counties, counties and cities, or large county areas may begin to formalise sub-national transport arrangements. We must ensure that a one size fits all approach is avoided and that all areas have the chance to take on powers and influence national strategy.

The importance of county economies

22. To give a sense of scale, counties cover 86% of the landmass of England, they represent 47% of the country's population and are responsible for 70% of maintained roads. The combined population of counties now stands at 25.5m, and has grown 2.6% between 2010 and 2014, compared to 2.5% in metropolitan boroughs. It is estimated there are 10.6m households in CCN member councils, which is projected to rise 18% to 12.8m by 2037.
23. Using the latest data (2013) the economies of the areas served by the 37 CCN councils accounted for 41% of England's GVA, up 1% from the previous year, with a combined GVA of £527bn. This is strong performance compared to other areas of England. Further analysis of GVA growth since the recession shows that outside of London counties have seen the largest growth - 36% of GVA growth compared to 13% in the Core Cities. Equally county areas are the nation's most significant contributors to the Treasury. The latest breakdown of income tax receipts show that county populations contributed £66.4bn, which is 49% of all income tax in England and contributed 41% of all residential stamp duty.
24. County economies represent a very healthy mix of occupations – they have the highest levels of skilled trades in the country, above average levels of managers and senior officials and are only behind London for levels of technical jobs. Outside of London CCN members also have the highest levels of private sector jobs, and in counties the proportion of private to public sector jobs is steadily growing over time.
25. Additionally the largest proportion of active enterprises in the country can be found in counties, the total number of which currently amounting to well over a million. Outside of London counties hold by far the largest number of businesses created per 10,000 of population. There are countless FTSE 100 company headquarters based in county areas, to name a handful BAE Systems in Hampshire, National Grid in Warwickshire, Next in Leicestershire and Experian in Nottinghamshire.¹ Underlining this the Independent Commission for Non-metropolitan England stated 'Internationally mobile firms overwhelmingly choose non-metropolitan areas, not conurbations, as their base if they don't choose London'.
26. We argue that securing the national economy must take a broader view than simply connecting city regions together. Evidence is showing that county regions are growing faster than city regions and that the scale of business undertaken in counties is substantial. Equally evidence is showing that county areas are some of the most innovative² and that specialisation can be equally, if not more, successful outside of big city areas.³ We must ensure that infrastructure links cities and counties across sub-national areas and that business and commuting links for counties are built into infrastructure plans.
27. Rural areas, the majority of which can be found in counties, are set to become ever more important to the national economy according to DEFRA. A report of late 2014 found a net migration from urban to rural areas in England, stating 'whilst in many OECD countries there has been a trend towards greater urbanisation, the UK has been experiencing net migration from urban to rural areas'. This strengthening of the rural economy is associated with innovation, knowledge-based industries and a strong entrepreneurial make up. DEFRA conclude 'if harnessed, these trends could help drive significant growth in productivity, employment and output ... for the UK economy' and 'could offset aging demographics ... in such areas'.⁴

¹ The Independent Commission for Non-metropolitan England, Devolution to Non-metropolitan England : Seven steps to growth and prosperity, Final Report of the Non-metropolitan Commission, March 2015

² DEFRA, How increased connectivity is boosting economic prospects of rural areas, December 2014

³ Respublica, The Missing Multipliers: Devolution to Britain's Key Cities, September 2014

⁴ DEFRA, How increased connectivity is boosting economic prospects of rural areas, December 2014

28. Echoing these points the Independent Commission for Non-metropolitan England stated that 'non-metropolitan areas' high skills base positions them well for a world where trade is increasingly blurring the line between goods and services. They have an edge in knowledge intensive sectors, where getting people around the globe easily can be as important as moving goods ... Future transport investment decisions will be informed by local and global connectivity, including the role of regional airports in accessing global markets'.⁵
29. Many ports, freight routes, airports and logistical hubs sit within counties. These gateways to international markets must play a central role to infrastructure strategy and not just an afterthought as means of moving goods in and out of cities. Logistical hubs and routes present important economic opportunities in their vicinity, alongside their broader reach.
30. Alongside cities English counties have strong identities, commodities and brands which attract international attention. This is borne out by the number of FTSE 100 companies based in county areas, but has huge potential to continue to grow. Counties are iconic to British life and business; they represent the land and the mix of business and lifestyle opportunities which are attracting big business. They have the high value skills base and growing track record of innovation and specialisation to service start-up, growing and international business – we must ensure that physical and digital infrastructure keeps pace with this and helps the nation grow.

Capacity for improved productivity and growth

31. Despite counties' strong and vibrant economies delivering growth, employment and taxes for UK Plc, productivity remains a long-term weakness. Figures for counties show that their average productivity is 91, compared to the UK 100 Index. This is considerably below the London average of 122, and also the Core Cities average of 94.
32. A key factor in addressing this productivity gap is the right strategic infrastructure interventions. With this in mind central government and the Commission should work with county areas to secure investment in infrastructure priorities and devolve growth, infrastructure and transport powers. CCN have calculated that if counties were enabled to raise their productivity to the national average, this could contribute an additional £100bn to the UK economy.

The ability of local areas to invest in infrastructure

33. Alongside the devolution of transport, infrastructure and growth powers and budgets mentioned earlier in this submission CCN strongly suggest that national and sub-national growth will be maximised by equipping all areas with the fiscal tools they need to invest in infrastructure.
34. Greater London, and now Greater Manchester are able to raise a region wide CIL to fund strategic infrastructure projects. Equally the Chancellor has proposed that those areas with a metro mayor are able to increase Business Rates. CCN strongly argue that such powers must be extended beyond big cities, and must not be arbitrarily connected to the mayoral model of governance. **We strongly suggest that county areas are equipped with a full suite of fiscal freedoms, so that their businesses and residents are able to decide what measures are put in place to invest in strategic infrastructure projects.**

⁵ The Independent Commission for Non-metropolitan England, Devolution to Non-metropolitan England : Seven steps to growth and prosperity, Final Report of the Non-metropolitan Commission, March 2015



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8/1/16

To Whom It May Concern,

Please find below my submission to the National Infrastructure Commission's call for evidence in relation to London's Transport Infrastructure.

Yours sincerely,

Rt Hon David Lammy MP
Member of Parliament for Tottenham

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

London faces a wide range of economic and social challenges like any metropolitan city. But there are three specific areas where the challenges are so great that urgent action is required.

HOUSING: The housing crisis has been well documented, yet since 2010 no politician has implemented real solutions, either at national or mayoral level. Shortage of supply, driven by very low levels of house building, plus soaring demand, mean that the average property in my Tottenham constituency now costs more than £350,000, with prices up almost seven per cent in the past year. This not only means that far too many people will be denied the dream of home ownership; as prices and rents rise ever higher, it will also start to damage London's economy, as workers from all sectors and at all skill levels are priced out of the city's Labour market.

ECONOMIC DEVELOPMENT: We also need economic development and new jobs in relatively deprived areas such as Tottenham. The prosperity of the City still masks the acute problems for some people in my part of north London. Economic development here and elsewhere in London within commuting distance and north into the Stansted-Cambridge corridor is essential.

TRANSPORT: Clearly the pressures of population growth on the transport network are closely related to both housing and economic development. In Tottenham, pressure on the Victoria line and on rail services lengthens commutes for my constituents, causes delays and makes their journeys more crowded and stressful. Better transport systems would drive growth and jobs, as well as unlocking

significant new housing development and importantly would greatly improve the quality of life for many of my hard working constituents.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

I write this consultation in my role as Chair of the All Party Parliamentary Group on Crossrail 2. London needs full funding of its transport network – not the latest round of cuts imposed by the Chancellor. We need proper funding guarantees for Tube upgrades, including the Piccadilly Line, which some people in the western part of my constituency depend on. We also need network rail to upgrade the West Anglia Main Line to improve capacity, resilience and frequency across the area.

However, such transport projects alone will not be enough. Even though Crossrail will add around 10 per cent to the capacity of London's transport network when it opens from late 2018, we need a similarly transformative project to cope with the increase in demand a decade and more beyond that. Crossrail 2 is the obvious answer, and indeed the only scheme currently proposed which delivers a similar step-change in capacity. We need to get moving on making Crossrail 2 a reality.

Infrastructure should enable growth, and therefore projects should be assessed on their ability to payback the original investment. Static assumptions about how a place will function in future have been debunked by the Jubilee Line extension which transformed Canary Wharf. Our assessments should focus instead on a project's ability to create jobs, grow the economy and generate new tax receipts, allowing us to develop a more realistic view of the benefits of infrastructure investment. This would support investment not just in London but in other cities around the UK too.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

The benefits of Crossrail 2 could be maximised by the project working closely with the boroughs and with local communities to make sure that it helps deliver the kinds of increased numbers of homes – and jobs – that it is capable of. We need to strike a balance between preserving communities and allowing development which makes their futures viable in a London of 10 million people.

In addition, it is vital that while Crossrail 2 will inevitably cause disruption to communities while it is being constructed: we must listen carefully to the communities affected about the impact the disruption will have and respond to those concerns where possible.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

Delivery of Crossrail 2 and other large projects in London needs first of all to be as speedy as possible. We can't afford to delay the project any longer: we just need to get moving. The transport network is already under strain and even on the most optimistic projections, Crossrail 2 will not be in operation for another 15 years. Starting construction as soon as possible will mean lower prices, avoiding costly construction inflation.

That delivery can be ensured in the first instance by awarding the scheme substantial development funds in order to complete technical development and get planning consents through Parliament

before 2020. The majority of the wider funding package is already predicted to come from London, including contributions from the business rate supplement and Community Infrastructure Levy. I would like to see this augmented by fair devolution of business rates, as signalled by the Chancellor this autumn, and by radical new measures such as, for instance, the hypothecation of Stamp Duty in the capital, or a portion of it, for London to spend on such projects. Infrastructure projects such as Crossrail 2 have the potential to make a huge contribution both to the UK economy and to Treasury revenues, and funding of them should reflect that.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

I would like to see Transport for London take a more aggressive approach to using the profits of development to fund transport improvements, on the lines of that taken by Hong Kong metro operator MTR. Developers along Crossrail's route, for example, have already made a killing: we should be capturing much more of that to fund the transport projects transforming property values. But we also need to take a more long-term view of transport investments, as for example Paris does. There, the ambitious Nouveau Grand Paris project for extension of metro and suburban rail lines has funding for decades into the future, allowing much better planning – and value for money – of this kind of fundamental investment in the city's future.

National Infrastructure Commission call for evidence

Connecting Northern Cities and London's Transport Infrastructure

Submission from DB Schenker Rail (UK) Limited

January 2016

1. This is the response of DB Schenker Rail (UK) Limited (DB Schenker) to the call for evidence issued by the National Infrastructure Commission (NIC) in November 2015.
2. DB Schenker is the largest rail freight operator in the UK and is a wholly owned subsidiary of Deutsche Bahn, the second largest mobility and Logistics Company in the world. DB Schenker operates over 5000 trains per month in the UK conveying everything from cereals to coal, consumer products to biomass, petroleum to steel and is the leading rail provider to the construction industry in the UK. DB Schenker employs over 3300 people in the UK providing freight, infrastructure, rail support and charter passenger services within the UK and freight services to and from continental Europe via the Channel Tunnel.
3. DB Schenker, in common with other rail freight operators, is a wholly private sector activity receiving no material direct government support in the UK. In a heavily-capital intensive industry, DB Schenker owns and operates its own assets, including depots and rolling stock, and has invested heavily in new locomotives, wagons and facilities since UK privatisation.
4. DB Schenker's response is in four parts – general observations about the value and characteristics of rail freight, a description of the current demand forecasts for rail freight, observations on current government policy and rail freight's specific infrastructure needs and how these relate to two of the three national challenges set out by the NIC.

Rail Freight

5. Rail freight is a wholly private sector activity determined by customer and market needs. In this respect it is different to passenger rail and rail freight has a very different, less direct, relationship with Governments, funders and other devolved bodies as a result.
6. Rail freight generates over £1.5bn of economic benefits for UK plc every year through a combination of improved productivity, reduced congestion and wider environmental benefits. It is vital for the competitiveness of the UK economy and is an intrinsic part of everyday life in the UK.
7. Rail freight transports goods worth over £30bn pa, moving over 25% of the containers entering the UK and underpinning industrial sectors such as power

generation, construction and steel. Rail is a key supplier to UK manufacturing sectors such as the automotive industry and a major supplier to Network Rail and other Infrastructure Managers.

8. Rail freight has transformed itself since privatisation in the mid-1990s into a competitive and vibrant industry, recognised by the CEO of the Office of Rail & Road as “the most transformed sector in the rail industry since privatisation”. Total volumes increased by over 80% from 13.5bn ntkms in 1995 to 24.4bn ntkms in 2013-14.
9. The sector is changing as the UK economic base itself shifts, with reductions in traditional rail freight markets such as moving coal to power stations - where Government environment and other policy choices are driving conversion to biomass, renewables and other forms of electricity generation. Alongside this is an increase in the volume of containers moved for the growing retail/consumer sectors.

Continued rail freight growth will increasingly focus on the retail, construction and international sectors reflecting the general change in patterns of the UK economy.

10. This will have geographical as well as sectorial implications, as the concentration of the UK’s population south of a line from the Humber to Lancashire means that this will become increasingly significant for rail freight. Ensuring sufficient usable rail capacity is available south of this line to allow rail to compete with road will be more complex than ever over the next decade.
11. Rail freight is an intensely competitive industry – both within the mode and with road transport in particular. This strong competition has driven efficiencies, lowered prices to customers and reduced the costs of operation. The drive for longer and heavier freight trains is one example of how this has been achieved. In the decade after 2002/3 the number of freight trains on the network reduced by over 33%, whilst volumes increased by 17% - this meant (taking distance into account) that each freight train increased its cargo carried by over 50%.

These pressures will continue and the sectors offering the most volume potential for future rail growth are also those with the strongest price and service competition with road transport.

12. Intrinsic to maintaining rail freight growth and development will be continued private sector investment. Investment in rolling stock and facilities by freight operating companies such as DB Schenker is clearly understood - over £2bn has been invested by FOCs since privatisation.

In addition over £500m has been invested by Government (including EU funding) in Control Period 4 on freight specific network enhancements. In addition, a further £230m has been planned for Control Period 5 freight specific network enhancements by the UK Government and Transport Scotland.

Freight customers and suppliers - including ports and terminal operators have also invested heavily in rail freight facilities - over £250m in the last decade on port-related rail infrastructure alone. Investment in new rail-connected warehousing and terminals is critical for future rail freight growth.

Ensuring the private sector has the confidence to continue to invest to support rail freight - and rail freight growth in particular - should be a key consideration.

13. Rail can move freight in greater volumes, more safely and reliably than road transport. Each freight train removes up to 75 HGVs from the UK's roads – without rail freight over 7.5m additional road journeys would have been needed. Transporting freight by rail reduces CO2 emissions by 76% compared to road.
14. Rail freight operates in *response* to specific customer demand - a key distinction from passenger where services are planned in *anticipation* of demand. Many trains are customer-specific rather than multi-customer - so if a customer does not require a service on a particular day or week it will neither be scheduled nor operated. Rail freight's use of capacity is therefore often very different to that of passenger operators.
15. Both railway and political devolution pose challenges for national activities such as rail freight – for example in how an appropriate balance will be made between local/regional and national requirements/priorities in ways that best support both regional and national economic activity and growth.

Freight Market Study and demand forecasts

16. In October 2013 Network Rail published a Freight Market Study (FMS) as part of its Long Term Planning Process that (inter alia) contained growth forecasts for 2023 and 2043. These suggested that further rail freight growth of 2.9% until 2043 was possible. Government accepted that these forecasts were robust and should be adopted for planning purposes.
17. Crucially these were an *unconstrained* set of forecasts - i.e. current or anticipated future constraints were not taken into account.
18. In reality the railway is already constrained in many locations –e.g. the Midland Main Line which Network Rail has formally declared as “Congested Infrastructure” and for which there is increased current and forward demand for rail freight services. There are also well-known bottlenecks and capacity pinch points (such as the Felixstowe branch) that are inhibiting freight growth and development today.
19. The FMS forecasts were based on a series of key assumptions - two notable examples being the price of oil and its impact on road haulage costs/economics & the ability of the UK Planning system to enable necessary Strategic Rail Freight Interchanges (SRFIs).
20. The output of the FMS was consistent with previous studies in suggesting future growth will be concentrated in a relatively few key economic sectors - including Intermodal (the movement of goods in containers for both industry and the retail sector), Automotive, Construction (aggregates, other building materials and spoil/waste) and International (via the Channel Tunnel).

21. The FMS forecasts reflect the changing nature of the UK economy as it continues to develop and move away from traditional “heavy” industrial sectors such as coal and steel to a more service orientated composition which relates more closely to where people live and work.
22. Historic rail freight infrastructure provision reflected the role rail freight played between the 1960s and the 1990s; this has meant that the growth in intermodal traffic has driven the need for enhancement of rail infrastructure in other geographic areas, often in parallel with growth in passenger traffic.
23. The forecasts also highlight the critical and growing role of ports in the rail logistics chain; suitable and sufficient infrastructure connectivity to/from ports is critical for rail freight to be able to support the role the UK economy plays in global economic activity.
24. Appropriate connectivity between key UK ports and the main centres of UK population and economic activity is now a key imperative for future rail freight growth and the associated current (and additional) benefits for the UK economy.

This is where Government’s role - in terms of both policy support and funding - is key.

25. Alongside this, it will be necessary for continued investment in rolling stock and SFRIs (which will need to encompass both rail connected terminals + rail connected warehousing). The private sector will be willing to continue to invest in such facilities (both Freight Operating Companies such as DB Schenker and third parties) if both the investment climate and levels of political/regulatory risk are acceptable.

Government Policy and Rail Freight Infrastructure needs

26. The 2007 Rail White Paper defined the Strategic Railfreight Network (SFN) as “a core network of trunk freight routes, capable of handling more and longer freight trains, with a selective ability to handle wagons with higher axle loads and greater loading gauge, integrated with and complementing the UK’s existing mixed traffic network”.
27. The subsequent 2007 publication “Strategic Rail Freight Network - the Longer Term Vision” - was the then Labour Government’s expression of a long term rail freight policy. This policy was subsequently explicitly continued by the Coalition Government who (together with associated EU funding) invested over £0.5bn in rail freight infrastructure enhancements in Control Period 4.

The present Government is currently reviewing and reforming its rail freight policy.

28. Since 2007, UK rail infrastructure planning has adopted the central themes of the SFN;
 - a. Longer and heavier trains – with the standard length for intermodal trains becoming 775m;

- b. Efficient operating characteristics;
 - c. 24/7 capability;
 - d. W10/W12 gauge capability (including W9 gauge if Channel Tunnel traffic is involved);
 - e. New freight capacity where required;
 - f. 25kv AC electrification of freight routes (which provides opportunities for gauge enhancement as well as electric haulage).
 - g. The development of SFRIs, supported by the National Networks and Ports National Policy Statements;
 - h. Strategic Freight Capacity to protect necessary train paths.
29. These features remain relevant and usually form the starting point of rail freight infrastructure planning. This should continue to be the case, but the themes need regular review to avoid ossification.
30. European railways are already researching the feasibility of freight train lengths of 1500m on selected European mixed-traffic routes, and it is well known that North American practice remains to operate freight trains that are significantly longer than 775m.

Connecting Northern Cities

31. Northern cities are already important destinations/origin points for intermodal and other traffics to/from ports and the Channel Tunnel, with established services to & from key ports such as Southampton, Felixstowe and London Gateway (the three ports that currently dominate UK links to many global supply chains).
- Much of the Control Period 4 and 5 rail freight expenditure / plans have been targeted at improving gauge capability and limited capacity additions on routes to/from these ports. Some of the CP5 plans – for example gauge enhancement between Syston Junction (near Leicester) and Stoke-on-Trent - are currently being re-phased following the Hendy Review.
32. Planning freight trains into some existing terminals (e.g. at Trafford Park in Manchester) is already complex because of the sheer number of other trains at locations such as Manchester Piccadilly.
33. In addition, movements of bulk products such as aggregates and building materials also feature into cities such as Manchester and Leeds, although not to the extent currently seen in London and the South East.
34. The Humber ports – and especially Immingham – are the UK's largest rail freight forwarding locations with very substantial volumes especially of bulk products such as petroleum, coal, biomass and steel.

35. The port of Liverpool, with established rail traffics such as coal, steel and biomass, is investing in a new £300m deep-water container terminal that will double the port's container handling capability and a trial rail intermodal service to the West Midlands has recently been operated.

If the port's aspirations for growth are achieved, it is likely that there will be significant increases in rail freight volumes and these are likely to impact across the north of England and pose significant challenges for the rail sector.

36. Northern cities, particularly in the NW, are central to the FMS growth plans, whether from local ports or more distant ports or regions of the UK. Crucially capacity to accommodate this potential growth is limited/constrained on *all* the key routes.
37. Cross-Pennine transits have become especially challenging. It is not possible to obtain economically viable freight paths during the day on the main Manchester – Leeds route via Huddersfield (known colloquially as the “Diggle” route) and it is increasingly difficult to obtain freight paths on the Calder Valley route via Hebden Bridge.

The main “freight” cross-Pennine route has therefore become the more southerly Hope Valley line between Stockport and Sheffield. This is better located for (e.g.) aggregates movements from the Peak District rather than for intermodal or biomass movements. However access to, and capacity on, this route is not without its own challenges.

38. Studies into options for future cross-Pennine rail options therefore need to ensure that rail freight's needs are taken fully into consideration and that current routing assumptions should not be presumed to be ideal or even acceptable.
39. The West Coast Main Line (WCML) is the UK's principal freight artery, critical for intermodal and international movements and central to the realization of the FMS growth projections. Key elements in achieving this will include;
- a. Securing for rail freight an appropriate share of the capacity on the WCML that will be released after the construction of High Speed Two;
 - b. Ensuring that the introduction of classic-compatible HS2 trains onto the WCML north of the HS2 dedicated infrastructure does not result in a timetable that “squeezes” existing rail freight services or projected rail freight growth;
 - c. Ensuring sufficient connections for rail freight exist between the WCML and existing / proposed SFRIs in the North West.
40. Increased use of rail freight into and through Northern Cities would seem to offer potential additional benefits for customers/users if sufficient capacity could be developed. There would also be wider societal/environmental benefits in terms of a reduction in carbon and other emissions and improvements in air quality.

London's Transport Infrastructure

41. London's current rail freight activity falls into two distinct categories;
 - a. Trains that support the economic activity of London and the surrounding region.
 - b. Transit freight that passes through London because of its hub position in the UK rail network.
42. Very substantial volumes of construction materials are moved into London and the surrounding region and underpin much building and development activity. Trains come from Yorkshire, the Mendip Hills, the Peak District and Leicestershire as well as closer locations on a very frequent basis, conveying aggregates, cement and other building materials.

These are delivered to a network of relatively small single-user rail terminals where the product is unloaded, stored and then distributed by road to building sites. Physical space limitations at these receiving rail terminals mean that frequent rail deliveries are necessary and the operations often have characteristics similar to "just-in-time" deliveries. Many of these terminals also have operating limits imposed as part of planning consents which in turn impedes the relationship with the rail network.

43. In the opposite direction, rail can be an effective solution for the removal of spoil or waste from larger development sites, especially if the material is contaminated or requires special handling. For many years rail has moved containerized domestic waste from London for landfill.
44. Rail freight also provides substantial support for the Automotive industry in the London area, in moving automotive components and on occasion finished vehicles.
45. A notable exception to the commodities handled by rail in London is Intermodal or containerized goods. In part this reflects the proximity of London to the main Deep Sea ports, as well as the Channel Tunnel and short sea ports such as Tilbury and Purfleet. However the lack of any substantial SFRIs or terminals in the London area means that potential domestic intermodal traffics cannot be realized.

Strenuous attempts have been made over the past decade to develop new intermodal rail handling facilities in the London and South East. In particular, potential developments at Radlett and Colnbrook have spent years attempting to navigate the Planning System and being resisted by local authorities and residents at every stage.

46. A network of SFRIs, around London (perhaps in relation to the motorway or trunk road network) are a key requirement for the nation as well as the city/region to realise the economic and other benefits of modal shift to rail.
47. London's proximity to key ports such as London Gateway, Felixstowe, Tilbury and Purfleet also explains much of the transit freight that is routed via the capital. The broadly "hub and spoke" nature of the UK rail network means that there are few

routes between the arterial “main lines” outside of London.

Until relatively recently, some cross-London railways such as the West London Line & Gospel Oak – Barking Line were predominantly freight; however growth in demand for passenger rail services has led to dramatic increases in passenger use of these and other lines such as the North London Line, and increasing pressures between passenger and freight use. These routes are moving toward a very frequent ‘turn up and go’ passenger service which reduces capacity for rail freight services dramatically.

48. In addition, all rail freight services from the Channel Tunnel (whether traveling via High Speed One or Network Rail infrastructure) are routed via London.
49. Almost without exception, there are no alternatives to the current transit freight train routing through London. Development of the route north of Ipswich to Peterborough is aimed at accommodating *some* of the projected freight growth from Felixstowe – but none of the existing traffic.
50. Looking ahead, the volumes of rail freight in and around London will continue to increase.
 - a. The role of rail in moving construction materials will continue – DB Schenker, together with the construction industry, are developing new, larger & more efficient multi-user aggregates facilities at Bow, Cricklewood and Willesden. These will be capable of handling larger trains more quickly and will help to create the capacity required to support infrastructure growth in London. They will increase the product carried per train path into the capital and will provide modal shift potential. It is not clear if the development of these sites will create land capacity elsewhere for development or whether these will be in addition to existing facilities rather as replacements.

Without this movement of construction materials, planned developments and increases in housing supply are also likely to be impeded or frustrated.

- b. Rail will continue to support major infrastructure schemes – for example in the building of High Speed Two and associated developments such as the redevelopment of Euston Station or the Old Oak Common area.

This contribution can be maximized with early engagement within the Pre-Planning / Consultation process so that rail freight can deliver enhanced economic and environmental benefits to projects as proven by in the cases of Heathrow Terminal 5, London 2012 Olympics and Crossrail.

- c. DB Schenker is also investing in a new Railhub for automotive handling adjacent to the junction between Network Rail infrastructure and High Speed One at Barking. This facility will be able to exploit the movement of finished vehicles to and from the UK via High Speed One with its larger loading gauge which will increase the rail options available for use.

This facility will benefit Automotive manufacturers in the London area, but

also others across the UK and has the potential to become a vital node in imports and exports for a key UK manufacturing sector.

- d. When one or more SFRIs are finally opened, the potential for intermodal movements between London & the South East and the North West/Scotland will be significantly enhanced. Such movements are a key part of the forecast growth of the Network Rail FMS.
 - e. In addition, there is potential for rail involvement in “City Logistics” with rail movement of consolidated deliveries for retail outlets to terminal stations or other hubs, and then transshipment to (e.g.) electric or other vehicles for sustainable “last mile” delivery.
 - f. The continued development of London Gateway will also result in increased rail services, most (if not all) of which will be routed via London.
51. Increased rail freight services also offer the potential to reduce carbon and other emissions, improving air quality and supporting improved quality of life.
52. Together with the forecast increases in demand for passenger services, it is evident that much of London’s key rail infrastructure will remain mixed traffic in nature and operating at or near capacity, with potential implications for performance.

Increasing rail capacity in London via physical enhancement is expensive and disruptive; the deployment of ERTMS/ ETCS might offer some relief, but this is uncertain and some years away.

As a minimum, improved planning and co-ordination (within what is possible in competitive markets and customer requirements) would seem advisable.

53. On its own, it is unlikely that any rail freight developments will justify the level of capital expenditure in major infrastructure enhancement – but the benefits of rail freight may well make a substantial contribution to the benefits calculation of any wider business case and it is important that these are always carefully articulated and factored in.
54. Network Rail and other railway organizational forms typically follow the arterial route structure into London and hence cross-London movements such as rail freight will cross two, three or four railway organizational boundaries. It is important that any potentially negative effects of this are avoided as Network Rail devolves more power to its routes; this will be a key task for the System Operator function of the future.

The Benefits of Transport Investment: and why we can't build our way out of congestion

Submission to the National Infrastructure Commission by Dr David Metz, Honorary Professor, Centre for Transport Studies, University College London, formerly Chief Scientist, Department for Transport.

In this submission I offer evidence of the ways in which transport investment benefits individuals and society, in particular how this contributes to economic growth. I compare and contrast the rather different situations of London and the Northern cities.

Long term trends in travel behaviour

The Department for Transport (DfT) commissioned the first National Travel Survey fifty years ago and has repeated this regularly for forty years. Figure 1 shows the key parameters on a per capita basis covering all modes of travel (except international air). Average journey frequency has remained at about 1000 trips per person per year over the period. Average travel time has held steady at around 370 hours a year or an hour a day, a figure found globally for settled populations. What has changed is the average distance travelled, which increased from 4500 miles a year in the early 1970s to 7000 miles by the mid-1990s, since when there has been no further growth.

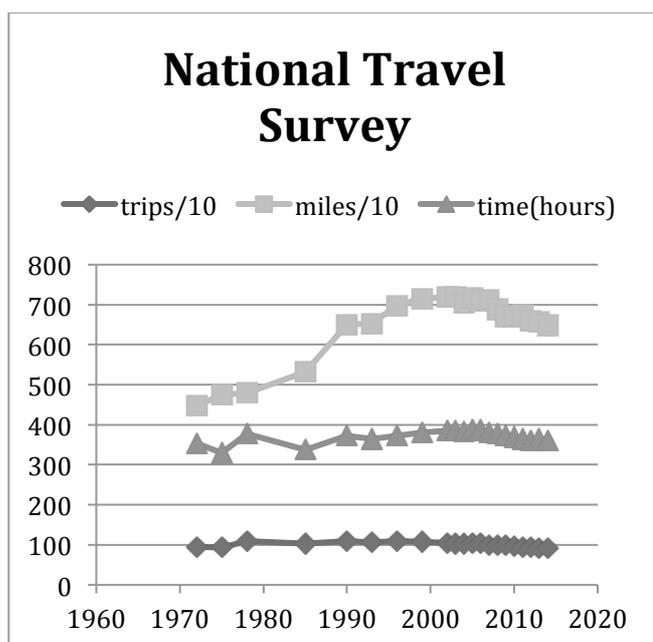


Figure 1 Source NTS(2015)

People have travelled further in the same amount of time because they have travelled faster, the consequence of investment in speedier forms of transport – private investment in cars, public investment in road and rail infrastructure and trains. It is important to recognise that people have taken advantage of higher speeds to reach more distant destinations, not to save time travelling to unchanged destinations. We travel further in order to have more access, opportunities and choices. For instance, by travelling faster on the journey to work, we have more choice of employment accessible from where we live in the time we allow ourselves for commuting, more choice of homes accessible from our workplace, and similarly more choice of shops, schools etc.

Figure 1 shows that there has been no growth in per capita travel for the past twenty years. Growing personal incomes are no longer an important factor in the growth of travel. Rather, population growth is now the main driver of overall demand growth.

Three-quarters of the average distance travelled in Britain is by car, hence we find that the average distance travelled by car has also ceased to grow, starting well before the recent recession. This cessation of growth of per capita car use is found for most of the developed economies for which data is available, a phenomenon known as ‘peak car’. A number of contributing factors have been identified, including less interest in cars by the urban young, changes in company car taxation (in the UK), saturation of demand for access to daily travel destinations, and technological constraints on faster travel (Metz, 2013).

Economic benefits of transport investment

The convention of transport economists, central to the DfT’s investment appraisal methodology, is that the main economic benefit of transport investment can be estimated as time saved through faster travel. Such time savings are valued because they permit more productive work or desired leisure. However, the evidence of the National Travel Survey is that there are no time savings in the long run, as seen in Figure 1, which is in effect an evaluation of the impact of cumulative investment over a forty year period. Time savings are therefore short run and mislead as regards the benefits of investment in long lived infrastructure.

People take advantage of higher speeds to travel farther, which results in changes in land use, development in particular. This is evident in the regeneration of East London, Docklands and beyond, the consequence of public investment in urban rail that has made brownfield land accessible for development by private sector developers who construct commercial and residential properties that accommodate jobs and homes for the city’s growing economy and population. The causal mechanism linking transport investment to economic benefit is via improved access and resulting development.

Notional time savings by those who, for instance, will travel from home to Canary Wharf using Crossrail when opened do not illuminate the case for this investment since these depend on both uncertain forecasts of passenger

numbers and problematic Stated Preference experiments intended to value individuals' trade-offs between time and money. Moreover, the 'wider impact' benefits that are conventionally added to the time savings are based on econometric estimation of agglomeration and related effects – further notional benefits, not directly observable.

Changes in land use and enhancement of land values are not included as benefits in conventional appraisal because this is seen as double counting benefits already included as time savings. However, this is a theory-based approach. An evidence-based approach would count what is real and observable, which would avoid double counting because people can do only one thing at a time – if they are taking the benefit of faster travel to gain more access, opportunities and choices, they cannot be saving time to carry out other activities, and vice-versa.

Investment appraisal of proposed transport investments should accordingly be based on evidence of expected benefits, as assessed from evaluations of outcomes of similar completed schemes. In general, changed land use and real estate development will constitute an important part of the benefits, which it would be misleading to disregard.

Road and rail investment

The case of investment to catalyse the development of Docklands is characteristic of new rail routes. Recall the USA in 1840, populated largely along the coasts and inland waterways, the economy about the size of that of Italy's. There followed a boom in railway construction that opened up the interior to agriculture, mining and industry such that by 1890 this was the largest economy on the world.

Rail investment can effect a step change in access. For roads, the effect is generally incremental. Consider England's Strategic Road Network (SRN) where much investment is planned to cope with forecast growth of traffic. Congestion largely occurs near to populated areas where local users take advantage of the network for daily travel, whereas remote from such areas the traffic generally flows freely. Thus about half the traffic on the M25 comprises long distance users, for instance between the south coast ports and the Midlands and the North, avoiding London, the purpose for which this orbital route was built. The other half is local traffic, in particular journeys to and from work giving rise to the familiar morning and evening peak congestion.

The conventional approach to investment appraisal sees a congested motorway as an opportunity for investment to increase capacity. Time savings per vehicle multiplied by the large number of vehicles, then multiplied by standard values of time savings, generate monetary values of economic benefits that are compared with the construction costs to allow judgment about value for money. However, the time savings per vehicle are quite small.

Evaluation by the Highways Agency of a large number of what it terms 'major schemes' indicates average time savings of 3 minutes at peak, less away from the

peak usage. There is debate about the significance of such small times savings. On the one hand, it is argued that these are too small to change behaviour and so should be disregarded. On the other, it is contended that small time savings add up and so in logic must be counted.

While 3 minutes saving on a long distance trip is immaterial in behavioural terms, such time saving is likely to be significant for a local user. The faster travel made possible by an extra lane or improved junction, for instance, allows more opportunities and choices, particularly when people come to change jobs or move house. More generally, in those parts of the country where demand for housing exceeds supply, it must be expected that local users will take advantage of additional capacity on the SRN to seek more distant housing opportunities that they can afford. A similar effect is seen with urban rail improvements such as London's Overground. Some of the largest percentage increases in house prices in London in recent years have been found near stations on this route south of Docklands, in locations like New Cross, of limited inherent attraction but with relatively low priced housing.

When analysing the case for road investment, it is important to consider the different kinds of user and how each may benefit (as is done for rail investment, where commuters are distinguished from long distance travellers). Available evidence is consistent with the proposition that the main benefits of investment in the SRN accrue to local users who are enabled to travel further on their daily trips. The extra traffic thereby generated is known as 'induced traffic', which is the consequence of road construction and arises because in the long run people take the benefit of faster travel by travelling further, not by saving time. This extra traffic restores congestion to what it was before the investment and is the basis for the maxim 'You can't build your way out of congestion', which we know from experience to be generally true.

The increased access made available to local users leads to changes in land use - property development where planning consent is granted, increased prices of existing property where not. Such development is largely unintended. There is, however, a case for intentional road construction to foster development, but this has to be led by the developers and planners. If they agree that a site is suitable and commercially attractive for development, whether residential or commercial, and if investment in road access is needed to permit the development, that could be an appropriate claim on a roads budget, whether local or national, subject to a value for money test.

An example is the plan for a new 'garden city' on a former military site near Bicester, where 13,000 new homes are to be built and where the DfT has allocated £44m for road construction, including a link to the M40. This illustrates both that new housing on greenfield sites will require road investment on account of car ownership by residents, and that decisions about the location of such investment must be based on the intentions of the planners and developers, bottom up, not as part of a top down national strategy.

Tackling congestion

The rationale for much roads investment is to relieve congestion. One stated aim of the Government's Road Investment Strategy is a 'free-flow core network, with mile a minute speeds increasingly typical'. But if we can't build our way out of congestion through investment in civil engineering technologies, how is this aim to be achieved?

One possibility would be to toll new road capacity, partly to finance the construction and partly to deter local users who impede long distance traffic. The M6 Toll road operates successfully in this way.

A second approach addresses the reason why congestion is a problem. Surveys of road users indicate that an important factor is lack of reliability - the uncertainty of journey time. This can be tackled by providing users with good predictive trip time information. An example is the motorway roadside variable message sign predicting the time to the next junction – albeit short range and hence of limited utility. A more ambitious service is provided for freeway users in the Seattle area of the US who can input to the Department of Transportation website the locations of their home and work, the time they wish to arrive at work, and are advised the time to leave home to be at work on time 19 times out of 20. A further example is Google Now, which includes predictive travel times on the road system.

As well as providing useful information to individuals that lessen unreliability associated with congestion, there are benefits to the network as a whole. There are two kinds of road user: those who need to be at their destination at a particular time (for instance, going to work, to a meeting, making time-critical deliveries), who can use predictive journey time information to decide when to set out; and those who are more flexible in trip timing (going shopping, making am/pm deliveries), who can use such information to avoid peak traffic. This is win-win since the more the flexible users can avoid peak times, the less the congestion experienced by those who cannot avoid them.

The scope for mitigating the uncertainty associated with congestion is indicated by the ability of efficient road freight hauliers to offer clients just-in-time delivery. A haulier may contract with a supermarket chain to deliver from the central warehouse to the stores within 30-minute time slots, which the haulier can achieve because of the good understanding of the network and the ability to manage the location and performance each vehicle in the fleet using real-time and predictive traffic data from commercial sources.

Transport and economic performance

This road freight example is one instance of the way in which investment, in digital technology in this case, can contribute to improving business performance. It should be seen in the broader context of retail distribution taking advantage of faster travel on the road network to optimise efficiency by

consolidating many regional depots into a few large central facilities, thereby saving estate and inventory costs while improving distribution to high street outlets, so enhancing competitiveness.

It is, however, difficult to generalise about how transport investment may be expected to improve economic performance where the road and rail networks are mature, so that investment is at the margin, rather than transformative. The What Works Centre for Local Economic Growth at the London School of Economics has reviewed 29 impact evaluations that met minimum standards of evidence (WWC, 2015). Key findings, mostly based on a small number of studies, include:

- Road projects can positively impact local employment. But effects are not always positive and a majority of evaluations show no (or mixed) effects on employment
- Road projects may increase firm entry (either through new firms starting up, or existing firms relocating). However, this does not necessarily increase the overall number of businesses (since new arrivals may displace existing firms).
- Both road and rail projects tend to have a positive effect on property prices, although effects depend on distance to the project (and the effects can also vary over time)

The general lessons from this review of transport investments are:

- The economic benefits of transport infrastructure spending – particularly as a mechanism for generating local economic growth – are not as clear-cut as they might seem on face value.
- Arguments for spending more in areas that are less economically successful hinge on the hope that new transport is a cost-effective way to stimulate new economic activity. We do not yet have clear and definitive evidence to support that claim.
- Our findings raise fundamental questions about scheme appraisal and prioritisation, and about the role of impact evaluation in improving decision-making around transport investment.

Transport investment in London

The population of London is growing quite rapidly, but the city long ago decided not to accommodate additional car use, so the share of journeys by car has fallen from a peak of 50% of all trips in 1990 to 37% currently, with further decline to about 27% expected by 2050 on the basis of forecast population growth (central case) and continuing policies to invest in rail but not increase road capacity. Figure 2 shows an estimate of the share of journeys by car in London over the century 1950-2050. This exemplifies the concept 'Peak Car in the Big City'.

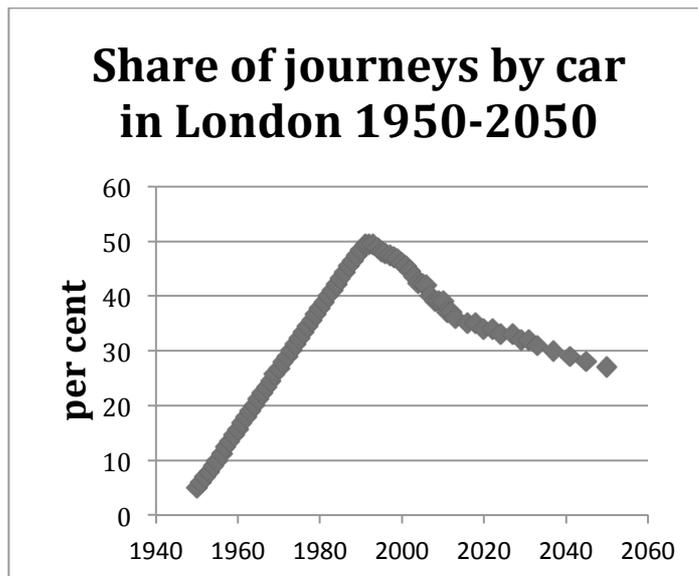


Figure 2 Source Metz (2015)

London is thriving - economically, culturally and socially – both despite and because of the decline in car use. Two key policies are largely responsible: a road capacity constraint plus parking controls in the inner boroughs and congestion charging in the centre; and major investment in rail that provides speedy and reliable travel for work trips, compared with the car on congested roads. As we see at Canary Wharf, well paid professionals can be attracted out of their cars onto trains through the stick of limited parking and the carrot of frequent fast rail services. In contrast, cities that rely on buses for public transport find it much more difficult to get commuters out of their cars.

The Mayor of London is responsible for both the transport system and for spatial planning, a helpful combination which contributes to the success of the city. The London Infrastructure Plan 2050 outlined options for investment in transport and other infrastructure to respond to population growth from 8.6m currently to 11.3m central estimate by mid-century and the corresponding growth in employment. This spatial plan provides a suitable strategic context for specific schemes such as Crossrail 2.

The economic case for each individual scheme will need to be made. This case needs to be grounded on evidence-based expectations of the benefits, in particular development of real estate (land and property) that will accommodate jobs and homes. Benefits from travel time savings should be counted only when these can be observed. Notional benefits from ‘wider impacts’ would be subsumed within market values of property and rents.

Given that the long term benefits from transport investment are found as real estate development, Transport for London should work closely with developers and planners to secure the benefits from its investment. In favourable cases, the enhancement of land values may be sufficient allow the developers to contribute to the cost of the transport investment.

Transport investment in Northern cities

The example of London argues for a spatial plan to provide the context and rationale for transport investment in the Northern cities to accommodate population and economic growth. One possible outcome, perhaps tacitly, would recognise Manchester as the main centre of the region, with an emphasis on the development of that city as a centre for business services. Another, perhaps politically more feasible, would be a multi-centric region of medium sized cities, somewhat analogous to the Thames Valley, with a mix of manufacturing and services. One key question is how to take advantage of the research potential of the universities, both for the cities in which they are located, and across the region. Related to this is the question of where to locate business in relation to the availability of skilled staff (it is noteworthy that Amazon has recently moved its UK HQ from Slough to central London).

At present there is no mechanism for spatial planning across the Northern cities as a group, and hence no consideration of options for location of population and economic growth across the region. Absent a spatial plan, decisions on transport investments will be an important influence on spatial development in ways that need to be addressed as part of the investment case.

It is not straightforward to develop a persuasive case for specific investments in the context of the Northern cities. Estimates of benefits based on travel time savings give no indication of the spatial location or likely scale of development. Estimates of 'wider impacts' depend on either rules of thumb or ambitious modelling which cannot be validated. It is therefore hard to say how transport investments will benefit the economies of these cities, based on conventional appraisal methods.

It is easier to predict changes in land use arising from transport investments that change travel to work patterns. Faster travel may be expected to result in people seeking housing and employment opportunities further afield. This would both improve the efficiency of labour markets and create opportunities for housing developments. For rail investments in particular, the location of new housing should be planned as part of the investment case.

Urban rail investments can allow cities to grow to higher density while meeting the mobility needs of the population. Regional rail plays a similar role. The tram-train being piloted at Sheffield-Rotherham is a relevant innovation. Bus rapid transit likewise provides speedy, reliable travel but at a cost lower than light rail (trams). Higher urban population densities generate agglomeration benefits, not only economic but also cultural and social, which enhance the attractiveness of cities, provided other aspects of urban liveability receive adequate attention. Accordingly, both urban and regional rail investments justify positive consideration.

What is unclear, however, is the extent to which better regional rail links that improve connectivity *between* cities would generate economic benefits over and above those associated with housing and labour markets for individual cities.

Road investments are even more problematic. For instance, the scheme to enlarge the M62 to four lanes along its entire length is intended to support the Northern economy but would induce local commuter use that would limit the benefits to long distance users. A new road link, largely in a tunnel, between Manchester and Sheffield might be of less benefit to commuters but would be expensive and hard to justify for improved connections between two cities that are otherwise well connected. More generally, road investments intended to improve connectivity within the region, whether north-south or east-west, are likely to be nullified by the stimulation of local use. Altogether, the ambitious plans for road construction set out in the Northern Transport Strategy seem of very uncertain benefit, albeit more consistent with a multi-centric region in which manufacturing remains important.

On the other hand, the plans for integrated information and ticketing across all public transport modes, part of this Strategy, are clearly sensible and, as digital applications, may be expected to be far more cost-effective than investment in civil engineering technologies. More generally, opportunities should be sought for other digital technology investments to improve the operations of the transport system and to enhance the experience of users. Predictive journey time information on the road network is one important possibility.

Modelling and forecasting

The standard approach to justifying transport investment of any scale involves modelling that compares a 'do something' case (ie with the investment) with a 'do minimum' case (without the investment). Most models estimate travel behaviour changes in the absence of land use change, generating travel time savings resulting from the investment that are used as inputs to the economic appraisal. However, for reasons previously discussed, assuming no changed land use is not consistent with evidence from completed schemes. Models that integrate transport and land use are available, although not generally employed.

Modelling involves much uncertainty, many simplifying assumptions and limited data for calibration. Transport models cannot be independently validated. Given the considerable judgement involved in generating plausible outputs, it is not surprising that modelling is generally found to support the inclinations of the authorities that commission the studies. When such authorities are bidding for central government funds, other people's money, modelling will generally be found to support the bid.

A further difficulty with transport models is the routine assumption that the future will be like the past, with change driven only by exogenous parameters such as GDP growth, population growth, oil prices etc. But if the future is different from the past, as is indicated by the peak of car use in London (shown in Figure 2) and similar indications for Birmingham and Manchester (Metz, 2013), then forward looking relationships (elasticities) need to replace historic calibration data. This is difficult to achieve in practice. For example, the DfT's

National Transport Model has not yet recognised the emergence of peak car use in London and so forecasts substantial increases in car traffic in this city.

Conclusions

The transport system moves people and goods through space. New investment adds to this movement, the benefits being reflected substantially in changed spatial distribution, not reductions in travel time. The difficulties that the Commission is likely to experience in making recommendations for transport investment derive in part from shortcomings in existing methodologies, in particular that conventional economic appraisal is based on estimates of notional times savings and disregards the evidence for changed land use and real estate development as important benefits of investment. Moreover, conventional travel demand modelling and forecasting does not recognise important recent changes in behaviour, as reflected in the peak car phenomenon.

For its medium term work, the Commission might wish to review these methodological issues. More generally, there may be a role for the Commission to act in ways analogous to the Office for Budget Responsibility and the Committee on Climate Change, offering advice to national and local government on the merits of infrastructure investment based on independent analysis, both of methodologies and of substance.

In London, expected economic and population growth is the main determinant of future transport investment, which is therefore relatively unproblematic in principle. For the Northern cities, such growth is less obviously a given, and a desired role for transport investment is to foster growth. However, the prospects for speculative transport investments are uncertain. Hence to secure the benefits of transport investments, decisions should not be taken in isolation but as part of planned real estate developments involving both developers and planning authorities. Decisions on urban and regional rail investments seem more straightforward than for road investments, for which there is a good case for preferring cost-effective digital to costly civil engineering technologies.

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4 January 2016

[contact redacted]

RE: NATIONAL INFRASTRUCTURE COMMISSION CALL FOR EVIDENCE

I am writing on behalf of the Ebbsfleet Development Corporation (EDC) in response to the call for evidence on National Infrastructure needs.

Ebbsfleet Development Corporation

The EDC has been established by Central Government to deliver Ebbsfleet Garden City: a development of up to 15,000 new homes in North Kent, with new employment opportunities and supported by transport, utility and community infrastructure. Blue and Green infrastructure will also be an important and defining characteristic. The recent announcement of Enterprise Zone status and securing £310 million of funding to support infrastructure will result in a high level of activity in developing the garden city and since is now over 1.2 million square metres of commercial, retail and leisure uses consented across the Garden City resulting in both residential and commercial growth.

Ebbsfleet Garden City is to be delivered at pace aspiring to provide a high quality built environment. It is anticipated that the impact of the Garden City will be felt beyond the EDC's boundary, with a positive ripple effect locally (particularly in Dartford and Gravesham boroughs), both in the residential and commercial markets. Whilst it is not possible to quantify this as this time, anecdotally a positive uptake in the housing development and developer interest is being reported locally following the Garden City announcement.

Existing Strategic Context and Connectivity

From a transport perspective, Ebbsfleet Garden City is very well located; existing rail connections provide both high speed (HS1) and conventional rail services into London from three local stations: Ebbsfleet International, Northfleet and Swanscombe. Central London is therefore within 17 minutes of Ebbsfleet Garden City, with excellent connectivity into the wider Kent region too. The presence of direct Eurostar services additionally means quick and easy access to continental Europe.

Rail infrastructure is therefore one of the key attributes and requirements of Ebbsfleet Garden City as future destination for living, working and leisure. In response to the questions asked by the NIC the following key infrastructure improvements are hugely relevant:

Upgrading the A2

Upgrading the A2 is identified as one of the top 40 infrastructure items in the NIC under the strategic road network capacity heading. The delivery of the Garden City is heavily dependent on there being sufficient capacity in the local and trunk road network. Whilst the primary infrastructure of HS1 will take some of the strain for the commuting population, the homes under development at Castle Hill, the National Grid site, at Northfleet and at Ebbsfleet and the rest of Eastern Quarry, along with the advent of the London Paramount resort in 2021, will mean that an improved A2 needs to be functioning at optimum levels. The two crucial junctions are Bean junction and Ebbsfleet junction which unusually for a dual carriageway are within 1 mile of one another on the A2 to the south of the Garden City and the sites referred to above.

Ebbsfleet International Station

Following initial studies by HS1, there will be a need to upgrade the station building at Ebbsfleet International should the major international resort London Paramount come to fruition, to ensure that it has sufficient capacity to cope with future customer projections. This will include changes to facilitate pedestrian flow, way finding and both core and non-core facilities to ensure an excellent service and environment for all types of customers, noting particular that the London Paramount resort proposals will mean a more two way flow, as opposed to the current, near tidal operation.

Rolling Stock

Following initial studies, it is apparent that new rolling stock and train services will be required to cope with the large increase in future customer demand, particularly at peak commute times and during new weekend peaks created by the London Paramount Resort. The quality of service delivered along the track and at stations, both during and after construction, must be protected to prevent disruption to train operations and the travelling public.

Lead in times for procurement of rolling stock are lengthy and need to be planned accordingly to avoid the negative public perception of the railway and corresponding detrimental impact on the new developments and the Garden City.

Crossrail

A safeguarded Crossrail route already extends beyond Ebbsfleet from Abbey Wood to Hoo Junction. When seeking to deliver a garden city in the 21st Century this route is seen as an obvious opportunity that the EDC should pursue. The EDC feel that extending Crossrail from its current terminus at Abbey Wood to the stations at Swanscombe or Northfleet or Gravesend along the existing protected route would be extremely beneficial to growth in the vicinity. An extension into Ebbsfleet International Station would connect much of the rest of Kent into this service, particularly to Heathrow.

This infrastructure is imperative to attract development and investment in the Ebbsfleet area and as such the EDC has joined with Bexley Council, Kent and TfL in preparing a joint submission sent under separate cover. Provision of this Crossrail extension provides a further direct route from London, improving the Ebbsfleet location for commuters and hereby increasing housebuilder confidence in the location. It further increases commercial and employment potential in the area and continues to assist in opening up North Kent/ East London as future centres for development. North Kent’s development plans and population growth form an attractive proposition for new companies from the UK and overseas to relocate or expand here. For this to happen road and rail infrastructure must be improved and capacity increased.

Yours sincerely,
Louise Wyman
Director of Strategy

www.ebbsfleetdc.org.uk



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England's Economic Heartland
Programme Office
c/o Buckinghamshire County Council
County Hall
Walton Street
Aylesbury
HP20 1UA

8th January 2016

Dear Sir,

National Infrastructure Commission: call for evidence
Response of England's Economic Heartland Strategic Alliance

The Strategic Alliance is a non-statutory partnership whose participants share a collective ambition to realise the potential of England's Economic Heartland. Its participants are committed to looking beyond current success and, through collaborative working to a common purpose, raise levels of productivity to match, and where possible exceed, those of global competitors by addressing the identified barriers to economic growth.

As an Alliance of strategic authorities and their constituent LEPs, the partnership represents almost 3.5 million people from:

- Oxfordshire
- Buckinghamshire
- Northamptonshire
- Milton Keynes
- Luton
- Central Bedfordshire
- Bedford
- Cambridgeshire

It is an expressed aim of the Alliance to seek to become a statutory Sub-National Transport Body. The Alliance partners are also committed to developing a strategic infrastructure plan whose scope reflects that of the Commission: a recognition by the partners of the critical importance that strategic infrastructure has to play in supporting planned growth.

Given these ambitions, the proximity of the Heartland to London, the Midlands and North and our shared issues with connectivity, London transport infrastructure and energy supply, the Alliance looks forward to working closely with the Commission as it looks to advise Government on future infrastructure investment priorities.

Connecting Northern Cities

1. ***To what extent are weaknesses in transport connectivity holding back northern city regions (specifically in terms of jobs, enterprise creation and growth, and housing)?***

2. ***What cost-effective infrastructure investments in city-to-city connectivity could address these weaknesses? We are interested in all modes of transport.***
3. ***Which city-to-city corridor(s) should be the priority for early phases of investment?***
4. ***What are the key international connectivity needs likely to be in the next 20-30 years in the north of England (with a focus on ports and airports)? What is the most effective way to meet these needs, and what constraints on delivery are anticipated?***
5. ***What form of governance would most effectively deliver transformative infrastructure in the north, how should this be funded and by whom, including appropriate local contributions?***

The Alliance makes no response to these questions but raises the matter that the success of economic initiatives in the North are in no small part dependent upon the infrastructure connections through and across the Alliance area, particularly through improved radial and orbital movements from London and the South Coast by road and rail.

London's transport infrastructure

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

London and its commuter hinterland face significant economic and social challenges in the short, medium and longer term. Unless drastic changes are made over the next two to three decades, congestion will have a severe impact on the economy and people's daily lives, with many journeys being effectively impossible. Forecasts show that additional transport capacity is required across the wider South East but this should not necessarily be through continued emphasis on focusing exclusively on radial connectivity. New or improved strategic road and rail infrastructure across the wider South East will change travel patterns thereby supporting economic development in the wider South East and at the same time provide some relief to the demand on traditional radial corridors serving London. In addition to giving rise to wider beneficial impacts for London and England's Economic Heartland, such an approach would be consistent with the Government's ambition to rebalance the economy.

It is clear from our engagement in the emerging London Plan, that the economy will continue to be over-heated in the city and there will be difficulties in meeting the housing demand that comes with this. It has also been accepted that the South-East supports London growth by delivering homes to meet the current and planned growth through our own housing allocations. A sub-national approach to strategic planning will be needed to avoid offsetting this economic growth by extending radial links outward to bring labour to jobs; rather there needs to be a shared aim to re-balance the economy across the South East (and indeed to the north as well) and seek to reduce the need for journeys through/to London by providing much needed infrastructure to support economic growth in the wider South East. This will allow London to meet more of its own need whilst supporting a more balanced economic approach.

Some of the fastest-growing towns and cities in England are located in a belt to the north of London which already enjoy some strong, albeit well-used, links which support London. England's Economic

Heartland – with an economy worth £90bn but with the potential to grow another 20 per cent - clearly has the potential to help offset some of the over-heated economic impacts on London so that existing radial networks can more efficiently serve in and out-commuting to meet demand. The economic potential of the Heartland area reflects its competitiveness in global markets, driven by its leadership in the digital economy. Our approach to investment in transport infrastructure must avoid reinforcing traditional patterns of movement when economic growth derives from the new economy.

England's Economic Heartland sits on the busy road and rail transport corridor between the south coast ports, the Midlands and the north and enjoys easy links to London and the West Midlands via the M40. However, it suffers a lack of east-west connectivity, in particular to the high-value growth areas around Milton Keynes and Cambridge, and also in terms of access to/from the international gateway at Luton Airport (including business aviation needs arising from businesses in the Heartland area operating in the global market).

There are currently no direct rail connections between the centres of Oxford and Cambridge and to the areas in between (forcing commuters to travel into London in order to come out again), while travel by road involves cross-country single-carriageway routes or use of the M25 around London. Improving the connectivity on this corridor – through East-West Rail and the Oxford to Cambridge Expressway projects - will place the authorities in the Alliance at the centre of the south-east orbital corridor as a key hub for south-west to north-east transport. As a result, England's Economic Heartland would realise further improvement in agglomeration opportunities for jobs, growth and innovation, with its vastly-improved road and rail links to these high-value centres of the UK economy.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

The focus for investment to help London should not solely be within London. Existing radial routes, much the focus of current and previous national investment, serve to provide vital lifelines for labour supply to meet London's booming economy. While the Heartland area has good radial connections into and out of London, the service level on transport connections across much of the area - for example, including between major economic hubs such as Oxford, Cambridge, Aylesbury, Milton Keynes and Luton – is notably poor, a consequence of existing high levels of economic activity and travel demand already looking to avoid the need to transit the London area.

The lack of transport for people and freight between these areas creates an artificial barrier between hubs of knowledge-based growth. This area was recently recognised as being the most innovative part of the UK - connectivity between this area, and particularly north London, will not only reinforce London's and the UK's attractiveness in terms of investment, but as the area also links very well to the North West and North East, it provides a good platform for linked innovation growth in the Midlands and Northern Powerhouses.

Pushing forward with plans to complete East-West Rail and the Oxford to Cambridge Expressway (including vital links to the A34 linkage to the South Coast ports) provides a critical and long overdue outer-orbital that complements growth in London by reducing the need for traffic to transit through

it, supports the Alliance partners to realise the potential of England's Economic Heartland, as well as enabling the logistical needs of the national economy to be supported.

- ***How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?***

East-West Rail will reconnect Oxford to Milton Keynes and Cambridge by rail, and direct rail access from the west into Heathrow. This is due for completion in Control Period 6, post 2019 and must not slip any further in delivery.

In addition, work on the Oxford to Cambridge expressway is underway and we are working with Highways England to develop a route based strategy linking Southampton and the East Midlands, which will include improvements to the A34 and the development of an expressway to connect the two growth centres, linking up major economic hubs along the way (i.e. Milton Keynes, Aylesbury, Luton). England's Economic Heartland will put forward an initial statement of investment priorities in autumn 2016 as part of the input into the review of the Road Investment Strategy (due to be reviewed in 2017) and the related review of the rail infrastructure review.

- ***What might their potential impact be on employment, productivity and housing supply in London and the southeast?***

Work to date has demonstrated that improvements in economic productivity across the Heartland area would generate an additional 20% GVA per annum – equivalent to c£10bn per annum. Just as important, a failure to invest in the Heartland will result in the level of service on existing infrastructure declining making existing business activity increasingly uncompetitive in global markets. A decline in economic performance would reduce the Heartland's net contribution to the Exchequer, thereby reducing the scope for investment by Government across the UK.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

No comment.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

- ***What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?***

If there was to be evidence of a proper regional distribution of investment and growth in support of London, then regional contributions to the solutions would be defensible and fair. The uplift in growth realized through delivery of both East-West Rail and Oxford to Cambridge Expressway will be significant and would need to be reflected in some way. The Alliance members already have a well-established partnership in support of East-West Rail contributing over £45m to its delivery. Furthermore, the likelihood of such an arrangement would be improved should the Alliance be

successful in its attempts to become a Sub-national Transport Body as provided for in emerging legislation.

- ***What innovative funding mechanisms could be considered to support delivery of key schemes?***

Notwithstanding the potential to deploy innovative financing mechanisms to deliver key schemes, the cost of those schemes will ultimately have to be met from one of three funding sources – the user or beneficiary of the infrastructure, local sources of funding (council tax payers or local businesses), or central Government investment.

5. *How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?*

No comment.

Electricity Interconnection and Storage

The responses in this section are based on our experience of the grid or distribution network in Oxfordshire, however they are reflective of the challenges faced across the Heartland area. The Alliance partners commitment to develop a strategic infrastructure plan reflect a recognition on their part that the issues need to be addressed at a sub-national scale

The questions below assume that the installation of renewable energy generation is proceeding unhindered so as to provoke the need for balancing of supply and demand, including deploying energy storage. Unfortunately, this is not the case.

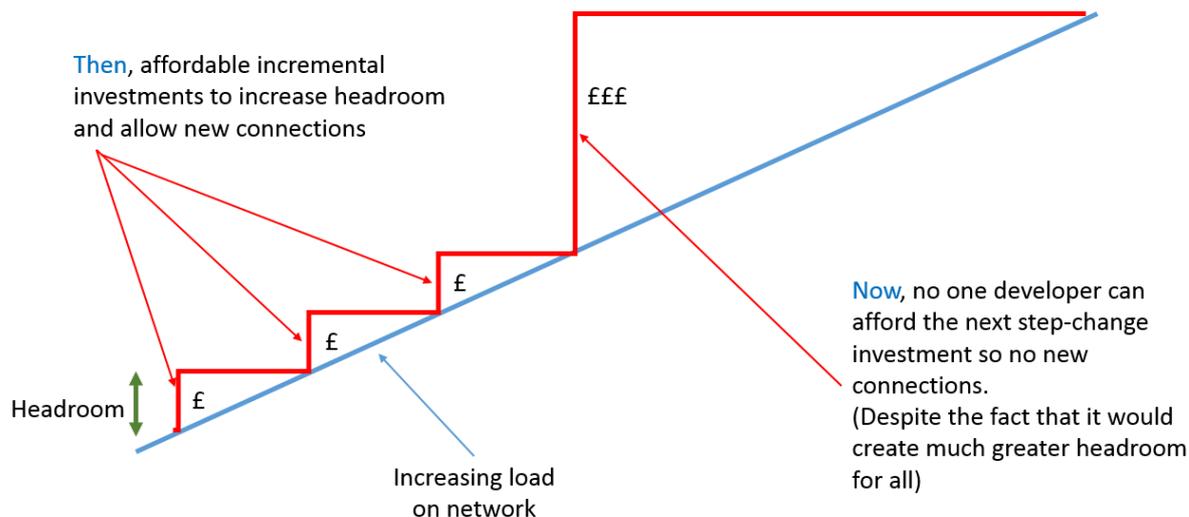
It is worth pointing out that there are two fundamental issues:

- There is an acute need to invest in renewable energy to diversify and add to current supply to meet demand; and,
- There is a need for additional capacity full stop to support large scale economic/housing growth.

The local market for connecting new renewable energy schemes to the distribution network has effectively failed. All of the sub-stations operated by Scottish and Southern Energy Power Distribution (SSEPD) across Oxfordshire for example, are constrained by fault levels. So, in practical terms, there will be no new large installations (above 50kW) in Oxford for the foreseeable future. In Bicester, there will be no new renewables, nor allocation of new supply connections until 2019 at the earliest. There are similar examples from elsewhere in the county: In November, a £240k solar PV scheme in Chipping Norton, Oxfordshire, was recently quoted a connection cost of £437k with a delay of two years, making the scheme unviable.

As elsewhere across the Heartland area, Oxfordshire's local grid needs significant investment to make it fit for the 21st century. It needs to move from a centralised energy system designed to distribute electricity in one direction to the smart system needed to manage embedded generation and storage, as well as the increasing up-take of electric vehicles. At present, this is funded by individual developers as they request a connection. We have reached the point where no one individual developer can afford the cost as shown in Figure 1 – The Investment Hurdle

Figure 1 – The investment hurdle



We also believe there is a significant information failure in this market: scheme developers are unaware of each other, making it difficult to pool resources. The Distribution Network Operator (DNO) reacts only to firm requests to connect rather than taking a strategic view based on the much wider range of information available. The Alliance suggest that the regulatory framework within which the 5-year investment plans are prepared by the operators (and approved by the Regulator) must be required to take into account the strategic growth identified by local partners. We feel the most efficient and effective way of doing this would be at a sub-national level reflecting the reality that networks extend beyond individual local authority boundaries.

The current approach is inefficient thereby increasing costs to developers – in re-scaffolding when limits on schemes size are relaxed or in abortive costs when schemes turn out to be financially unviable because of the high cost of connection.

To develop as it should, the energy grid needs mechanisms to facilitate funding in advance of a connection request, based on a strategic vision of the development of the grid. There may also be a 'public good' argument for investment in the grid, analogous to investment in other infrastructure such as roads and broadband.

The strategic vision needs to be owned by local stakeholders as much as the DNO. This requires much greater dialogue between planners, the DNOs and major users to avoid pinch-points blocking development, as is happening in Bicester with knock-on impacts on Oxfordshire's economic growth.

The Alliance suggests that an obligation should be placed on the DNO to work with sub-national bodies to identify the longer term strategic needs for additional installed capacity – and then a requirement on the regulator to take that into account when agreeing to specific 5-year investment plans. The Alliance partners are keen to work with the Commission to develop its thinking in this area with a view to shaping the remit of the Commission moving forward (and ensuring future legislation is fit for purpose).

We would also like to see greater use of the Ofgem innovation funds to help support the area's long term innovation and growth strategies. Exploring smart solutions to fault-level constraints is key as is

supporting the innovative work we are doing in the electric car market which impacts on the grid and could provide a balancing function. In this example, the electric car is part of the storage chain and adds a wider value to the energy use/storage cycle without the need for wider storage investment. This presents a huge opportunity, so reinforcing the point that forward planning must improve.

1. *What changes may need to be made to the electricity market to ensure that supply and demand are balanced, whilst minimising cost to consumers, over the long-term?*

Investors need a secure and equitable investment environment with clear long-term signals within which to plan multi-year projects that have investment and construction timescales that extend well beyond the timeframes associated with regulatory reviews. The recent reviews on rail infrastructure investment have noted the difference in terms of cost and efficiency of large scale investment schemes handled outside the 5-year regulatory framework (i.e. Crossrail and Thameslink) with those handled as part of the regulatory framework (i.e. GWML electrification) – if Government is sympathetic to shifting more strategic schemes outside of regulatory frameworks then one could see a similar approach being applied to other sectors. The Alliance wants to work with the Commission to explore this opportunity further. Without this environment, new energy supply projects will not come forward at the rate needed

At the local grid level, for example, Oxfordshire's thriving community sector is already demonstrating balancing projects which have significant potential:

- Project **ERIC** (Energy Resources for Integrated Communities) is an initiative bringing solar PV power and smart energy storage to up to 100 homes in Rose Hill, East Oxford. Project ERIC is led by Moixa Technology and Bioregional and is part-funded by Innovate UK. Using domestic Maslow batteries and a new software platform, Project ERIC aims to demonstrate how distributed storage in a community can be managed to reduce average peak grid load by 65% and increase self-consumption of local PV energy across the community by twofold¹.
- The award winning **Energy Local** project aims to use smart technology systems to pool community demand so that members can access the time of day tariff and locally generated renewable power directly, adjusting demand to reflect local generation².

The market needs to facilitate local initiatives such as these by minimising the cost and resources needed to participate. Whilst they will initially contribute to local balancing, they can of course contribute to the national balancing market at scale, which is the long term intention.

What role can changes to the market framework play to incentivise this outcome:

- ***Is there a need for an independent system operator (SO)? How could the incentives faced by the SO be set to minimise long-run balancing costs?***

There is a major need to upgrade the local grid in Oxfordshire so that it facilitates new approaches to the generation, storage and use of electricity rather than blocking them as at present. Such an upgrade will also require a change in the role of the District Network operator (DNO) to an

¹ <https://localisedenergyeric.wordpress.com/>

² <http://www.energylocal.co.uk/>

independent system operator, if not a new operator. The incentive scheme should encourage the strategic rather than reactive management of the network in partnership with local stakeholders. It could also remove the barriers in the current system which mitigate against long term strategic investment.

- ***Is there a need to further reform the “balancing market” and which market participants are responsible for imbalances?***

As above

- ***To what extent can demand-side management measures and embedded generation be used to increase the flexibility of the electricity system?***

Oxfordshire has shown that community energy initiatives, such as ERIC and Energy Local, can make a significant contribution to both demand-side management and embedded generation. In particular, the Low Carbon Hub has demonstrated that there is a strong demand for local investment opportunities. It must be recognized though that this is only part of the supply offer to meet what will be significant growth in the Alliance area.

At present, this is held back by fault level constraints and by the failure to develop a smart grid in the county.

2. What are the barriers to the deployment of energy storage capacity?

- ***Are there specific market failures/barriers that prevent investment in energy storage that are not faced by other ‘balancing’ technologies? How might these be overcome?***

Battery-based storage is still expensive. Further government investment in battery innovation, testing and de-regulation are required for example to meet the challenge of creating a step change and shift away from carbon-based engines. The Alliance area is at the forefront of this and needs continued investment to succeed.

Some energy storage devices, such as batteries, can contribute to fault levels. At present, fault level constraints in Oxfordshire and the consequent market failure limit the roll-out of such devices at scale. This basic issue needs addressing as described above.

- ***What is the most appropriate scale for future energy storage technologies in the UK? (i.e. transmission network scale, the distributed network or the domestic scale.)***

All scales are appropriate to make the best fit with the technology and source of funding eg pumped storage will work at the transmission network scale. In contrast, businesses, schools and households will invest in small-scale battery storage which in aggregate will make a significant contribution.

3. What level of electricity interconnection is likely to be in the best interests of consumers?

- ***Is there a case for building interconnection out to a greater capacity or more rapidly than the current ‘cap and floor’ regime would allow beyond 2020? If so, why do you think the current arrangements are not sufficient to incentivise this investment?***

- ***Are there specific market failures/barriers that prevent investment in electricity interconnection that are not faced by other 'balancing' technologies? How might these be overcome?***

We assume these questions relate to interconnection at the level of the transmission network and therefore have no comment.

4. What can the UK learn from international best practice in terms of dealing with changes in energy technology when planning to balance supply and demand?

How best to roll out and use a smart grid to make more efficient use of the grid asset.

The Alliance partners look forward to working closely with the Commission as it discharges its functions. If you need any further information in response to this submission please contact me on [\[email redacted\]](#)

Yours sincerely

Martin Tugwell
Programme Director

6th January 2016

National Infrastructure Commission
1 Horse Guards Road
London
SW1A 2HQ

Dear Sir/Madam,

Response to the National Infrastructure Commission Call for Evidence - future investment in the London's transport infrastructure

Enterprise M3 is responding to the National Infrastructure Commission Call for Evidence and in particular the request relation to future investment in the London's transport infrastructure.

Enterprise M3 is the Local Enterprise Partnership for an area which covers parts of the counties of Hampshire and Surrey, including north and central Hampshire, and western Surrey up to the M25. The LEP area includes major centres such as Aldershot, Winchester, Basingstoke, Woking and Guildford. In total, the LEP area encompasses over 1,600,000 residents and 86,500 businesses; accounting for nearly 20% of the South East's economic prosperity.

The LEPs remit is to support and sustain economic growth at a local level and Enterprise M3 has set out its vision, key priorities and actions in its Strategic Economic Plan, which was published in March 2014. The SEP sets out a clear vision of what the LEP and its partners plan to do over the period up to 2020/21 to create new jobs, increase the number of business start-ups and improve the productivity of local businesses. Improvements to transport infrastructure to enhance connectivity are a key part of this Plan, which identifies a series of infrastructure improvements that are part of the 'strategic ask' for transport investment, to improve connectivity within our area, to ensure that the LEP can thrive economically, maximise job creation and attract inward investment from businesses.

The work of the Enterprise M3 LEP is endorsed by government as part of its strategy for developing the UK economy and is driven by close collaborative working with local authorities, the business community and other stakeholders in the area. The Enterprise M3 Growth Deal encapsulates the priorities that have recently been agreed with government in response to the needs and priorities that we have identified with our local, public and private sector partners.

What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

Enterprise M3 is particularly concerned by the potentially dismissive reference in the question to the South East as London's "commuter hinterland." If the Commission is going to achieve its aims it is essential that it recognises that the importance of the economy of the areas around London in its own right and not merely as an area that serves the needs on London. Economic success in the wider South East benefits London and indeed the whole of the UK. It is worth highlighting that the South East pays considerably more in taxes than it receives in public spending – creating a net 'profit' for the Treasury. Indeed the South East was the biggest net contributor over the 10-year period 2002-12, generating a profit of £80bn for the Treasury; this compares to London's £74.8bn over the same period.

Notwithstanding this, key social and economic challenges the LEP would highlight are:

- Meeting the Government's productivity aspirations and encouraging a higher-skilled workforce for contribute to the local economy.
- Provision of new homes and business space in appropriate locations.
- Delivery of a very large expansion in the supply of housing.
- Enhancing economic interactions and labour mobility through connectivity improvements.
- Being able to deliver transport infrastructure and capacity so that it does not act as a constraint on economic growth as well as meeting the skills and housing challenges identified above.
- Achieving certainty over expansion associated with increased airport capacity in the South East and ensuring that associated infrastructure is provided.
- Improvements to cross country road and rail routes linking South East economic areas without the need to travel via Central London reducing associated congestion.
- Better road and rail access to nationally important ports and airports to boost their attractiveness as business locations and improve connectivity to international markets.
- Reducing congestion and removing bottlenecks on strategic road corridors.
- Improved journey times on the major rail lines into London for business travellers and commuters.
- Enhancements to the attractiveness of the area for new investment, including foreign direct investment.

Improving strategic transport routes in the South East will support economic growth both nationally and locally bringing a significant return on investment for public funds. By failing to invest there is a risk of adding to the congestion, frustration and costs that businesses across the UK face when using the South East strategic transport corridors including as gateway routes to London and the South East's international ports and airports. Investment is needed to maintain the attractiveness of the area for business and to secure the delivery of key development sites, new homes, new commercial floor space and new jobs. Without strategic investment in high quality transport infrastructure London and the South East runs the risk of losing businesses to international competitors.

It is no accident that the world's leading companies see London and its surrounding areas, including the Enterprise M3 area, as the place to locate and do business. The halo effect of London supports jobs in the wider South East and the whole UK. Enterprise M3 would also advocate stronger collaborations between London and the LEP areas that surround London.

What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

Enterprise M3, Coast to Capital, Solent and Thames Valley Berkshire Local Enterprise Partnerships, working closely with the local highway authorities, have jointly commissioned an economic impact study that addresses exactly this question for our area.

The work will identify, describe and quantify the economic case for improving connectivity in major strategic movement corridors across South East England.

The work is developing an economic methodology to identify and define the movement corridors. The development of the corridors will address known and forecast problems such as improved connectivity through faster and more reliable journey times. They will be prioritising the corridors, identifying potential solutions for delivering change and providing an outline business case for potential infrastructure investments. This study is due to report early later this month and the LEPs will be happy to share the results of this work with the Commission.

What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Enterprise M3 is also responding to the consultation on Crossrail 2, so attached is a copy of our response, which addresses this issue in relation to the benefits of the proposed Crossrail 2 scheme and the need for investment in other rail infrastructure on the South-West Mainline.

What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

Investment in infrastructure is fundamental to achieving economic growth. Key to success in funding its provision is de-risking investment and development and creating more certainty about funding for infrastructure provision. This will ensure that the infrastructure of the area is able to support, enhance and facilitate economic growth, boost productivity and improve the standard of living.

There are many different funding models available but Enterprise M3 believes that the type of approach used to fund schemes is not as important as having certainty that funding will be available over a sustained period of time. This will ensure that infrastructure schemes can be developed, with certainty that the funding is in place for their delivery. Such certainty engenders confidence and will allow scheme promoters to commit resources to scheme development and enable businesses to plan for the future, assured that the infrastructure needed for economic growth will be forthcoming.

This is of particular important to secure housing growth and in this instance it may be that Government needs to effectively underwrite public/private funding sources, to provide a level of certainty for the accelerated delivery of housing by the private sector that is being sought.

How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

No comment

Yours faithfully,

A handwritten signature in black ink that reads "Kevin Travers". The signature is written in a cursive style with a long, sweeping underline.

Kevin Travers
Project Manager Transport Enterprise M3 LEP

London's Transport Infrastructure

Essex County Council Submission to the National Infrastructure Commission Call for Evidence
11 May 2016

1. **Essex County Council (ECC) welcomes the opportunity to contribute to the national debate on transport infrastructure via the inquiry being undertaken by the National Infrastructure Commission. Improvements to transport infrastructure in and around Essex are vital to unlock growth in the London City Region and connecting London businesses and communities to these centres of economic opportunity, international gateways and key labour markets.**
2. **Given the key role that infrastructure in Essex (for example London Stansted airport, the M11, A12, West Anglia Mainline and Southend airport) play in enabling growth in the Capital, we would be delighted to provide further evidence to the Committee in person.**
3. Greater Essex connects businesses across London and the South East to world markets through airports at London Stansted and Southend and major port clusters in South Essex and Haven Gateway. It also provides a labour force of more than 149,000, contributing some over £10bn per year to the capital's economy. However, to sustain this connectivity our infrastructure needs investment.
4. The rail network in Essex that connects commuters to London and beyond is already operating at capacity, on the West Anglia Mainline [WAML] journeys between London and Stansted airport are longer than some of the flights to destinations the airport serves, reducing the attractiveness of this as a place to live, work and travel from and to.
5. Our ports are some of the largest in the Country connecting businesses to London but, without investment in the surrounding road and rail network we risk being left behind as logistic operators choose elsewhere with better, more reliable connectivity.
6. Stansted Airport is the only major airport in the Southeast that has the immediate capacity to grow within its existing permissions. It has capacity to take a further 13 mppa, from 22 mppa to 35 mppa within current planning permissions and has permissions to operate 264,000 Air Traffic Movements (ATMs) per year (243,500 passenger ATMS and 20,500 cargo ATMs) without the need for major further capital investment in the airport. However, improvements to surface access will be required.
7. Southend airport already has the immediate capacity to grow within its existing permissions. It can double from 1 million passengers per annum (mppa) to 2 mppa within current planning permissions and has permissions to operate 53,300 Air Traffic Movements (ATMs) per year without the need for major further capital investment.
8. However, whilst both airports have the capacity to grow within existing permissions and realise wider economic benefits for the London-City region, they are constrained by surface access.

9. Stansted airport is constrained by capacity on the strategic road network particularly the M11 J8, A120, M11 J8 – J9 and A14. It is further constrained by capacity, reliability and journey time of the West Anglia mainline “Stansted Express” service from London Liverpool Street. Southend airport is constrained by the capacity and reliability of the A127.
10. The Dartford Crossing is the only fixed road crossing of the Thames east of Greater London, however it is the busiest estuarial crossing in the United Kingdom, with an average daily use of over 150,000 vehicles.
11. Our response lays out our proposals on improvements to transport infrastructure in the London City-Region for consideration by the Commission and centres on opportunities in the following areas:
 - **West Anglia mainline four-tracking** - along the Lea Valley between at least Tottenham Hale and Broxbourne. However, Essex County Council supports the view of Harlow District Council that a feasibility study is required to explore the option of extending Crossrail 2 and 4-tracking to Harlow Town station. Overall Harlow has an increasingly important economy, with the success of their Enterprise Zone, and the relocation of Public Health England. At the same time the town has major ambitions around housing growth, which will support growth locally and within the London labour market. Harlow Town station also has existing and capacity for further stabling for trains. Four-tracking would provide rail capacity to bring forward the delivery of 6,000 – 12,000 new homes and 2,000 – 5,000 additional jobs to support growth along the Lea Valley and wider London Stansted Cambridge corridor and, to enable a London – Stansted journey time of 30mins.
 - **A120 corridor dualling** – we ask HM Government to consider our specific proposals on dualling the remaining sections of the A120 between Braintree – A12 and Hare Green to Harwich; the ports and logistics sector in this corridor has a turnover of £3bn per annum and employs over 32,000 people. With investment, the economy could grow by £1.3bn.
 - **Capacity improvements to M11 J8** – the junction is already at capacity and improvements would support growth at Stansted airport, unlock opportunities for local housing growth and improve connectivity between London, Stansted and Cambridge.
 - **Creation of M11 J7a** – to provide stronger links between London and Stansted airport and between the capital and the economic opportunities that exist within the Harlow Enterprise Zone.
 - **Upgrading of the M11 north of the airport between J8 – J9** – to provide stronger and more efficient links between Stansted airport, and the economic opportunities between London, Stansted and Cambridge.

- **A127 improvements** – the A127 has significant capacity and reliability issues, as highlighted in the Inner Thames Estuary [ITE] Study on Surface access, and flows which need to be addressed if it is to maintain current jobs and aid the delivery of new jobs and housing growth along the corridor. The A127 carries in excess of 70,000 vehicles per day which exceed those on many urban motorways elsewhere in the UK.

12. We are pleased that the importance of infrastructure is being considered by the Commission. Our evidence shows that there are already examples of ambitious projects based on robust understanding of local needs and that demonstrate joint working across a range of partners.

Cllr Rodney Bass
Cabinet Member for Infrastructure

Cllr Kevin Bentley
Cabinet Member for Economic Growth

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

- 1.1 Covering an area more than twice the size of Greater London, Essex has diverse strengths and is positioned to exploit an equally diverse range of opportunities. The county provides an excellent location for connecting businesses to centres of economic opportunity, including London, and internationally via the London Gateway and Harwich ports, and Stansted and Southend Airports.
- 1.2 Being so well located means that Essex is a significant contributor to growth; currently it supports 677,750 jobs; some 76,750 businesses. In 2013, Essex's businesses generated Gross Value Added (GVA) of £32.5 billion.
- 1.3 The commuting relationship between Essex and London is reciprocal; each year 149,000 Essex residents commute into London which approximates to £10.4bn GVA whilst 38,800 London residents commute to Essex which approximates to £2.7bn GVA per year¹.
- 1.4 By 2021 we are planning for over 117,745 new jobs; and over 81,310 new homes. Independent projections suggest that Essex will experience substantial demographic growth between 2014 and 2021. Analysis of 2013-based forecasts from the East of England forecasting model for the period 2014-21, suggest that Essex can expect to see growth in:
 - overall population of around 71,000 (4.9%);
 - the working age-population of 13,000 (1.4%); and
 - the number of households of some 33,000 (5.5%).
- 1.5 This amount of growth will exert pressures on our infrastructure, not only transport but education, health and social care and digital connectivity.
- 1.6 Due to the inter-connected relationship between Essex and its neighbouring counties and London growth in these areas will also affect our economy. For example the Upper Lea Valley is forecasted to generate 15,000 jobs and 20,000 new homes by 2021² whilst London Riverside is forecast to generate 16,000 jobs and 26,500 new homes.³
- 1.7 To keep businesses and commuters moving between Essex, London and beyond and ensure strong economic growth significant infrastructure investment is required:
 - improvements to surface access at Stansted airport – would enable the airport to grow its capacity;
 - the Lower Thames Crossing – would relieve congestion and speed up logistics;
 - a comprehensive solution to the lack of capacity at Junction 30/31 of the M25;
 - corridor improvements on the A12, A120 and M11 (including Junction 7a) – to connect centres of economic opportunity;

¹ Regeneris (2015) *Greater Essex External Economies Commission – Economic Linkages*

² City in the East

³ City in the East

- capacity improvements and integrated transport initiatives on the Great Eastern Mainline (GEML), West Anglia Mainline (WAML) (including 4 tracking) and opportunities offered by Crossrail 2 – to improve commuting and reduce journey times to London Stansted and London Southend airports and;
- investment in the London Underground Central Line and rolling stock, including station travel planning and interchange enhancements at Epping, Loughton, Buckhurst Hill, Chigwell and Roding Valley Stations – to improve commuting and support the night-time economy.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

- **How should they be prioritised, taking account of their response to London’s strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?**
- **What might their potential impact be on employment, productivity and housing supply in London and the southeast?**

2.1 We believe that future investment in large-scale transport infrastructure improvements in Essex will support growth in London and across the South East.

2.2 Essex County Council has identified four growth corridors where investment could help stimulate and support growth:

- London Stansted Cambridge Corridor (M11 and West Anglia Mainline)
- Haven Gateway (A120)
- Heart of Essex (A12 and Great Eastern Mainline)
- Thames Gateway South Essex (A127, A13 and Essex Thameside Mainline)

London Stansted Cambridge Corridor (M11 and West Anglia Mainline)

2.3 The west of Essex is part of the London-Stansted-Cambridge Corridor (LSCC), connecting London, Stansted and Cambridge, via the M11 and the West Anglia Main Line (WAML). The Corridor has enormous growth potential, particularly in Harlow, building on the local strengths in life sciences and other high value sectors for example Public Health England is moving its headquarters to Harlow.

2.4 London Stansted is the only airport in the South East with immediate capacity for significant growth. With a current planning application to support 35m passengers per year (up from 20m currently), there is capacity to increase this to 45m passengers per year by 2030. This could create an **extra 10,000 jobs** and **£4.6bn in additional economic activity**.

2.5 London Stansted airport is already successful in the leisure and tourism but future plans focus on attracting more business customers and increasing the number of long haul flights. The growth of both of these areas could provide a catalyst for growth across the East of

England, attracting inward investment and supporting key sectors such as life sciences (amongst others).

- 2.6 London Stansted is also a key handler of freight, handling 220,000 tonnes last year (the third biggest after Heathrow and the East Midlands) and there is potential with surface access improvements to grow this market as well.
- 2.7 Surface access improvements are critical to growth at Stansted Airport. The Airport will not be able to realise its true potential without investment in the following:
- M11 improvements focusing on junctions 7 and 8
 - A120 improvements, improving connections between the Haven Ports and the Airport
 - Four-tracking of the West Anglia Mainline, which will result in faster journey times from London
- 2.8 The Harlow Enterprise Zone provides a focal point for key sectors of significance to the UK and sub-regional economy including life sciences, advanced manufacturing and ICT with the potential to deliver over 51 hectares of employment land. Delivery has the potential to create over **5,000 jobs** and lever in over **£150 million in private sector investment**.
- 2.9 Improvements to M11 J7 and delivery of M11 J7a are required to realise the site's full potential.
- 2.10 It is hoped that Crossrail 2 will bring the desperately required four-tracking of the West Anglia Mainline to the London Stansted Cambridge Corridor and this should be prioritised.

Haven Gateway (A120)

- 2.11 The Haven Gateway Growth Corridor includes the districts of Braintree, Colchester and Tendring, and links Harwich International Port in the east to Stansted Airport and the M11 in the west via the A120. It is one of the key international gateways to the UK; home to Harwich International Port, one of the UK's leading multi-purpose freight and passenger ports, and supporting the neighbouring port of Felixstowe.
- 2.12 There is significant potential for growth at Harwich Port. Harwich has the potential to make a significant contribution to the offshore energy sector and is already supporting over 260 turbines, more than any other UK North Sea Port. It is well located at the centre of Europe's offshore wind activity and provides the sheltered conditions to support the growth of the offshore renewable sector. Harwich has recently been designated as a Centre for Offshore Renewable Engineering (CORE). This will provide additional support for businesses looking to invest in manufacturing for the offshore renewable energy industry, helping this sector to grow.
- 2.13 In the longer term, Bathside Bay has the potential to create a deep sea container port with road and rail links to the rest of the country. Around 101h additional land adjacent to Harwich Port is available which could attract **£300 million investment** and create at least **500 direct jobs** and many more indirect employment opportunities.

- 2.14 The **A120** links London Stansted Airport with Harwich International port and the local economies of Braintree and Colchester. Improvements along this route has significant potential to secure employment and housing growth along this corridor. It will connect the local workforce to two key international gateways and drivers of growth for Essex. Without the required improvements to the A120, the region will lose out on £1.3bn in growth and nearly 13,000 new jobs.
- 2.15 ECC is leading on the design and preparatory work for improvements to the A120, however firm commitment from Government to fund the scheme is required to ensure success.

Heart of Essex (A12 and Great Eastern Mainline)

- 2.16 The Heart of Essex growth corridor runs through the centre of Essex, linking London to the Haven ports, and onwards to Norfolk and Suffolk. The A12 and the Great Eastern Main Line (GEML) rail services link the key urban centres of Brentwood, Chelmsford, Colchester and Maldon to London.
- 2.17 The corridor has strong links with the London labour market, supporting substantial commuter flows to and from the capital. These links will grow and strengthen as Crossrail is completed, when new services will stop at Brentwood and Shenfield, both of which will benefit from planned improvement works to facilitate these new services
- 2.18 Additional investment in rail and road infrastructure is essential for unlocking the full economic potential of the Corridor, and a package of investment is proposed to address bottlenecks on the A12 to support growth.

Thames Gateway South Essex (A127, A13 and Essex Thameside Mainline)

- 2.19 The districts of Basildon, Castle Point and Rochford, along with the unitary authorities of Thurrock and Southend, form Thames Gateway South Essex (TGSE); part of Thames Gateway, the largest regeneration opportunity in Europe. Along this corridor the A13 links the key port infrastructure of Tilbury and London Gateway with London, while the A127 corridor connects the capital to the manufacturing hub of Basildon, and to Rochford, Southend, London Southend Airport and surrounding employment areas. Improvements to the road network in this area are vital to securing growth and inward investment.
- 2.20 London Gateway is the UK's first major deep sea container port and Europe's largest logistics park. It will provide access to the largest consumer markets in the UK and internationally. A significant port development for the UK, it occupies a 1,500 acre site and will provide 2,700 metres of quay and six deep water berths. The logistics park could provide nearly 1 million m² of accommodation. Together the development has the potential to create more than 12,000 direct, permanent jobs and more than 20,000 indirect jobs. The site is supported by the country's largest Local Development Order, developed by Thurrock Council to give confidence to occupiers to invest.

- 2.21 Port of Tilbury is one of the largest deep water ports on the River Thames and is the UK' leading port for forestry products with excellent links throughout the supply chain including shipping lines, importers, merchants and distributors. Work is currently underway to develop more than 940,000 sq. ft. of new high quality distribution facilities and 17 acres of haulage facilities adjacent to the port of Tilbury. The London Distribution Park development is expected to generate up to 1100 jobs and secure the long term prosperity of the port.
- 2.22 London Southend Airport has been one of Europe's fastest growing airports in recent years with over 1 million passengers in 2014. It has received over £130 million of investment since it opened in 2008, mainly from the private sector. A Joint Area Action Plan (JAAP) sets out detailed proposals for the development of London Southend Airport and the surrounding area. The Airport itself has capacity to support up to 5 million passengers per annum and 2 million by 2030. By 2021 it is expected that the airport will support an additional 2,000 jobs.
- 2.23 There is significant potential for growth, not only at the airport site but in areas surrounding this key hub. The Airport Business Park (ABP) to the North West of the Airport will create a million sqft of high quality employment space and over **6,000 jobs**. The proposals include a site for the Anglia Ruskin Medtech campus, which will create space and support for businesses in the medical technologies sector.
- 2.24 Currently, development is constrained by the limited capacity of the strategic road network, particularly J30/31 of the M25 and the dual carriageway stretch of the A13. The A127 also carries a volume of traffic comparable to a motorway in other parts of the country and has significant capacity issues which need to be addressed, particularly around Basildon, London Southend Airport and the Southend Central Area. Southend Borough Council and Essex County Council have developed a joint "A127 Corridor for Growth" economic plan to identify, plan and coordinate investment decisions and manage the asset.
- 2.25 The **A127** corridor which connects Basildon with Southend is vital to the economic competitiveness of the Thames Gateway South Essex sub-region and indeed to the economy of the County of Essex and beyond. It is located in the heart of the Thames Gateway which has been identified as being of national significance. Thames Gateway South Essex has an ambitious growth agenda to build on existing strengths and make the most of a unique combination of opportunities. Investment to improve capacity and flows along the A127 is therefore required to secure jobs and housing growth.
- 2.26 Bordering London to the west, the **A13 corridor** links the key port infrastructure of Tilbury and London Gateway with the capital. The corridor provides a significant growth opportunity and already benefits from major planned and committed private investments such as London Gateway (£1.5bn), Thames Enterprise Park (£1bn), Lakeside (£1bn), Purfleet (£600m) and Canvey Gateway (£110m). With the right investment, the A13 corridor will deliver 4,150 homes and 11,000 jobs by 2021. However, the road is currently constrained by its capacity. To unlock this growth potential, local authorities will invest £300m, however additional funding is required (in the region of £87 million).

2.27 Furthermore, the potential impact of the Lower Thames River crossing would be significant on transport routes in this corridor, with one of the two short-listed options being to connect the M2 in Kent with the A13 and the M25 between junctions 29 and 30.

2.28 In summary our priorities for investment are:

- **A127 improvements** – the A127 has significant capacity and reliability issues, as highlighted in the Inner Thames Estuary [ITE] Study on Surface access, and flows which need to be addressed if it is to maintain current jobs and aid the delivery of new jobs and housing growth along the corridor. The A127 carries in excess of 70,000 vehicles per day which exceed those on many urban motorways elsewhere in the UK.
- **Lower Thames Crossing** – another crossing is required to ease congestion across the Queen Elizabeth II Bridge and provide resilience in the area.
- **A120 corridor dualling** – we ask HM Government to consider our specific proposals on dualling the remaining sections of the A120 between Braintree – A12 and Hare Green to Harwich; the ports and logistics sector in this corridor has a turnover of £3bn per annum and employs over 32,000 people. With investment, the economy could grow by £1.3bn.
- **A12** – we are working closely with Highways England to design the improvement schemes announced in the 2014 Autumn Statement.
- **Creation of M11 J7a** – to provide stronger links between Stansted airport and the economic opportunities that exist for Growth within the Harlow Enterprise Zone.
- **Capacity improvements to M11 J8** – improvements on this already at capacity junction would support growth to Stansted airport as well as providing opportunities for housing growth locally.
- **Upgrading of the M11 north of the airport between J8 – J9** – to provide stronger and more efficient links between Stansted airport, and the economic opportunities that exist for Growth within the Harlow Enterprise Zone, Cambridge and wider region.
- **West Anglia mainline four-tracking** - along the Lea Valley between Tottenham Hale and Harlow to provide rail capacity to bring forward the delivery of 6,000 – 12,000 new homes and 2,000 – 5,000 additional jobs to support growth along the Lea Valley and wider London Stansted Cambridge corridor and, to enable a London – Stansted journey time of 30mins.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

3.1 We believe that delivering four-tracking of WAML outside of the Crossrail 2 programme would lead to an increase in benefits as commuters and airport passengers could travel more easily and reliably to and from the capital.

3.2 Further, there is potential to reduce costs by undertaking a scoping study into extending four-tracking and Crossrail 2 services to Harlow Town Station where there are marshalling and servicing facilities for trains already present that TfL could use.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

- **What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?**
- **What innovative funding mechanisms could be considered to support delivery of key schemes?**

4.1 We have a strong track record in forward funding and part funding large scale infrastructure projects and would be happy to share this knowledge and experience with the Commission.

4.2 As well as leveraging investment from local authorities, businesses, developers and (in the case of rail) operators we see no reason why additional taxation (enabled by Business Rate Legislation) could not be used to part fund significant infrastructure projects such as Crossrail 2 or a new Lower Thames Crossing. This has already been successfully applied for the funding of Crossrail and the London Olympics.

4.3 There is a robust evidence base to support the use of user charging to recoup the construction costs and pay for ongoing maintenance of road and river crossing infrastructure projects. This approach should not be discounted.

National Infrastructure Commission – Call for Evidence

Subject: London’s Transport Infrastructure – **Connecting East London – Low Level River Crossings**
To: National Infrastructure Commission (londonevidence@Infrastructure-Commission.gsi.gov.uk)
Prepared by: Farrells and BuroHappold Engineering
Date: January 7th, 2016

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

London’s population growth has accelerated to an extent much greater than anticipated, to a Victorian rate of change. A year ago, London’s population surpassed its 1939 peak of 8.6 million and latest predictions foresee London’s population exceeding 10 million by 2035. This creates opportunities, but also brings with it major challenges. London is one of the most thriving and growing urban economies. It is a centre for innovation, creativity, and culture. In order to remain the global city London is today and to lead the world in sustainable, resilient urban growth, London however needs to address its **most pressing challenges: Housing and infrastructure provision for a growing population and economy, social and economic inequality, and the impacts of climate change.**

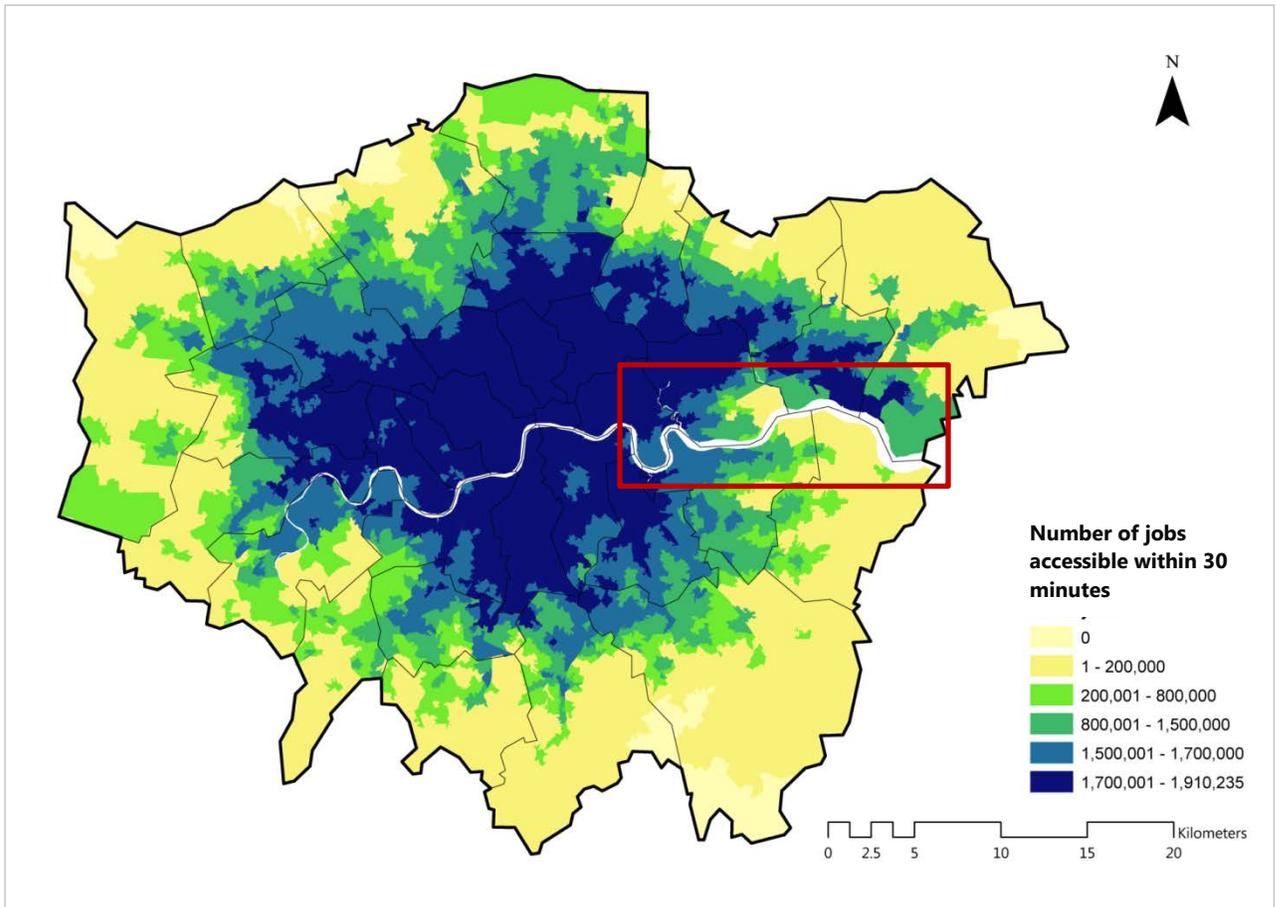
Providing **housing** for those already in London and its future population growth is one of the key challenges that London faces today. Official estimates assume the need to build almost 50,000 homes a year over the next twenty years, supply levels far beyond those currently achieved. With local authorities reducing or abandoning their housebuilding activities since the early 1990s, the private sector and housing associations have not managed to build more than 20,000 units per year on average. Moreover, London needs to provide these **homes for all income levels**. Around 70% of all homes need to be affordable – social rented housing, intermediate housing, and housing in the lowest market band – according to estimates. London has only managed to build around 2,000 homes for social and affordable rent per year since 2008.

Solving the housing crisis is as much about new housing policy, innovative financing and governance mechanisms, and technical innovation as it is about **spatial planning and unlocking land for development**. The GLA and TfL have responded to this with bold infrastructure projects, from the London Overground to Crossrail; and there are further ambitious plans (e.g., Crossrail 2) to increase accessibility of underserved areas in London. This will support both employment creation and home building at increased density. However, more needs to be done, across London

In recent times it has become clear that only **East London** has the spatial capacity and ability to accommodate growth on a larger scale. Shoreditch and Hackney have become desirable places to live and work whilst Canary Wharf has become a major finance centre with a mix of shops, homes, and a cultural offer with superb connectivity. The London Olympics Legacy has helped support growth in Tower Hamlets and Newham and the Royal Docks is at last attracting sustained investment. However, large areas of East London have seen little or no growth. A lack of transport accessibility (see Figure 1) has held back housing delivery in

East London and too much has consisted of low-density sprawl in featureless dormitory suburbs. While the London Plan identifies East London as the area with the greatest potential for growth (40% of the opportunity areas), it will be hugely challenging to find investors if land is not unlocked by making it more accessible to employment throughout London and the south east.

Figure 1: Accessibility to jobs



2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

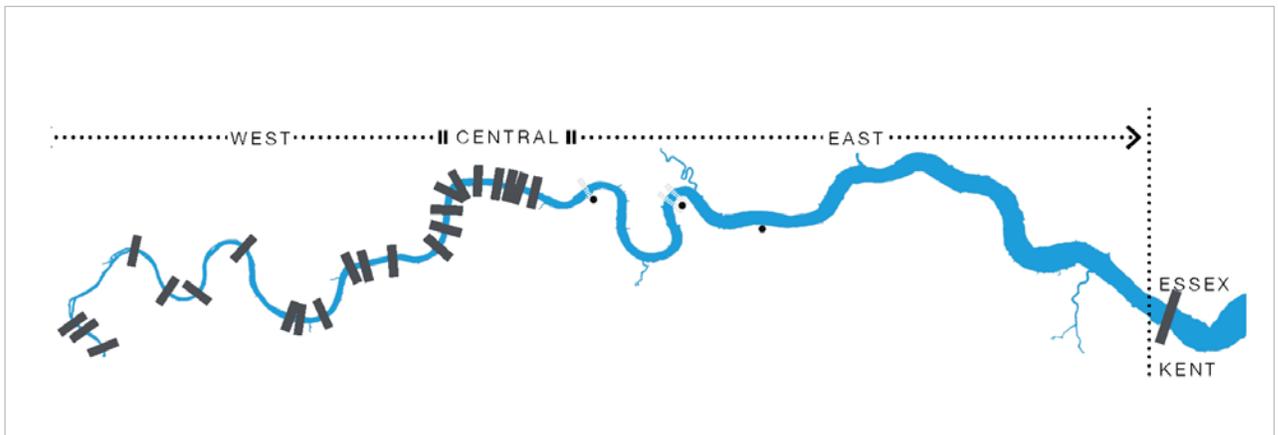
To address the challenges outlined above, **new river crossings in East London** should be part of any future investment in infrastructure improvements. TfL has started investigating different options and is preparing for the planning and construction of strategic through traffic crossings such as the Silvertown Tunnel, a crossing at Gallions Reach, and one at Belvedere. While necessary, these crossings will however not be sufficient to address the local accessibility needs of local communities that are being planned and built in East London. Moreover, these crossings – currently conceptualized as tunnels and high-level bridges – will sterilize large areas of land on either side of the river due to their long approach ramps, often stretching a mile back from

the river bank. Future investment in transport infrastructure therefore needs to include the building of **low-level bridges and other local crossings such as high frequency ferry services in East London**, enabling walking and cycling and conveniently connecting people to transport nodes on either side of the river – effectively extending the network of transport connections to the river.

Historically, West London grew and flourished because areas north and south of the river were connected by bridges, improving connectivity and unlocking new land for development. To provide one example: In 1842, the Commission of Woods, Forests, and Land Revenues recommended “the building of an embankment at Chelsea to free new land for development, and proposed the building of a new bridge downstream of Battersea Bridge” (Roberts, C. 2005. Cross River Traffic. London: Granta, p. 130).

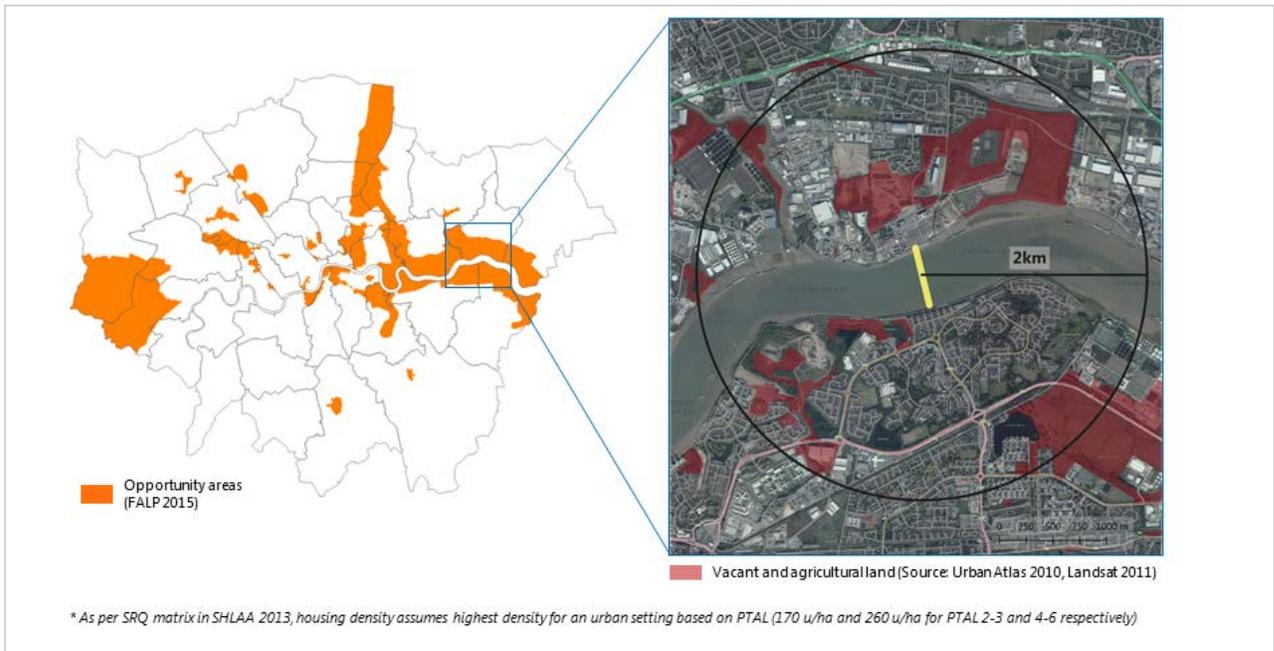
Currently, there are 34 bridges across the Thames, but **only one bridge east of Tower Bridge** – the high-level bridge at Dartford (see Figure 1).

Figure 2: Bridges across the river Thames



Building local crossings will help unlock land for housing development and improve job accessibility for existing and future communities. Analysis suggests that within a 2km radius of a potential bridge connecting Thamesmead with Barking Riverside, almost 50,000 new homes could be built (see Figure 3) – this is one year of the housing supply currently required for London’s growth. A bus connection over the bridge that would link Abbey Wood Crossrail station in the south with the future Barking Riverside Overground station in the north would increase job accessibility for existing and future communities in the area.

Figure 3: Housing capacity in Thamesmead / Barking Riverside



Low-level bridges will allow private and public developers to take advantage of increases in land value to **create vibrant urban communities** along the river front and further inland. It will re-connect settlements on the North and South banks with the Thames and **enhance the East London riverfront** through landscape restoration and the animation of the waterfront with shops, cafes, and public spaces for people to linger, walk, and enjoy. This addresses one of the key goals in the current Port of London Authority Vision (i.e., "Riverside as a magnet for ramblers, historians, artists, and others", PLA Thames Vision Consultation on Goals and Priority Actions, Dec 2015).

Low-level bridges will also help **reduce pressure on over-burdened parts of the transport network** by **providing sustainable alternative modes of transport**. With the development under way in North Greenwich and the Royal Docks, a low-level bridge could increase crossing capacity. TfL's *River Crossings: East of Silvertown Crossings* (Jul 2014) report demonstrates the need to increase capacity of the Woolwich Ferry crossing. It also shows that this crossing is mainly used by people originating in the boroughs north and south of the river. A low-level bridge will reduce the pressure on the Woolwich Ferry. It will also help achieve TfL's goal of reducing dependence on road-based transport and improve air quality. The same report indicates that road-based travel in East London is the main transport mode in connecting people to employment. Low-level crossings will improve the infrastructure for alternative modes of transport such as walking and cycling.

We are fully aware of the **challenges that low-level bridges pose to river traffic**. The River Thames poses several constraints due to its topography and its tidal nature. It requires highly experienced pilots to manoeuvre ships and the more obstacles in the river, the more difficult it becomes to manoeuvre. We are also aware of the cultural, environmental, and economic importance of the river traffic. In 2014, the port handled 44.5 million tonnes of goods and materials and provided direct employment for 27,000 people. 5.5 million goods and materials were moved between the wharves on the river, taking 550,000 lorry trips off the region's road (PLA Thames Vision Consultation on Goals and Priority Actions, Dec 2015). This reduces congestion on London roads, increases road safety, reduces greenhouse gas emissions, and improves air quality.

Taking these challenges into account, we however strongly believe that by exploiting today's smart traffic systems and the variety of designs for opening bridges, **both interests can be served; creating vibrant communities in East London while achieving PLA's goal of being the busiest ever Port of London.** Examples of other cities might be able to teach us something (see section 5 below).

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

Low-level bridges **can be more affordable** than high-level bridges and tunnels. Rough costing of a potential bridge between Thamesmead and Barking Riverside allowing for cycling lanes, walking space, and a one-way bus lane supported by sensors and lights showed that bridge construction between banks could be under £150 million – about fifty percent less than a high-level bridge (this does not include additional costs beyond the banks with approach works and ramps). This would potentially also be cheaper than TfL's idea of an Overground tunnel extension from Barking Riverside to Thamesmead (TfL, *New river crossings for London*, Dec 2015). A more detailed analysis and costing would of course have to be undertaken in order to move forward.

One of the fundamental principles that should govern infrastructure funding is that those that benefit most, should help pay for it. In regards to a low-level bridge, this **benefactor-pays** principle can be achieved through tolls by those using the bridge (especially if vehicles are allowed), land value capture mechanisms whereby land owners and developers are charged a fee as they are benefiting from increasing property values, or through business rates whereas businesses that profit from increased economic activity are charged a fee. The appropriateness of each of these financing mechanisms depends on the users the bridge serves (e.g., public transport, private vehicles) and the location (e.g., it might be easier to get funding from developers in locations where investment interest is already existent than in locations where land still needs to be unlocked).

There is also a **rationale for public investment** as the socio-economic benefits of regeneration in a traditionally deprived and underserved area as well as the opportunity to unlock land for much needed housing largely outweigh the costs involved. Contributions from national government and the GLA would demonstrate their commitment to a more balanced growth in London. Boroughs could make contributions as they will benefit from tax revenue growth from increased economic activity and population growth.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

While we appreciate that each city deals with different opportunities and challenges and each river has different physical constraints, there are examples that show how local bridges can improve accessibility and unlock development and how the technology of opening-bridges can work in other cities.

Baakenhafen Bridge, Hamburg

The Baakenhafen bridge in Hamburg is a local vehicle, pedestrian, and cycling bridge that connects two areas of the new district Hafencity and greatly increases accessibility to Hamburg's inner city. The construction of the bridge allowed for the development of 1,800 housing units, shops, offices, and community spaces. Without the bridge, development would have been much harder to achieve.

Ponte della Musica, Rome

The Ponte della Musica crosses the river Tiber in Rome and connects the former Olympic stadium on the west bank of the river with the Quartiere Flaminio for the first time in a 1,000 years. The bridge was designed to

serve as an open public space that can be used for festivals, exhibitions and fairs. It also has the facility to operate as a tram and bus route. It connects Rome's most significant cultural institutions and provides ease of access for residents to enjoy these institutions fully.

The New Botlek Bridge, Rotterdam

The new Botlek bridge across the Oude Maas in Rotterdam is an example of advanced bridge technology. It is one of the largest moveable bridges in the world. The bridge will be opened around once every hour, or 9,000 times per year and only 120 seconds are required for the entire opening or closing procedure. The bridge will remove a bottleneck for ships, caused by the existing low and narrow moveable bridge's limited navigation clearance while also improving the flow of road traffic.

Kattwyk Bridge, Hamburg

The Kattwyk bridge across the South Elbe in Hamburg is an opening bridge across a tidal and curvy river that opens during the day every two hours for river traffic. Built back in the 1970s, the opening mechanisms is not as fast as the new Botlek bridge and disrupts vehicle traffic across the river for about 15-20 minutes each time.

January 2016

Dear Sir/Madam,

National Infrastructure Commission: Call for Inputs

FSB welcomes the opportunity to respond to the above named consultation.

The FSB is the UK's leading business organisation. It exists to protect and promote the interests of the self-employed and all those who run their own business. The FSB is non-party political, and with around 200,000 members, it is also the largest organisation representing small and medium sized businesses in the UK.

Small and medium-sized businesses make up 99.9 per cent of all businesses in the UK, and make a huge contribution to the UK economy. They account for 47 per cent of private sector turnover and employ 60 per cent of the private sector workforce.

Transport infrastructure is vitally important to small businesses across the country. Small business owners in the North, London and across the UK report a range of challenges they face which are hindering the economic development of their business. If the National Infrastructure Commission is able to improve the planning and delivery of major infrastructure projects, small businesses will have greater opportunities to expand and compete internationally.

We trust that you will find our comments helpful and that they will be taken into consideration.

Yours sincerely,



Mike Cherry, Policy Director, AIMMM FRSA

FSB

FSB response to the National Infrastructure Commission: Call For Inputs

January 2016

The evidence submitted to this call for inputs is primarily based on surveys carried out on a survey panel of our members. The FSB Big Voice survey panel is made up of nearly 6000 small business owners, who are regularly surveyed on a range of different policy issues. This survey panel is broadly representative of the wider small business community. Surveys are administered by an independent research agency which is a signatory of the Market Research Society's Code of Conduct.

FSB also receives views from our members via a federated regional structure which allows small business owners across the country to raise areas of concern to them at a national level. For the purposes of responding to this call for inputs, we spoke to representatives of the FSB in regions across the North and in London, in order to ensure we accurately represented the views of small business owners.

CONNECTING NORTHERN CITIES

1. To what extent are weaknesses in transport connectivity holding back northern city regions (specifically in terms of jobs, enterprise creation and growth, and housing)?

Improving the transport connections in the North is a top priority for FSB. Weakness in transport connectivity is holding back growth among small businesses in northern city regions.

The agglomeration benefits which firms in London and the South East derive from a generally strong transport infrastructure are not delivered for smaller businesses across the North. This makes it increasingly difficult for smaller businesses in the North to compete. Without further investment in transport infrastructure to bring Northern regions together, it will remain challenging for smaller businesses to develop in the North.

The APPG on Small Businesses – supported by FSB - published a report into the drivers of productivity in March 2015. This inquiry took evidence from a range of different stakeholders, finding that a lack of transport connectivity hindered productivity levels in different regions.¹

We would highlight the wide discrepancies in per capita infrastructure spending between the North and other regions of the UK which have been found by IPPR North.² This points to a broader issue with historic levels of under-investment in northern infrastructure having left the region relatively underdeveloped and with poor intra-regional connectivity.

Small business owners have also pointed to a lack of transport infrastructure as holding back their ability to connect with suppliers, customers and employees, particularly in rural areas. The declining quality of public transport and generally poor upkeep of the minor road network

¹ APPG on Small Businesses Report on Productivity: Available at http://www.millionplus.ac.uk/documents/All_Party_Parliamentary_Small_Business_Group_Productivity_and_Small_Firms_productivity_report.PDF

² IPPR North, Transformational Infrastructure for the North, August 2014

has meant that rural small businesses can struggle to compete against national and international competitors which have access to superior transport networks.

We would therefore urge the Commission to not just focus on urban and city to city transport infrastructure, but also to consider travel to work routes between cities and the rural hinterlands where many small businesses, their customers and their employees are based.

2. What cost-effective infrastructure investments in city-to-city connectivity could address these weaknesses? We are interested in all modes of transport.

In a recent survey, FSB asked small business owners what modes of transport were of importance to their business. The results were as follows:

Table One: How important are the following modes of transport to your business?³

	Car	Van	Lorry	Bus	Train	Walking	Cycling
Important	93%	64%	49%	32%	33%	39%	22%
Unimportant	2%	12%	20%	27%	28%	24%	32%

We also asked how important road access was to their business, and how important the public transport network was to their business.

Table Two: How important is the road network / public transport access to your business?⁴

	Road network	Public transport
Important	88%	36%
Unimportant	3%	30%

It is clear that the vast majority of small businesses still rely heavily on the road network for their cars, vans and lorries. This is reflected in the high importance attributed to both the road network and for private car, van and lorry use.

However, public transport is important to a significant percentage of small business owners, where over a third still place value on access to public transport. Close on half of businesses in urban areas (48%) were likely to view public transport as being important, reflecting the benefits that a well functioning urban public transport network can provide.

³ FSB Big Voice survey, Rural Transport, September 2015. Base 1352 responses

⁴ FSB Big Voice survey, Rural Transport, September 2015. Base 1352 responses

For reference, and outside the scope of this section of the call for inputs, 65 per cent of London based businesses value the public transport network, providing further evidence that where public transport works, it provides an important service for small businesses.

Investment in the road network is therefore the most important priority for small business owners. This should not simply reflect investment in the Strategic Road Network or city to city links, but should also include the minor roads which form a key part of the door to door journey for small business owners, their suppliers and their employees.

We also note that many inter-city rail connections continue to rely on old rolling stock and carriages which can hinder capacity. Making additional investment in upgrading the rolling stock used on these routes could be more effective in increasing capacity than making larger scale investments in new or upgraded routes.

3. Which city-to-city corridor(s) should be the priority for early phases of investment?

FSB has argued in previous submissions to the Chancellor that a new tunnelled, trans-Pennine road route between Manchester and Sheffield would provide an important new city-to-city corridor in the North.

Many small businesses are not however based in cities, and do not necessarily place high value on access to city-to-city corridors. Instead, they look to the transport network to connect rural and semi-urban areas to city and town centres.

There is widespread concern among small businesses that new devolution deals will primarily benefit cities rather than the rural hinterland. It is important that existing, and future, devolution deals include mechanisms to ensure that the needs of rural areas are also addressed.

Small business owners in the North East also raised concerns that the 'Northern Powerhouse' will be primarily focussed on the Manchester-Leeds corridor. In their view, this would be a mistake as much-needed investment in the North East, including around Newcastle, would be missed. East to West connectivity across transport modes is as important to increase agglomeration benefits as connections through to London are.

As a federated organisation, FSB has not taken a position on specific infrastructure projects or city to city corridors, as small business owners across the North have told us that the general state of poor transport infrastructure is hindering the growth and economic potential of their business.

4. What are the key international connectivity needs likely to be in the next 20-30 years in the north of England (with a focus on ports and airports)? What is the most effective way to meet these needs, and what constraints on delivery are anticipated?

The top priority for FSB in terms of international connectivity is to improve runway capacity in the South East. We recognise that this is a decision which has been specifically excluded

from the remit of the National Infrastructure Commission. Setting aside the question of overall aviation system capacity, it is clear that more should be done outside the South East to improve international connectivity.

Whilst aviation is a lower priority for small businesses compared to the road and rail network, some small businesses do see it as important. FSB asked small business owners about how important air travel was to their business in a 2013 survey.⁵

This survey found that 27 per cent of small businesses placed at least some importance on aviation for their businesses. This importance could reflect the importance of access to freight opportunities, but could also reflect the value that some sectors, such as the tourism industry, place on aviation access. Other small business owners, especially those who export, will also often need to fly in order to meet with potential or existing clients and suppliers. Therefore continued improvements to regional airports and the destinations they serve is important.

A key issue which has repeatedly been raised is delivering improvements to surface access connectivity to airports. For small business owners, the time taken to complete a door-to-door journey is critical. This means the length of time taken to access any given airport is given weight when deciding on which airport to travel from. Business owners were especially critical of the poor surface access to Leeds-Bradford airport, which was viewed as a particular impediment in choosing to fly from there. Drop off charges at this airport are also expensive, which increases the cost of flying from this airport. The Commission should look to prioritise improvements to surface access to regional airports across the North as a key way to incentivise further export growth.

Digital infrastructure plays a key role in developing international connectivity

Digital connectivity does not appear to be within the scope of the Commission at the current time. We view this as a mistake, as digital connectivity is now critical to allowing small businesses to trade overseas. FSB has published extensive research looking at the benefits of digital connectivity, along with the barriers stopping small businesses from doing more online.^{6,7} Ofcom have echoed our findings that a lack of digital infrastructure is a key barrier stopping small businesses from making full advantage of the benefits offered by using digital tools.

As a consequence, we believe the Commission should consider investigating the provision of digital infrastructure, particularly to small businesses, as a future priority.

5. What form of governance would most effectively deliver transformative infrastructure in the north, how should this be funded and by whom, including appropriate local contributions?

⁵ FSB The Voice of Small Business survey panel, Infrastructure Survey, April 2013

⁶ FSB, Reassured, optimised, transformed: driving digital demand, September 2015

⁷ FSB, The Fourth Utility, July 2014

One concern which has been raised following the creation of Transport for the North and the National Infrastructure Commission is the precise breakdown of roles and responsibilities for planning and delivering transport infrastructure in the North. The role of local councils, LEPs and combined authorities also may need clearer definition following these changes.

The failure of the Government to follow the recommendations of the Davies Commission on airport capacity raises broader issues about the effectiveness of a Commission-led model to deliver transformative infrastructure. If the Government is under no obligation to follow the recommendations of the National Infrastructure Commission, we are concerned that future Governments will simply erect barriers to avoid making a definitive judgement on any recommendations from this body. Without some form of safeguard such as a legal obligation to respond to recommendations within a certain timeframe we are unsure that the Commission will be effective.

Small business owners would like clarity over which body is best placed to address specific areas of concern aside from which body will be responsible for the delivery of transport infrastructure.

FSB has been generally supportive of the new devolution deals which are being created, and views the creation of strong combined authorities with the power and accountability to deliver local priorities as an important and welcome change.

However, one challenge for these new authorities will be the varying levels of power which has been devolved to them. For instance, in the transport space, some combined authorities have power over buses in their area, whereas others do not. As combined authorities proliferate, there is a risk that effective planning across regions may be hindered as different combined authorities have different powers to address different issues. This was viewed as a particular problem in the North East, where the lines of accountability and authority between national Government, combined authorities and Transport for the North were viewed as unclear.

A second challenge facing combined authorities is that stronger, more effective combined authorities will be better placed to compete for funding streams. While this makes sense from an accountability perspective, business owners are concerned that their region may miss out on investment opportunities if their combined authority consistently fails to put in competitive bids for funding. Regions or rural communities outside of combined authority areas similarly may be disadvantaged when competing for limited investment opportunities.

At the same time, we recognise that if a combined authority is able to make a strong case for investment in transport infrastructure in a particular region, this suggests they may be better positioned to effectively manage the delivery of infrastructure. The National Infrastructure Commission should play a role in ensuring that new projects are effectively prioritised to provide the greatest economic benefit to the country.

LONDON'S TRANSPORT INFRASTRUCTURE

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

FSB have published a London manifesto ahead of the 2016 Mayoral Election which sets out our policy priorities for the next London mayor.⁸ This manifesto highlights some of the challenges which small businesses in London are currently facing with regards to transport infrastructure.

Commercial and residential rents are increasing the pressure on the transport network

As commercial rents increase across London, we are concerned that small businesses will increasingly be priced out of prime locations, particularly those in central London. This will affect the ability of small businesses to access the economic benefits offered by being based in London.

Recent FSB surveys have also shown that there is considerable concern among small business owners about the cost of housing in the capital. 22 per cent of small businesses said that the cost of housing had negatively impacted their business over the past four years; 13 per cent said high housing costs had impacted their ability to retain staff and 7 per cent said it had affected their level of productivity.

Permitted developments rights, which have been encouraging the change in use for commercial buildings to residential properties will only serve to exacerbate the issue.

Assuming that house prices continue to push Londoners further away from the main areas of employment, small businesses will rely even more heavily on a robust, effective and integrated transport system to carry commuters to their places of work.

Capacity on London public transport is also becoming a constraint on growth opportunities

As London's population increases, capacity on the London transport network will similarly become increasingly constrained. This again will have a detrimental effect on the ability of small business employees to travel to and from work.

Public transport is very important to London-based small businesses, as this is a key way for customers, suppliers and employees to access business premises. Owing to London's dense public transport system, small business owners were significantly more likely to view public transport as more important to their business compared to business owners in the rest of the country.

⁸ FSB London manifesto, November 2015. Available at [HTTP://WWW.FSB.ORG.UK/DOCS/DEFAULT-SOURCE/FSB-ORG-UK/FSB_A4_LONDON_MAYOR_MANIFESTO.PDF?SFVRSN=0](http://www.fsb.org.uk/docs/default-source/fsb-org-uk/fsb_A4_LONDON_MAYOR_MANIFESTO.PDF?SFVRSN=0)

Table Three: How important is public transport to your business?

	London	UK
Important	65%	36%
Unimportant	17%	30%

44 per cent of small business owners in London viewed public transport access as 'very important' to their business, compared to just 14 per cent of small business owners nationwide.

Small business owners with businesses in London raised different issues when asked to select three top issues affecting their use of the road network when compared to business owners in other parts of the country.

Table Four: What are the top issues in the road network affecting your business? (three selected from list)

	London	UK
Congestion on local roads	63%	45%
Parking availability	35%	22%
Congestion on motorways	30%	26%

Congestion and a lack of parking were therefore viewed as the two main issues affecting London based small businesses. These results are significantly different to the views expressed by small businesses based in other areas of the country, who were more likely to view potholes and frequent road works as the most significant issues.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

- **How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?**
- **What might their potential impact be on employment, productivity and housing supply in London and the southeast?**

The successful delivery of Crossrail 2 represents the main priority for FSB in terms of improving London transport. Funding for this project should primarily come from the private sector. Where public financing is necessary in the form of Business Rates Supplements, we

would like thresholds, similar to those put in place for the Crossrail I project, in order to exempt the smallest businesses from paying a supplementary charge.

More generally, FSB believes that the ability to raise business rates to pay for infrastructure projects should be contingent on the support of the wider small business community. A similar process to the adopted within the Business Rates Supplements Act 2009 should be considered for infrastructure financing.

For further information

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Freight on Rail response to Call for Evidence to National Infrastructure Commission:

This is the Freight on Rail response to the National Infrastructure Commission (NIC) call for evidence on the terms of reference listed.

Freight on Rail, a partnership of the rail freight industry, the transport trade unions and Campaign for Better Transport, works to promote the economic, social and environmental benefits of rail freight to local, devolved and central Government in the UK and to the European Commission, Parliament and Council of Ministers.

Summary

In addition to the terms of reference, covered in our sections A, B & C, we would like to make key general points, which are not only relevant to all three NIC terms of reference but also to the vast majority of NIC future infrastructure schemes.

NIC needs to take into account the socio-economic benefits of rail compared to HGVs which impose high external costs on society which are not internalised. Government policy, as a whole including the NIC, should set equitable transport policy across the modes which takes into account these market distortions. (See section 6)

Our response is comprised of key general points with headings below, explained in detail in sections 1-7 followed by our response to your terms of reference in sections AB & C.

The general points are covered under the following headings below:-

Growth of rail freight and its importance to UK PLC

Infrastructure Commission should make using rail a planning condition

Road and rail complement each other as part of the logistics solution

Rail's role in delivering to cities and transhipping to last mile low emissions deliveries

Land use planning

Lack of a level playing field between modes

Upgrading key rail routes can significantly reduce road congestion on key strategic corridors

1. The growth of rail freight and its importance to UK PLC

Both the Secretary of State for Transport, Patrick McLoughlin and the Rail Minister Claire Perry have voiced their support for rail freight. In June 2015 Claire Perry commented on *'the*

remarkable rise of rail freight' at the Rail Engineers Forum conference in June 2015. She highlighted rail freight's excellent record to date and its forecasted growth in two key market sectors saying that the Government wants to work with the rail freight industry to remove barriers that inhibit that growth.

On December 9th 2015, the Secretary of State endorsed her statement saying "*that the story of our modern rail industry is amazing and freight is a key part of that. We want rail freight to grow much further because demand to going to keep increasing*".

Consumer traffic has grown by 30% since 2006/7 and grew 5% in the last full year14/15.

Construction traffic increased by 17% in 2013/14 and 10% last year with 2.5 per annum growth forecasted. The decline of coal traffic has been largely anticipated and forecast although the scale of the decline was sharper than expected; coal traffic was down 61% in the first quarter of 2015/16. So the Government and devolved bodies need to work together with the industry to provide a network which can cater for more consumer rail traffic and construction traffic, both forecast to expand, to replace the coal traffic.

Industry Forecasts show intermodal rail traffic will quadruple by 2034

Consumer rail traffic is forecast to quadruple by 2034. Construction traffic 2.5% annum growth forecasted. But forecast are dependent on upgraded network and existing market conditions.

Retention of the mode shift benefit grants are important to overcome the lack of a level playing field between HGVs and rail. See section 6

2. **Infrastructure Commission should make using rail a planning condition** during construction phase of infrastructure projects for the delivery of raw materials and removal of spoil because of its lower external costs than road freight. The nearest railhead should be used whether building roads, rail, power stations or airports, using nearest railhead. The Olympics, Crossrail and Terminal 5 are good case studies of demonstrating the benefits of this approach.
3. **Road and rail complement each other as part of a logistics solution** by each playing to its strengths. As well as its bulk commodity markets, rail is well placed to offer the long-distance

trunk haulage for consumer traffic, as demonstrated its 30% growth since 2006/7 and its sustained 33% market share for the past few years, including in 2014/15.

4. Rail's role in delivering to cities and transhipping to last mile low emissions deliveries

A growing number of cities in the UK need to reduce air pollution to comply with EU regulations as seen by the Supreme Court ruling on London's air pollution violations. By 2020 Leeds will not be compliant with EU NOX regulations. Rail has far lower NOX emissions and lower particulates which are the key air quality problems. Two separate Colas Rail trials with TNT and Stobarts into Euston have proved that specialist freight trains can come into the heart of cities where the cargo can then be discharged into low emissions vehicles. Similarly, if rail connected consolidation centres are set up on the edge of conurbations rail can be part of the logistics solution by transporting the goods long-distance and then transhipped to low emissions vehicles for final urban deliveries.

5. Land use planning

We believe the NIC needs to be cognizant of the importance of land use spatial planning in delivering national infrastructure. Without coherent and integrated spatial and transport planning, the NIC, TfL and TfN will find it difficult to deliver the required rail upgrades. TfN can set the overall spatial planning framework for the North and direct local authorities to safeguard suitable sites and rail alignments for potential rail use in their Local Development Frameworks. For rail freight, it is crucial that local and regional authorities protect suitable sites for terminals for future potential use because there are a limited number of suitable locations which have the necessary rail and road connections. The Government's National Network National Planning Policy which includes the Strategic Rail Freight Interchange policy would support applications for SRFIs nationally significant infrastructure projects in the planning system.

6. Lack of a level playing field between modes

All levels of Government must take into account the scale of subsidy given to HGVs and the level

of external costs unpaid by the sector in their transport planning; HGVs impose almost ten times more external costs on the economy and society than rail freight. The latest research carried out for the Campaign for Better Transportⁱ using DfT values, found that HGVs pay less than a third of their costs, such as road congestion, road collisions, road damage and pollution which equate to an annual subsidy of around £6.5 billion. These conclusions are in line with a MDS Transmodal study in 2007 which found a very similar amount of underpayment: £6billion. The Government needs to recognise HGV costs in discussion about rail freight costs so that policy implications can then be understood in both directions with road and rail being examined across the piece. The level of HGV subsidy makes a compelling case for supporting rail, which imposes much lower costs on society and the economy, equivalently.

7. Upgrading key rail routes can significantly reduce road congestion on key strategic corridors

Research commissioned by CBT looked at specific routes which typically tend to be more congested because of more long-distance HGV traffic, particularly to ports. Its key findings were that:

- a) Some parts of road network have more long distance HGV traffic which could be carried by rail
- b) The impact of additional traffic in already congested conditions is far greater than a simple increase in pcu or vehicle kilometres suggest – it rises exponentially.
- c) In congested conditions each single per cent increase in traffic causes several percentage increase in congestion. In fact, Department for Transport figures state that a modest decrease in traffic of around 2%, results in congestion falling by 10%. DfT figures show that on congested parts of the network, congestion could be three to four times the percentage reduction in overall traffic levels, using a simple low congestion impact multiplier of 3-4.

The research found that in key corridors, such as the Trans- Pennine, London to East Midlands, Felixstowe to the North, Southampton to the North, Yorkshire and NE including M1 and A1, which all suffer severe congestion at peak hours the transfer of freight to rail could be significantly alleviate road congestion by removing HGVs.

<http://www.bettertransport.org.uk/sites/default/files/research-files/Freight%20mode%20switch%20report%20d6.pdf>

Importance and strength of rail freight as part of the logistics solution.

- Rail freight generates more than £1.6bn a year in economic benefits for UK PLC through improved productivity, reduced congestion and wider environmental benefits.
- Rail freight transports goods worth over £30bn a year, ranging from high end whiskies and luxury cars to supermarket products, cement and coal. Rail moves one in four of the containers entering the UK and half of the fuel used in electricity generation.
- The Hendy Review, which was tasked with reviewing the status of the Network Rail enhancement projects, acknowledged rail freight schemes deliver very high value for money. It stated that the average benefit cost ratio for rail freight schemes is between 4 to 5ⁱⁱ, which demonstrates that rail freight upgrades offer significant socio-economic benefits to the UK. Targeted infrastructure interventions work; the gauge enhancements out of the port of Southampton resulted in rail's market share increasing from 28 to 36% within a year of the completion of the work.
- **Terminals help regenerate local economies**
Local and regional authorities and LEPS therefore need to take into account the fact that rail freight terminals bring local re-generation benefits. Strategic rail freight interchanges (SRFI) can employ large numbers of staff directly. Daventry SRFI now employs around 5000 staff which will rise to 9000 when current expansion is finished. There is scope for terminals of all sizes which need new road/rail works.
For example, LEPS could help fund new roads to SRFIs and rail connections to the network for terminals through the Local Growth Funds.
- Rail freight industry has invested over £2bn since the mid 1990s

Rail freight's socio-economic benefits to society and the economy

- Rail freight is safer than road freight, HGVs are more than 6 times likely to be involved in fatal accidents than cars on local roads. *Source: Traffic statistics table TRA0104, Accident statistics Table RAS 30017, both DfT*
- Transfer to rail can reduce road maintenance costs as HGVs have an adverse impact on road infrastructure. The heavier HGVs are 160,000 times more damaging to roads than the average car- Source 4th Power law. This was shown by the high HGV charge for the M6 toll road, a private venture.
- Congestion benefits of rail freight - road congestion is now costing around £24 billion per annum according to the Freight Transport Association; the heaviest freight train can remove a 160 long distance HGVs from our roads – *Source Network Rail June 2010 Value of Freight.*
- UK rail freight produces 70% less Carbon dioxide emissions than the equivalent road journey- *Source DfT Logistics Perspective Dec 2008 P8 section 10*
- Energy efficiency of rail
A gallon of diesel will carry a tonne of freight 246 miles by rail as opposed to 88 miles by road – *Source Network Rail July 2010*
- Rail freight produces almost 90% less PM10 emissions than road freight and up to fifteen times less NOx emissions – DfT Logistics Perspective Dec 2008 P8 paragraph 10
- Damage and costs of main pollutants from transport
Road transport is the source of 80% of NOx in problem areas which rail can help reduceⁱⁱⁱ.

B.London's Transport Infrastructure

Protection of freight paths on the North London Line (NLL) and West London line (WLL)

These paths are vital to rail freight services irrespective of any extra capacity coming on stream out of the port of Felixstowe as they are needed for the following

- i) Two thirds of rail freight traffic has a London destination and that freight paths are not during rush hours.
- ii) The vast majority of London Gateway traffic will need to use the NLL.

iii) London Gospel Oak Barking electrification should include freight links to WCML and London Gateway.

There should be protection of potential and existing rail freight terminal sites beside railway lines with good road links for terminals of all sizes. As there is for riverside wharves which are protected through a GLA act. Rail sites should get the same protection as wharves. In the past, there was the SPG land for industry and transport.

Need both Strategic Rail Freight Interchanges for consumer products and more terminals for aggregates and other bulk products.

iv) Consolidation centres should be rail connected, as rail is well placed for long distance consumer traffic as well as traditional bulk commodities, to compete with road which would also have transshipment costs into smaller low emissions vehicles for example.

e) Channel Tunnel services into London were growing especially since the HS1 access to Barking Terminal and the reduction in CT charges but severely damaged by security issues at the CT.

C. Delivering future-proof energy infrastructure

Make using rail a planning condition for transportation, where practical, to reduce adverse impacts. Rail is currently used in the biomass and nuclear industry.

Philippa Edmunds Freight on Rail Manager January 2016

ⁱ Addendum to Metropolitan Transport Research Unit MTRU 2014 report February 2015. Heavy Goods Vehicles – do they pay for the damage they cause 2014

ⁱⁱ Ref 28 Hendy Review

ⁱⁱⁱ NOX costs the UK 6576 euros per tonne, in urban areas PM2.5 costs 194751 euros per tonne. Source Ricardo-AEA et al - Update of the handbook on external costs of transport 2014 using figures for 2010.

FTA Submission: National Infrastructure Commission call for evidence - London



January 2016

About FTA

The Freight Transport Association is one of the UK's largest trade associations and represents over 14,000 members relying on or providing the transport of freight both domestically and internationally, to or from the UK. Our members include hauliers, freight forwarders, rail and air freight operators, through to customers – producers, manufacturers, wholesalers and retailers. They cover all modes of transport – road, rail, air and sea. FTA members operate over 200,000 commercial goods vehicles on the roads in the UK; which is more than half of the UK fleet of goods vehicles. FTA members also consign around 90 per cent of goods moved by rail and around 70 per cent of goods moved by air and sea.

Introduction – UK infrastructure and logistics

FTA is pleased to be responding to this call for evidence. Infrastructure development in the UK has for too long been focused too much on the short term, stop start in its funding and has failed to adequately address national/regional needs in the face of local considerations. This has particular implications for freight as logistics is an inherently pan-national activity.

The efficient movement of goods is crucial to our society. Sometimes it is hard to remember the full scope of what is freight. At one end it is the heavy bulk movements like the construction material that makes our buildings and the waste that is taken away from our cities every day. At the other end, the book that is delivered to your house is also freight. Every cup of coffee you buy in a café is freight. Every piece of food on the shelves is freight. Every package of documents delivered to an office is freight. Every component or raw material used to supply a workshop is freight.

Without logistics society would grind to a halt overnight. In practical terms, everything that makes logistics less efficient adds to the cost of living and of doing business in the UK – everything that removes inefficiencies aids our development.

This is true of social objectives as it is of economic efficiency. More efficient logistics (through optimising mode used and ensuring free flowing movements) would help address emissions and safety issues – priority issues for FTA's members.

We look forward to working with the National Infrastructure Commission to help address the UK's needs as regards transport networks.

In the rest of this document, FTA will respond to the challenges identified and questions asked where they are relevant to our area of interest.

Response to Call for Evidence: London's transport infrastructure

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

London's population is expected to reach over 10 million people by 2030. This will increase demand for both personal travel for commuting and leisure purposes and also increase demand for deliveries and servicing activity. Due to the nature of the operations (ie final delivery to the customers' door) the vast majority of urban deliveries will always be made by road – therefore meeting the freight needs of the increased number of residents and increased economic activity in London will be a major challenge. Decisions will have to be made about the most efficient use of limited road space.

Transport for London estimates that central London congestion will grow by 60% by 2031. FTA believes that action needs to be taken now to secure the long-term sustainability of London if it is to maximise its competitiveness and attractiveness as a world city.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

- How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?
- What might their potential impact be on employment, productivity and housing supply in London and the southeast?

Future investment in large-scale infrastructure improvements should not just be aimed at solving current pinch-points, but also unlocking new areas for development. All too often, the transport infrastructure to support new development is an afterthought, and the true economic potential is not realized due to poor connectivity. East London is the prime example of a growth area with poor transport links, particularly cross-river road connectivity. However, Transport for London is now seeking to redress this with plans for a network of new road river crossings in East London – these plans must be fulfilled

Investment in public transport and alternatives to driving, to remove the reliance on private cars, is key to reducing congestion - freeing up space for essential or efficient traffic such as freight, tradespeople, pedestrians, cyclists, and disabled drivers.

However, investment in the core, motor-traffic oriented, road network should not be excluded and it is important to consider how various schemes interact with one another. It is essential that we achieve a sensible balance between the needs of different transport users so that we make best use of limited road space to benefit London overall.

For the freight industry, journey times are important, but arguably what is even more important is journey time reliability. If journey times significantly increase or there is a poor level of certainty about journey times which could result in reduced productivity per shift, due to the constraints of EU drivers hours rules, we will see transport operators having to put more HGVs on the capital's roads leading to increased transport costs, congestion and emissions.

London needs increased road capacity in key areas – river crossing in east London being the first example, but across London improved roads will be needed. There are social impacts from increased road use – ie emissions and safety. FTA believes that in the timeframes we are talking about here these should be addressed through improved vehicle technology – not through restricting the improvement of infrastructure at key pinch points and congested areas.

If the logistics industry is to successfully serve the needs of London's increased population and consequently increased business activity, it will require a more efficient road network than currently exists. In the case of freight more infrastructure will not exponentially increase traffic as our industry only moves the quantity of goods that society requires of us.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

- What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?
- What innovative funding mechanisms could be considered to support delivery of key schemes?

All funding options should be considered. However, we need to be careful of private ownership of key infrastructure – the Severn Crossing on the M4 is a prime example of where such a move can lead to high user charges long after the capital costs have been recouped. FTA accepts that user charges may need to be introduced to both fund new infrastructure and to manage demand. However, any demand management measures implemented on new schemes should be focused on those who have alternatives (such as private car drivers) rather than essential delivery vehicles which have little alternative option but to use the capital's road network. This is to ensure that there is an appropriate deterrent effect on those who in the main have an alternative choice – to use public transport – and to avoid additional cost to essential deliveries and servicing activity which has limited modal shift opportunities in the capital.

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15th January 2016 (by arrangement with the NIC)

Thank you for the opportunity to comment in the call for evidence:

<https://www.gov.uk/government/consultations/national-infrastructure-commission-call-for-evidence/national-infrastructure-commission-call-for-evidence>

We wish to make some points in relation to section 3 on London's transport infrastructure.

We include as Annex 1, and refer you to, our submission to the London Assembly Regeneration Committee inquiry into Transport-led regeneration.

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

Economic and social challenges which face London must be considered and dealt with together with environmental challenges, according to the principles of Sustainable Development which underpins planning and of which a definition is set out in the NPPF, and also in the London Plan

<https://www.london.gov.uk/what-we-do/planning/london-plan/current-london-plan/london-plan-annexes> .

This means that solutions to London's economic, social and environmental challenges must be ones which are win, win, win for all 3 areas – as the government says “We want to achieve our goals of living within environmental limits and a just society, and we will do it by means of a sustainable economy, good governance, and sound science.” <https://www.gov.uk/government/publications/securing-the-future-delivering-uk-sustainable-development-strategy>

Indeed the key challenges facing London are ones which are economic, social and environmental in nature.

Population growth is a key challenge for London in all these 3 respects – including on transport implications. Anticipated population growth should be dealt with sustainably as part of a national strategic strategy, however some inevitable increases in London must be dealt with sustainably from a transport point of view. Population growth will result in potential extra journeys, and so pressure on existing infrastructure and demand for further investment.

Dealt with in the wrong way and this could have negative implications on the economy such as, if traffic was allowed to increase, through worsened congestion. There could also be negative social implications from more traffic including more accidents, worse community severance, and such as health impacts and worse health inequality from the environmental problem of worse air pollution (as the most disadvantaged tend to live near main roads where air pollution is worst worse air pollution exacerbates health inequalities).

However there is an existing problem and challenge of there being too much dirty traffic in London - current and expected worse congestion, and current inequalities including health inequalities are themselves key challenges for London.

Air pollution is an environmental challenge but also an economic and social one. Economically there are costs estimated at up to £20B a year, congestion and air pollution kept London down to 38th place for liveability in a ranking of world cities (<http://www.telegraph.co.uk/expat/expatnews/10648488/Viennas-the-most-liveable-city-but-polluted-London-misses-out.html>), and this would be expected to have impacts on the economy as businesses want an efficient as well as a healthy environment for people to live and work in and to visit. Socially nearly 10,000 Londoners die prematurely a year due to air pollution, with the most vulnerable in society being disproportionately affected – and with the early deaths being just the tip of the iceberg below which there is ill-health.

The NIC will be aware that the UK is failing EU legal limits for the toxic gas Nitrogen Dioxide (NO₂) which were due to be met by 2010, and 2015 at the very latest. It will also be aware that a Supreme Court ruling has meant that the government was required to produce new plans by the end of last year to meet limits now in the shortest time possible, but that these plans have been deemed by those who brought the case to be not adequate (failing as they do to take all possible measures).

The EU Air Quality Directive's requirements are absolute, and that there can be no averaging of improvements and deteriorations across a zone. Not only is there a non-deterioration principle to protect relatively good air under limits, and the requirement that a breach not be caused, but also that air over limits must not be worsened.

It is not adequate to rely for compliance with EU law on whether a scheme would delay compliance for the Zone ie if there would be elsewhere in the zone with worse air, as has been argued by some based on the NN NPS – but following that cannot render the UK in breach of its international obligations such as the EU Ambient Air Quality Directive. This issue was referred to in the McCracken opinion obtained by Clean Air in London:http://cleanair.london/legal/clean-air-in-london-obtains-qc-opinion-on-air-quality-law-including-atheathrow/attachment/cal-322-robert-mccracken-qc-opinion-for-cal_air-quality-directive-and-planning_signed-061015/.

The London Plan requires development to be Air Quality Neutral (as at 7.14c) ie for air pollution not to be worsened. However, given the requirement to meet limits in the shortest time possible AQ Neutral is no longer an adequate criteria at this time. Measures proposed to mitigate the effects of a scheme must be done anyway, but the scheme itself not allowed to add to the problem ie the scheme not pursued. Only then, with all other possible positive measures and avoidance of negative ones, would illegal air pollution be brought within limits in the shortest time possible.

There are particular air pollution challenges with the gap between emissions of NO_x expected due to lab tests not being matched in real world driving emissions. The EU Council of Ministers agreed on 28th October 2015 on standards for EU Real Driving Emissions (RDE). The agreement was reached in order to address the discrepancy in emissions between laboratory tests and NO_x emissions found in real world driving. However the new standards would allow new types of Euro 6 diesel cars to emit more than double the Euro 6 NO_x emissions limit from 2017 to 2020, and 50% more after 2020, thereby de facto increasing the standard of Euro 6 from 80mg/km to 120 mg/km (http://europa.eu/rapid/press-release_IP-15-5945_en.htm). There is also the challenge of the VW and wider scandal to be taken into account.

The need to address the causes of climate change are also a huge challenge for London's infrastructure – on transport (and on which measures to tackle air pollution largely overlap with those to tackle climate), and also in buildings and housing (particularly in retrofitting existing stock, and in new build), and on energy supply infrastructure.

Also the impacts of climate change are another environmental challenge which will lead to huge social and economic challenges too – for instance heatwaves and the need to cool the tube, drought and our water supplies, more intense rainfall and the need to slow water's progress into drains are all huge challenges for London's infrastructure. The Mayor and London Assembly have done considerable work on this.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

The only strategic options are those which deliver on sustainable development in London ie those which help not hinder our ability to live within our environmental limits, and to build a just society ie options which are win, win, win for the economy, society and the environment.

As well as ensuring what vehicles are on our roads are clean, traffic levels must be cut.

No schemes which would add to traffic can be pursued, and only schemes which give people alternatives and help them out of vehicles can be pursued – and this is all the more so the more population is expected to increase.

Road space can and must be restricted and can be re-allocated to help deliver a step change in cycling and walking infrastructure to maximise the potential for these modes, and for public transport to address identified need for longer journeys.

- **How should they be prioritised, taking account of their response to London’s strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?**

The absolute priority is to progress only what will help deliver on environmental issues such as air pollution and climate change, as well as social issues including inequality, at the same time as developing our economy.

The first priority must be to plan to reduce the need for people to have to travel at all unnecessarily – by providing key amenities and work opportunities within easy walking and cycling distance of homes as much as possible. This is particularly important for any regeneration areas and where population or jobs are due to increase. This approach will help reduce pressure on existing infrastructure, and in turn the demand for further investment.

Facilities for safe and easy walking and cycling must be prioritised to maximise the potential for these modes, which are considerable – ahead of pursuing any identified need for new public transport to adequately enable longer journeys.

There is no place for adding to traffic levels – indeed all road users are helped by cutting traffic levels and less traffic helps congestion, resilience and journey times. Vehicle users are in fact helped by less traffic as this frees up existing roadspace for existing and some future new essential vehicle trips.

In East London a package of non-road measures including new non-road river crossings must be developed– the current road-building plans would add to traffic and so to congestion in the wider area (even if queuing at the existing Blackwall tunnel was reduced there would be worse congestion overall and at other places), and the plans would worsen air pollution.

Further infrastructure must not be allowed at City Airport – this is currently seeking a taxiway and new aircraft stands. City airport is a blight on East London with the aircraft noise, air pollution impacts, and the Public Safety Zone (PSZ) blights large areas around the runway itself. There would be multiple benefits from closing the airport (now that Crossrail will allow quick access to Heathrow) and freeing up the land for much needed housing and work and amenity uses

<http://www.neweconomics.org/blog/entry/why-its-time-to-close-london-city-airport>

- **What might their potential impact be on employment, productivity and housing supply in London and the southeast?**

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Crossrail 2 (any more than Crossrail before it) must not be allowed to develop at the cost of other small scale local transport improvements.

Also, if these mega projects are being pursued, it is essential that the benefits of the investment are maximised by investing in complementary transport measures to feed people into and out of the mega scheme eg walking and cycling connections, and also other public transport, so that the benefit reach out to as wide an area as possible.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

London-wide road user charging or pay-as-you-go driving must be seriously looked at for London –the Congestion Charge Zone in central London has been very successful in keeping traffic out, and a scheme is needed to cover the whole of London in order to cut traffic and congestion (and help with air pollution), and this can be a revenue earner to be used to give alternatives to driving.

- **What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?**
- **What innovative funding mechanisms could be considered to support delivery of key schemes?**

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

There are examples of how removing road space from vehicles has been done and been successful. For instance Seoul removed a key highway from its centre:

(<http://www.theguardian.com/environment/2006/nov/01/society.travelsenvironmentalimpact>)

Cities are now increasingly restricting road-space and traffic to tackle air pollution:

<http://www.theguardian.com/cities/2015/dec/09/car-free-city-oslo-helsinki-copenhagen>

(Oslo [revealed plans](#) to ban all private vehicles from the centre by 2019)

ANNEX 1 – Friends of the Earth submission to the London Assembly Regeneration Committee inquiry into Transport-led regeneration, August 2015 (also in the collated submissions for the inquiry <https://www.london.gov.uk/about-us/london-assembly/london-assembly-publications/transport-led-regeneration>)

To:
Regeneration Committee,
London Assembly,
City Hall,
The Queen's Walk,
London SE1 2AA

From:
Jenny Bates, Friends of the Earth
[email and telephone number redacted]

31st August 2015

Re Inquiry: Transport-led regeneration

Thank you for the opportunity to comment on this important issue. We trust that, given that it was until the end of the month that responses to the inquiry were welcomed (see email chain below), you will accept our comments dated 31st August.

We wish to make the following brief comments, with reference to the Thames Gateway road bridge as a case study of ill-conceived transport-led regeneration.

We understand that Campaign for Better Transport will have made a submission referencing a report of theirs.

We wish to follow that up stating that it is our view that it is regeneration led by sustainable transport modes which is clearly the way to develop London sustainably in a way which helps address inequalities and helps us meet our environmental targets, and that road-building-led regeneration is not only counter-productive but also iniquitous.

Focusing on regeneration models which help improving accessibility through reducing the need for people to have to travel, by providing as much as possible, key amenities and work opportunities within easy walking and cycling distances not only enhances quality of life and health, but also takes the pressure off public transport.

Investing in public transport for any identified need to facilitate longer journeys helps all road users. It helps those without access to a vehicle and reliant on public transport, and also helps take the pressure off the road network – the aim should be that the road network should be left for essential vehicle journeys (both existing and potential new ones as a result of population growth).

By contrast investing in road-based regeneration tends to mean fewer people travel by sustainable modes (as people are attracted by driving), which is not only contrary to policy and also deprives people of the health benefits of active travel.

Non-road based regeneration makes much better use of space, enabling higher densities and more land available for housing and work opportunities, or public/open space – as providing space for roads and parking space is wasteful. The main businesses which tend to be attracted to an area when road-based regeneration is pursued would be vehicle-dependent development such as warehousing and distribution which tends to be low-density and low-employment usage.

Indeed, the evidence for road-based regeneration is very weak and potentially counter-productive.

The Greenwich Peninsula site should have been a prime development site, if its position next to the 4-lane

Blackwall road Tunnel was truly beneficial – yet the site lay dormant for a long time until British Gas paid English Partnerships £20m (as I recall) to secure a Jubilee Line Extension station on the site.

Further the proposed Thames Gateway road bridge (TGB) proposed between Greenwich and Newham, on proper scrutiny at a Public Inquiry in 2005-6, showed that the regeneration claims made for the scheme did not stand up.

Further, given the requirement in planning for sustainable development, whereby economic development, the building of a just society and the requirement to live within our environmental limits are required to be delivered together (ie through win, win, win solutions) it is clear that transport investment must be such that helps reduce inequalities (including health inequalities), and help deliver on environmental targets such as on climate change and air pollution – and that the pursuit of economic goals does not add to the problems of meeting either social and environmental goals.

Whereas non-road based regeneration helps deliver sustainable development, road-based regeneration adds to traffic levels (through generated traffic – whether overall or at certain times of day), and so worsens congestion in the area (though the pattern of existing congestion may change), and adds to air pollution.

More traffic and worse congestion and more air pollution blights and is clearly de-generation for local communities. Air pollution is an issue which hits the most vulnerable, and the most deprived the hardest (as they tend to live near the main roads where air pollution is worst) – and so adding to air pollution adds to health inequalities.

But worse traffic, congestion and air pollution is also bad for business and for regeneration – adding to congestion is clearly counter-productive, and air pollution makes an area unattractive for people to live or work or visit.

We wish to draw your attention to a few key links:

Case study: the Thames Gateway road bridge:

This press release and linked briefing refers to various issues raised by the planned TGB – on traffic generation and congestion, on air pollution, and on fewer people walking and cycling and using public transport if the scheme went ahead, and on regeneration.

Friends of the Earth's 2007 briefing from after the end of the TGB inquiry but before it was known the Inspector had recommended rejecting it

http://www.foe.co.uk/resource/press_releases/thames_gateway_road_bridge_06112008

Background briefing at the end of the Public Inquiry:

http://www.foe.co.uk/sites/default/files/downloads/thames_gateway_bridge_07.pdf

On traffic and congestion:

- Induced traffic: Professor Phil Goodwin

<http://stopcityairportmasterplan.tumblr.com/post/19513243412/induced-traffic-again-and-again-and-again>

- Transport expert John Elliott's slides showing when Blackwall tunnel was doubled from 2 to 4 lanes, traffic more than doubled within a year at peak time

<http://stopcityairportmasterplan.tumblr.com/post/20012814230/presentation-slides-arguing-the-case-against-the>

- John Elliott also has made clear that with more roadspace, more traffic would mean overall worse congestion in the area (though the pattern of congestion may change).

If congestion was relieved eg at the Blackwall tunnel/Silvertown Link approach then it would just mean that traffic had got on to another area quicker and making congestion worse there.

- The TGB Inspector's report stated that crossing was "likely to cause increased congestion"

http://www.foe.co.uk/resource/press_releases/thames_gateway_road_bridge_06112008

- A Hyder report which was buried by Greenwich warned of "The likely outcome would be the exhaustion of the Silvertown Link capacity within a relatively short timeframe with exacerbated congestion on the local road network." and "This could only be mitigated by a new high quality public transport link, such as a DLR extension."
<http://853blog.com/2014/05/06/buried-greenwich-council-report-criticises-silvertown-tunnel/>

Road building and air pollution:

- For example the TGB would have resulted in worse air pollution (see above)
- Kings college London did a study of widening the A206 (which was a key link to make a route all the way from the TGB to the M25 dual)

<http://www.sciencedirect.com/science/article/pii/S0048969714010900>

This showed:

- Local air quality deteriorated after completion of a road widening scheme in south London.
- The EU PM10 limit value (LV) was breached during construction.
- NO2 LV was breached after scheme due to increased cars, taxis and LGVs

Despite this evidence, TfL have continued to pursue new road-building and argued that it would help regeneration.

What they have not done is look at a proper package of non-road alternatives, which would include multiple non-road investments as well as road-pricing etc as required.

GB Railfreight – Response to the National Infrastructure Commission

London Transport Infrastructure Review

Q. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

Rail freight plays a vital role in bringing aggregates and other construction materials to London for major civil engineering and construction projects, as well as removing waste in the form of spoil. For Crossrail, GB Railfreight has transported over 1 million tonnes of excavated material from the tunnels to a new nature reserve at Wallasea Island in Essex.

In order to sustain growth across these markets, and continue supporting UK manufacturing and construction, it is vital that London possesses strategically effective rail connectivity and freight facilities. As such, we are going to detail areas that we believe need to be considered in the National Infrastructure Commission's Review.

a. Inland rail freight terminals

i. Aggregates terminals

In the Greater London Authority's Local Aggregate Assessment for London 2013, it was concluded that, with two years left to run on the Capital's landbank of permitted aggregate reserves, rail heads would be crucial in sustaining high levels of imports into London.

GB Railfreight supports the development of existing and new strategically effective aggregates terminals across London, which are truly open access for the rail freight industry, in order to deal with actual and prospective growing demand.

The key to adjusting to demand and not wasting spend on the wrong developments is focusing on sites that have economies to support them, as well as incorporating aggregates needs in plans for station rebuilds and enhancements (e.g. Euston station), and major programmes such as HS2.

Despite being intermodal terminals, both Stratford and Willesden freight terminals are prime examples of speculative builds subsequently closed, that suffered significant losses because, along with delay risks and road congestion costs, they had a limited market to drive business.

On the other hand, if we assess Hanson UK's Kings Cross Concrete facility, it has been able to grow into the second largest concrete site in the UK as a result of its strategic location. This growth has been supported by infrastructure at the facility, which allows it to accept large trains and offer significant storage space, as well as high levels of operational competitiveness.

It is also important to note that central and local government's commitment to selling off public land reduces scope for potential aggregates sites in London and, as a result, the Chancellor's 160,000 homes target.

GB Railfreight recommends that an evaluation is made of the markets across the Capital that require support, or further support, from an aggregates rail freight terminal.

ii. Cricklewood

Cricklewood represents the last location in London that is ideally connected for both road and rail freight. Companies operating there primarily carry out spoil and refuse haulage. In September last year, GBRf ran its first train for FCC Environment, transporting waste from its new North London Railfreight Terminal in Cricklewood to Buckinghamshire.

As the Capital continues to build, and major projects and programmes such as Crossrail and HS2 progress, more and more construction soils and materials need to be able to leave the capital efficiently and with the least cost to the environment. This comes at a time when London's roads are already seriously under strain. Cricklewood will, therefore, be crucial in helping remove lorries from London's roads.

The planned Brent Cross Thameslink railway station, as part of the Brent Cross Cricklewood development, will see various freight sites being moved from one side of the Midland Main Line to the other. Our concern is that could lead to the reduction in available land for freight, so we would like to see various sites safeguarded for freight prior to the move.

GB Railfreight recommends that freight sites at Cricklewood are safeguarded.
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b. Freight route investment

In order to support proposals around inland freight terminals and freight capacity in London, we need to address the problems of bottlenecks on key lines in and out of the Capital. These bottlenecks often occur on sections of two-track with flat junctions, such as on the North London Line, West London Line and South London Line.

The North London Line provides a nationally important and electrified freight route from the UK's largest ports, at Felixstowe and London Gateway. In order to cater for the planned growth of freight and passengers, and to do so robustly over the next 20-25 years, the North London Line needs additional signalling throughout and a new regulating point near Gospel Oak or Kensal Rise. Reduced planning headways (with additional signalling) are also needed between Gospel Oak and Barking.

Further capacity problems exist on the Midland Main Line north of St Pancras, which has been designated as congested infrastructure by Network Rail. The Line cannot cater for current demand, let alone future passenger and freight growth. As such, timetabling is crucial to limit delay. However, with the second stage of Thameslink opening in 2019, this will become even more difficult.

The investments made by the Strategic Freight Network fund, and work carried out by Network Rail to incentivise passenger growth, have increased the separation of freight and passenger services. Following West Anglia Route Modernisation and enhancements to the Great Northern Great Eastern line, there will be the potential to run freight and passenger operations from London to Doncaster in almost total separation. More opportunities to separate the traffics brings benefits to both modes of freight and passenger, whilst crucially retaining the ability to use both routes for contingency and maintenance provision.

GB Railfreight recommends that opportunities are evaluated for improving infrastructure capacity on the North London Line, South London Line and Midland Main Line.

National Infrastructure Commission
Response the call for evidence on London
Gravesham Borough Council Response

Introduction

Gravesham Borough is located in Kent south of the river Thames, east of the Dartford Crossing and has a population of 105,300. The main Gravesend/Northfleet urban area has a population of 84,400. The rest of the Borough is covered by Green Belt, though within that there are significant areas of Ramsar/Special Protection Area (North Kent Marshes) and parts of the North Downs Area of Outstanding Natural Beauty.

On the west side of the Borough north of the A2 is the Ebbsfleet Valley, shared with Dartford Borough Council, and now covered by the Ebbsfleet Development Corporation. The two Boroughs' remain the plan making authorities. Considerable development has been proposed and consented in the Ebbsfleet area, and is now starting to happen on the ground. The EDC is charged with accelerating and developing the vision for the 'Garden City'.

The Borough is crossed west-east by the A2 trunk road (4 lanes plus hard shoulders) connecting London and the M25 with North Kent and Dover. The M20, just to the south of the Borough, is the main route to the Channel Tunnel and ferry's. Both connect to the M25 which provides links round London and to the rest of the country.

There are three railway lines across the Borough, all running roughly east - west. The North Kent Line links London Charing Cross & Cannon Street with Medway Towns via Dartford & Gravesend. HS1 links London St Pancras with the Channel Tunnel with an international and domestic station in the Ebbsfleet. Domestic Services operate over HS1 from East Kent via Ashford and via Gravesend. Finally there is the Chatham line running through the rural area linking London Victoria with the Medway Towns and East Kent (east of Medway this is confusingly also referred to as the North Kent line). Travel times currently to central London are in the order of 60 minutes from Gravesend by the traditional routes and 24 minutes on HS1.

27% of the working population are employed in Greater London and commute by coach, rail & drive, and only 33% work within the Borough. 18% of journeys to work are by public transport and 65% are by car.

The Borough therefore qualifies as part of the 'London commuter hinterland' and there is a tension between a role (at one extreme) of being a pure commuter settlement and providing more employment in the Borough to produce more sustainable travel patterns.

The north of the Borough is part of Thames Gateway with significant redevelopment opportunities on former industrial land. Land values, compared with London, are relatively low so there are viability issues.

Question 1 Economic and Social challenges

Gravesham has an adopted Local Plan Core Strategy to 2028¹. Work for Kent County Council extrapolates this to 2031². The Council has commissioned technical work for the Local Plan including a SHENA (Strategic Housing and Economic Needs Assessment) which will update the objectively assessed housing need, employment and retail requirements and

¹ Gravesham Local Plan Core Strategy <http://www.gravesham.gov.uk/services/environment-and-planning/planning/planning-policy/gravesham-local-plan-core-strategy>

² KCC Infrastructure plan <http://www.kent.gov.uk/about-the-council/strategies-and-policies/environment-waste-and-planning-policies/growth-and-infrastructure-framework-gif>

look further into the future. This includes analysis of development land values and site viability. This study will be subject to consultation in the spring, but is likely to show, in line with the national household projections, higher levels of housing need. As a rule of thumb the latest national household projections suggest something in the order of a 25% increase in annual housing completions for Kent as a whole over and above levels set out in the South East Plan (as an arbitrary benchmark). This represents a major transport challenge for an already stretched transport infrastructure across the South East.

The Borough has a finite supply of brownfield sites, and once these are developed it will be necessary to hold discussions within the sub-region about the scale and location of development. This will include the role of the Metropolitan Green Belt and its boundaries. As noted above there are nature conservation and landscape constraints in the rural area. The Borough is the least self-contained in employment terms in Kent and there is an objective to increase local employment for sustainability reasons.

A major component of new development is in the Ebbsfleet area around the International and Domestic Station, shared with Dartford Borough. The overall strategy stems from the mid 1990's and the arrival of HS1, and required a significant modal shift. Planning permissions exist for the most of the overall area. The Ebbsfleet Development Corporation (EDC)³ is now taking this area forward and has commissioned a masterplan. It has £310 m to assist with infrastructure delivery over the next 5 years.

London Resort Company Holdings (LRCH) is proposing a leisure resort on Swanscombe Peninsula mainly in Dartford Borough, which is aimed at attracting 15m visitor a year and directly employing some 13,000.⁴ LRCH are continuing to develop their proposals and assess the impacts, but they are of major significance in creating demand for travel by both workers (13,000 jobs directly) and visitors (up to 96,000 per day at peak). It is currently intended to progress the development via an application under the NSIP process.

The EDC masterplan will deal with both a 'with and without' London Paramount world. Various sites have recently been granted Enterprise Zone status in the Ebbsfleet and at Northfleet Embankment. The new development needs to be grafted and integrated with the existing communities, complicated physically by the changes in levels brought about by the chalk quarrying of the past.

It has been known since the original work on Kent Thameside in the mid 1990's that given the local road infrastructure (and reasonable enhancements thereto) that a major shift to public transport was required to cope with travel demand along with additional local jobs. The HS1 station at Ebbsfleet was a key part of the strategy along with the Fastrack system. The later along with local bus routes, walking and cycling networks is the foundation on which rail sits.

The intention was to create a substantial amount of local employment to attract employees, especially from further east, and increase local self-containment. In Gravesham the housing market already includes a component of movement out of London and on further east, so commuting will remain a significant element.

A2 is highly congested and proposals are being developed junction enhancements to support development at Bean and Ebbsfleet. Proposals exist for additional crossing capacity either at the existing Dartford Crossing or east of Gravesend. A fresh consultation is about to occur on this contentious issue. The Borough Council opposes routes east of Gravesend on environmental grounds.

Both residents and businesses see transport as a key issue, as witnessed by reposes to recent consultations by EDC and LRCH. There is scepticism over the ability of the transport

³ Ebbsfleet Development Corporation <http://www.ebbsfleetdc.org.uk/masterplanning/>

⁴ LRCH <http://www.londonparamount.info/have-your-say/project-documents/>

system to handle new development and concern over the reliability of the system, especially by business.

Thus there are major transport issues locally, never mind the outworking of some of the considerations outlined for example in the London Infrastructure Plan 2050⁵.

It is important that a focus on major infrastructure projects does not exclude considerations of ease of use – covering such matters as information, paying tolls and fares. Progress is being made, slowly, on integrated ticketing for public transport but a similar approach is needed elsewhere. For example will it be possible to have one account to handle all Thames tolled river crossings?

The bus networks should not be overlooked – as there is a fundamental disjunction between method of organising bus services inside and outside London. In the former it is essentially specified by TfL whereas outside it is based on competition – which had de facto produced local monopolies. TfL services reach as far as Bluewater.

There is therefore a major challenge from growth to handle the demand for movement across the South East.

Q2 Strategic Options

The answer to this question has been addressed by mode to illustrate the complexity of the issues. The fundamental point is that this is a regional issue (meaning the wider Southeast), especially in relation to the rail network, not just a London one. There is finite rail capacity which is trying to meet the growing needs of passengers, both inside and outside London. The same is true of the strategic highway network which at peak times, and in some locations all day, highly congested. There is a big question, especially outside London, where on the Commissions timescale substantial new development is going to occur.

There is a tension between what might be called a London view of the world – seeing the inner South East as a source of housing for jobs in London – and a view seeking more local jobs and meeting local housing needs. In the local context this is exemplified by the counter weight that London Paramount would offer in terms of jobs.

The Commission is not in a position to determine future development patterns: it can only work on existing commitments and some future options. Major development outside London logically requires routes that support it which will suggest which corridors should benefit from, for example, Crossrail 2 or Crossrail 1 extensions but also possibly links that do not focus on London.

In arriving at changes to the network there is a danger in trying to fit a scheme to services, rather than specifying what services are needed (as a consequence of the future demand or existing congestion) and then providing the infrastructure that serves that. Many of the quick wins have been already made and future will require more Crossrail like schemes (e.g. Crossrail 3 from South East London) on the basis that terminal platform capacity is hard to expand.

Q2 Strategic Options: Road network

The A2 past Gravesend was widened in 2008 to 4 lanes, and moved slightly south. At peak times it is running at over capacity and a number of the junctions have started to show stress. The A2 is an important part of the local road network as well as its strategic role, for example past the Ebbsfleet only it and A226 (single carriageway road on a chalk spine) provide east – west links.

⁵ London 2050 <https://www.london.gov.uk/what-we-do/business-and-economy/better-infrastructure/london-infrastructure-plan-2050>

The current Dartford Crossing is severely congested and the Government has accepted the need for additional crossing capacity. A consultation is imminent on the options that have been recently refined either at the existing crossing (corridor A) or east of Gravesend (corridor C). Gravesham opposes corridor C because of the environmental impact. The debate about route choice will take place elsewhere but the need for additional crossing capacity (along with proposals inside London) is obvious. Once a route corridor is selected delivery of this scheme should occur within the current timeframe of 2025.

Highways England is committed to enhancing the A2 junctions at Bean and Ebbsfleet junctions to deal with existing problems (Bluewater) and development. London Paramount is working on a junction enhancement at Ebbsfleet to serve both their proposal and the already consented development. Various developments are committed to contributing to such schemes. This however ignores the cumulative implications on other junctions of development across the Gravesend/Northfleet urban area. Tollgate junction (A227) is already stressed. Lower Thames Crossing will make a difference depending on the option chosen, and it is not currently clear what the net effects will be.

The role of Fastrack has already been mentioned but both it and local bus services need to offer frequent, fast and reliable services. Depending on local circumstances this may involve dedicated routes, bus lanes on existing roads and measure likes priority at traffic signals.

On the highway network there is a tension between long distance strategic flows (cross channel traffic for example) and local commute. Highways England is charged with improving the strategic network and Transport Authorities (Kent CC in this case but Medway is also relevant) the local. Private developers are expected to fund improvements for their developments, for example London Paramount as noted above is looking to build a new access road and improve the Ebbsfleet junction.

Local Planning Authorities are trying to meet their housing and employment needs in a context where there is no overview of what the region, including London, needs to meet or the national transport infrastructure needed to support it. There must come a point when the transport infrastructure cannot handle additional development where the relationship between homes and jobs is critical.

Q2 Rail network

Rail network has already been described above. 12 car schemes and power supply enhancements have or are being implemented – the current short term need is for Southeastern or successor(s) to have sufficient rolling stock to run more 12 car trains. There is a particular need for additional high speed rolling stock as peak hour trains are regularly full and standing from/to Gravesend.

Safeguarding exists for Crossrail 1 to be extended out to Gravesend (passenger services) and to Hoo junction for stabling sidings. A study is currently underway looking at the case for extension and what infrastructure would be needed. This is related to the levels of development in Kent Thameside and proposals currently being explored along the riverside in the London Borough of Bexley.

A further complication is the “with and without” London Paramount cases. The later would certainly significantly enhance the need for services east and west from Swanscombe/ Northfleet to get labour to/from the development. The Borough Council would support the extension of Crossrail to help meet the need for additional capacity on the North Kent line, given the constraints further into London. There is an obvious logic in diverting as many passengers as possible (for whom it is an appropriate route choice) onto HS1 from Ebbsfleet, Gravesend and Medway. Crossrail could then do the same at Abbey Wood leaving the rest of the traffic on the traditional lines where expanded services provision should be possible. What is required needs to be explored further.

Transport for London and others have expressed a desire (with or without taking over the franchising role and making it a concession) for regular interval services on the various routes from Dartford into London. The precise nature of these proposals is unclear both in terms of service pattern, termini, infrastructure and rolling stock implications etc. The point of all this is to illustrate that the issue is not a simple one of infrastructure and requires the balancing of a number of factors. On rail issues at least there overall balance needs to be looked at in the context of transport for the south east – not just London.

Q2 River

Currently Gravesend is linked to Tilbury by a regular ferry service, subsidised by Kent County Council and Thurrock Council. The Borough Council has invested in a pontoon off the historic Town Pier to increase the potential usage. London Paramount has discussed services from central London to serve their development (and use of the river in the construction phase) and also provide access for labour from Thurrock. The potential of the Thames should not be overlooked as a transport corridor for both passengers and freight, where for example London Paramount has identified considerable scope in the construction phase.

Q3 Crossrail 2

No direct comment on this scheme other to note the on-going tension between an all stations inner suburban service and aspirations for it to serve destinations further away which implies a different sort of rolling stock and a lack of segregation, as illustrated by Thameslink.

Q4 Funding

Any schemes for new infrastructure will require funding and the Commission will no doubt be presented with a list of projects with a combined large price tag. Traditionally major strategic schemes, whatever the mode, have been funded by Government, whether directly or indirectly. The private sector has played a role (e.g. Dartford Crossing) where tolls can be collected and a funding model constructed. The Local Government funding model is in a period of austerity and it cannot be assumed to produce any greater financial input than hitherto.

Developers are often seen as a source of funding. Major schemes certainly require major transport investment – but this is likely to be for local transport requirements and not able to meet major strategic needs on a significant scale. The Crossrail/Lower Thames Crossing type schemes with costs in the billions will still require significant subsidy. Land values in the Gravesham urban area are only able to support local transport and social facilities to make the area function. The GLA CIL approach to Crossrail funding would for that reason be unlikely to produce significant income on current land market values.

Q5 Lessons for London

This question is interpreted as applying to London and its 'commuter hinterland'. The key points are:

- Transport is a South East issue not just a London one
- There needs to be a strategic regional view
- There are major issues with capacity across a number of modes

- Need to define the 'services' needed (what that means varies by mode) to meet the demand and then define projects that produce the required outputs
- Whatever happens the resulting plan will be a compromise between a host of factors
- There needs to be cognisance of how the system operates as whole (so ticketing, paying tolls etc. is part of the whole from the user perspective)
- Obvious anomalies (e.g. TfL rail concession model versus franchising, differences in the operation of bus networks) in legal framework across boundaries that hinder integration
- Gravesham is particularly interested in:
 - Lower Thames Crossing
 - A2 junctions
 - Full use of existing rail infrastructure
 - Extension of Crossrail 1
 - Development of interchange, bus, walking, and ticketing initiatives to make the overall system work
- Development in lower value areas won't pay for the big ticket items because of scale of costs involved

8 December 2016

MAYOR OF LONDON

Lord Adonis

Interim Chair
National Infrastructure Commission (NIC)
1 Horse Guards Road
London SW1A 2HQ

Date: 15 JAN 2016

Dear Andrew

Response to the NIC's call for evidence

Please find enclosed the Greater London Authority's (GLA's) and Transport for London's (TfL's) joint response to your call for evidence on large-scale transport infrastructure improvements in London. I also comment in Appendix 1 on your study on improving the balance between electricity demand and supply and in Appendix 2 on London's wider infrastructure requirements, which I hope will provide some context and stimulus for the Commission's future work.

Context

Investment in infrastructure is more vital than ever to sustain London's projected economic and population growth, given that the city recently surpassed its previous population peak of 8.6 million set in 1939.

The capital's economy is vital for the rest of the country and is an extraordinary national asset - one of only a handful of truly global cities on the planet. In preparation for this new era of growth, in 2014 I consulted widely on an infrastructure plan for the capital, setting out where growth is likely to come, the long term infrastructure requirements for the capital to 2050, how much they might cost, how we might pay for them, how the plan can adapt to technological change, and how infrastructure delivery should be better coordinated. Appendix 2 provides more background.

Crossrail 2 – the right scheme for London

With regard to new large scale transport infrastructure, my top priority and my first request for government funding is Crossrail 2. I am delighted that the NIC as an independent body can look afresh at this scheme. I am convinced that once the detailed analysis that already exists on this and other potential options is examined, the Commissioners will confirm their support for it.

It is the right scheme for London and the South East because of its unique combination of benefits, amongst which it will simultaneously:

- relieve a series of transport bottlenecks that exist on a network upon which central London's economy depends;
- provide new connections between areas of significant housing potential across the south east and London's main employment centres, thus boosting housing supply to support employment growth;
- support some of the most deprived parts of London.

MAYOR OF LONDON

Critically, it has overwhelming public support, which also means that it can be implemented with relatively little controversy or opposition. It has for many years had its route safeguarded; all other potential schemes would require years of development to get them to an equivalent stage. As part of its development, many alternatives have been considered, including enhancements to the existing rail network and smaller rail schemes. It is clear that no feasible alternative schemes, either individually or cumulatively, could generate the combination of capacity and connectivity benefits that together offer the transformative impact on economic performance that Crossrail 2 is expected to bring about.

Consequently, Crossrail 2 is my considered priority and that of TfL's Board. As you know, it also commands the support of London's business community.

I am now ready to proceed to the next stage of this project's development for which I need the Government's full support. We cannot relive the experience of Crossrail 1, which was conceived in the 1940s, took shape in the 1970s and 1980s, was (unjustly) rejected by Parliament in the 1990s, resurrected by my predecessor and me in the 2000s and will at last open in 2019, nearly 80 years after being first mooted. I am sure that you will want to help us all do far better for Crossrail 2. It is important that we do not keep going back to square one when there is a viable and popular scheme on the table. I have a brilliant team in place to deliver it. To put it another way, from now on, every six months delay by the Government will result in up to £4b in lost benefit including thousands of homes that could be built at or near a Crossrail 2 station.

Funding

There is no doubt that Crossrail 2 will be expensive, but I believe it is eminently affordable. During construction, its costs will be a small fraction of the regional economy that it will serve for decades, if not centuries, to come. We estimate it could deliver an economic boost of up to £7.9b per annum. Its construction will create 60,000 jobs and it will provide opportunities throughout the national supply chain, as has been the case for other major projects in London, including Crossrail 1 and the preparation for the Olympic Games.

Crossrail 2 should be funded ultimately by those who will benefit from it most, including those whose property values will increase as a result of the decision to build. We have time to develop a set of policies to capture a proportion of this value uplift to pay for the scheme, but we need to make good progress soon. I would also expect contributions from those outside the capital who will benefit from it.

Insofar as we remain a highly centralised state, fiscally, then we will continue to rely on government grant to fund it. Economically that would be rational given Crossrail 2's boost to a regional economy whose taxes go largely to the national exchequer. However, I have argued consistently for the devolution of fiscal powers to enable us to pay for much more of it (and other schemes) ourselves. Such powers could include a variety of taxes and similar instruments highlighted in the submission. The political acceptability and economic appropriateness of these can and should be assessed in more detail during the development phase. What is not acceptable is neither grant nor the powers to pay for the scheme ourselves, if the strength of the rest of the business case is accepted.

MAYOR OF LONDON

Development funding

I am asking the NIC to recommend that the Government take the necessary steps to enable a Hybrid Bill to be submitted before the end of this Parliament. This requires an application for statutory powers in the coming years which would allow the delivery phase to commence in 2020 and the scheme to open by 2030. The sponsorship and consent costs associated with this are £250m and we are seeking the NIC's support for funding from the Transport Development Fund for a significant proportion of this. If insufficient funding is made available for these activities there is a risk of setting the project back by at least half a decade, which could constrain London's growth.

Key considerations for determining the appropriate allocation of national resources for major new 'national' infrastructure are set out below. These are intended to assist the NIC in making its recommendations to the Government on prioritising national resources for large scale transport infrastructure - and more immediately those required for planning and developing them:

- the scope for unlocking genuine economic potential through intensifying or transforming the way land is used, as expressed through economic performance measures such as GVA, and the extent to which this is additional at the national level;
- the key constraints that prevent people and places from realising their economic potential, including both transport bottlenecks and shortages of housing;
- the wider impacts including the sustainability implications of alternative strategic choices;
- the 'economic payback' of large scale infrastructure investment and the implications for national level funding through the impacts on fiscal receipts associated with the economic performance benefits;
- the opportunities for regional and local funding from development that is unlocked and other sources;
- the pressing nature of the strategic challenges and the timescale for addressing them, in particular the threats to continued growth arising from constrained transport capacity and inadequate connectivity as population pressure increases.

Conclusion

Overall I believe that once Crossrail 2's benefits are viewed holistically, its top ranking priority becomes clear. It will underpin new urban areas, support our nationally critical employment centres, boost the supply of homes, provide a large number of jobs, support a national supply chain, deal with major transport bottlenecks, give a lift to areas of national disadvantage, and reinforce a transport network that underpins the country's most productive region. It thus already commands widespread support. It is now time to get behind it with proper funding so we can build it in the 2020s.

I am confident that your Commission will support Crossrail 2. My team and I look forward to our continuing discussions and we will try to supply whatever further detail you may require.

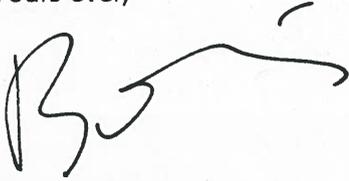
Other projects

For the avoidance of doubt, my only call on the NIC's Transport Development Fund is for Crossrail 2. More broadly, I also support a submission by the Chair of the West Anglia Taskforce on 4-tracking of the West Anglia Main Line, setting out its potential as a prerequisite to, and to bring forward the benefits of, Crossrail 2 (as set out in paragraph 32 in this submission); and a separate submission being made by a number of parties including the London Borough of Bexley on the

MAYOR OF LONDON

case for extending Crossrail 1 eastwards, which could enable substantial growth in the south eastern corridor from London towards Ebbsfleet and Gravesend. These and other schemes, such as the Bakerloo line extension and A13 Riverside tunnel that we are developing, are important parts of the necessary pipeline of transport investment described in paragraphs 34-40 of the submission, but for which we are not seeking funding (at least at this stage) from the Transport Development Fund.

Yours ever,

A handwritten signature in black ink, appearing to be 'Boris Johnson', written in a cursive style.

Boris Johnson
Mayor of London

Encs.

LONDON'S LARGE SCALE TRANSPORT INFRASTRUCTURE REQUIREMENTS

**GLA / TfL Submission to National Infrastructure
Commission**

January 2016

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1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

1. Since the advent of the modern Mayorality in 2000, London has benefitted from its ability to undertake integrated strategic planning. There is a suite of statutory and non statutory documents that draw on a common evidence base developed and tested by the GLA and its functional bodies (including TfL):
 - The London Plan¹ and Mayor's Transport Strategy (MTS)² in particular set out a clear strategic policy framework for planning London's growth over the next 20 years.
 - In 2014, the Mayor also published a London Infrastructure Plan for 2050 that looked beyond this horizon.³ This reflects some of the emerging challenges that have become clearer since the publication of the MTS in 2010, including stronger population and employment growth than previously anticipated and the scale of London's housing supply shortage, which were described in the Crossrail 2 Strategic Outline Business Case (SOBC). These are expected to be addressed in an updated MTS following the 2016 Mayoral election, in the context of the new Mayor's overall priorities.

Summary of key challenges

There will continue to be a critical national role for London in driving sustainable economic growth

2. The UK will be competing in an ever more globalised world in which large cities will play an increasingly important role as the economic dynamos⁴. London is at the heart of a network of world cities that have led this process and the UK benefits greatly from hosting one of these global centres. An important economic challenge facing London over the next few decades is to maintain and extend this role.
3. London hosts a major cluster of globally competitive sectors in and around its centre which benefit from large economies of agglomeration⁵ and this represents a source of UK comparative advantage in the world economy. The relationship between employment density and productivity in the 100 largest employment centres is illustrated in Figure 1. The evidence for economic mass and productivity effects is set out in the DfT's Transport Investment and Economic Performance report⁶.
4. Ready access to a very large population catchment as illustrated in Figure 2, is fundamental to London's ability to act as a global employment centre. This depends critically on the transport

¹ <https://www.london.gov.uk/what-we-do/planning/london-plan/current-london-plan>

² <https://www.london.gov.uk/what-we-do/transport/our-vision-transport/mayors-transport-strategy>

³ The Transport Supporting Paper in particular considered London's economic and social challenges:

https://www.london.gov.uk/sites/default/files/Transport%20Supporting%20Paper_3.pdf

⁴ McKinsey (June 2012), Urban world: cities and the rise of the consuming class

⁵ A number of locations make up London's global employment core (the West End, City, Isle of Dogs; Stratford is emerging as a further centre and may be joined by Old Oak Common). All are dependent on a shared set of network benefits generated by the radial transport system focussed on central London.

⁶ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/386126/TIEP_Report.pdf.

See Chapter 3, pp30 – 41.

network serving London and the wider south east⁷, which remains one of the densest and most comprehensive in the world, and which consequently represents a national asset of immense value.

Figure 1: The relationship between employment density and productivity in the 100 largest employment centres

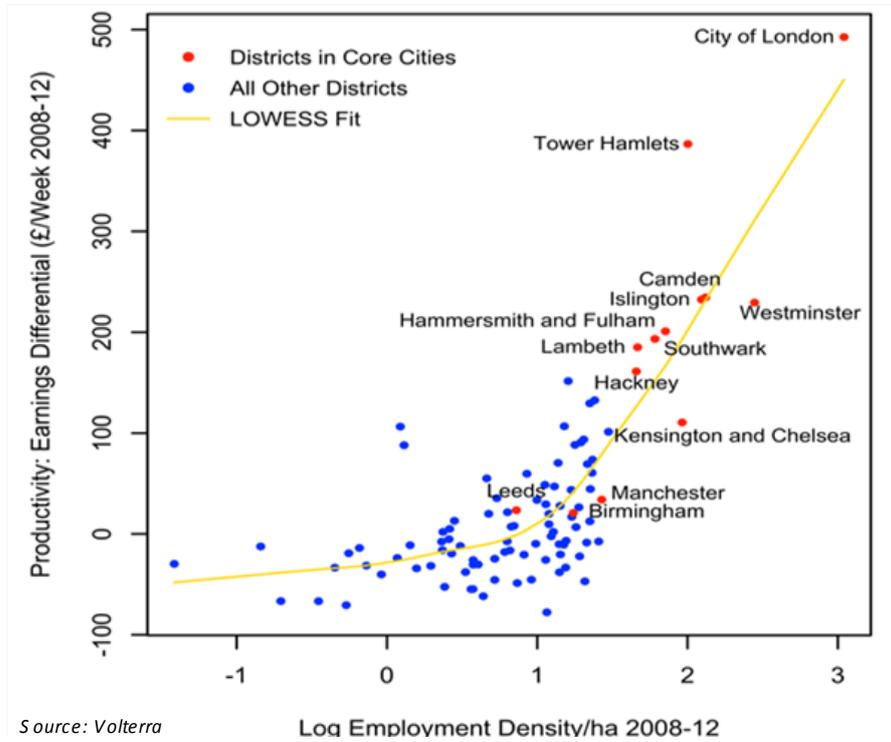
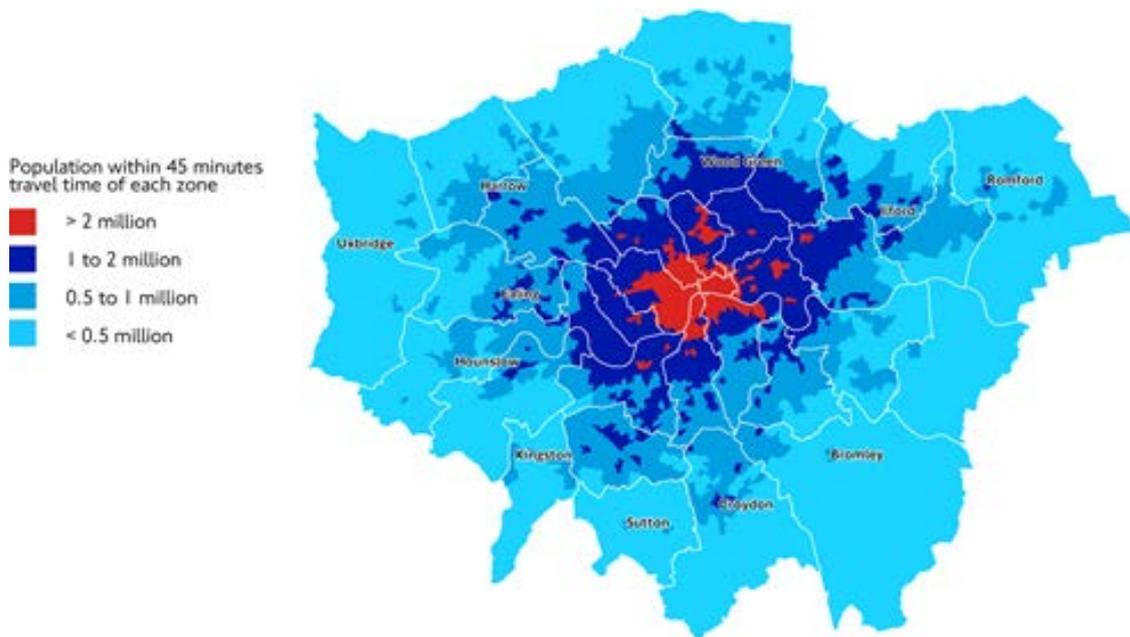


Figure 2: Accessibility: total population within 45 minutes' travel time



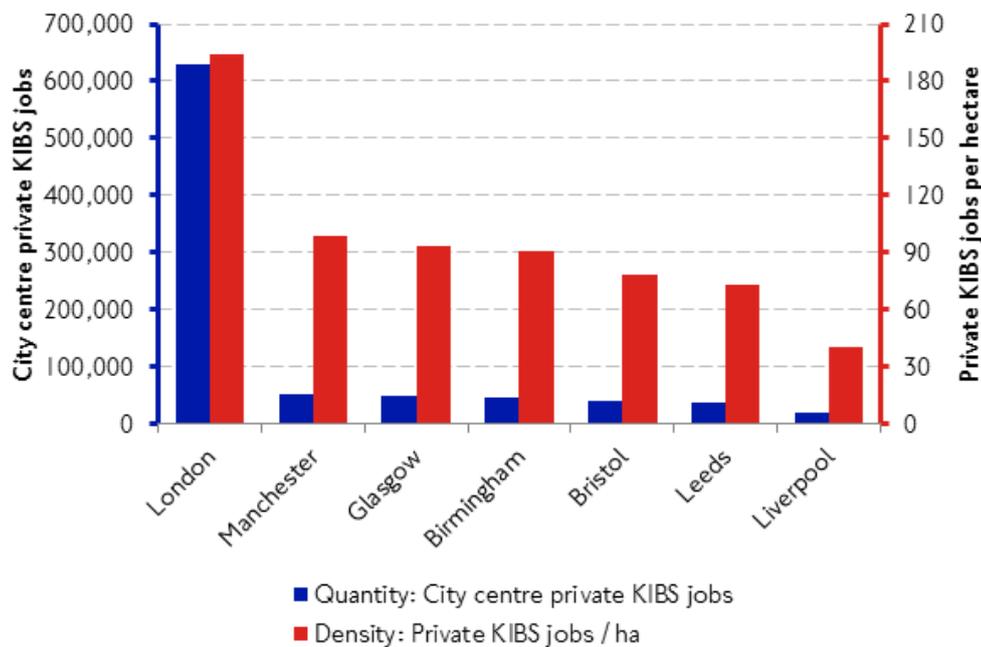
⁷ Around 1 million London workers live outside the city.

- There is in fact considerable scope to further increase employment density in London’s global employment core and to unlock substantial additional economic potential. Doing so will depend on further expanding the labour supply on which the area can draw.

The economic potential cannot be unlocked through any feasible alternative means, eg through ‘decentralising’ employment growth across different parts of London or other UK city centres

- London’s employment core hosts around 12 times the volume of Knowledge Intensive Business Services (KIBS) activity that each of the next three strongest centres host, at around twice the density, as shown in Figure 3. It is clear from this that to replicate in other UK cities the conditions that support London’s global role would require investment on a vast and likely unaffordable scale.

Figure 3: The volume and density of knowledge intensive business services jobs within seven UK city centres⁸



- While there is a strong case for making the UK’s other major city centres more internationally competitive by growing them, it is vital that this is seen as complementary to efforts to build on London’s existing strength rather than as an alternative to it. If London loses its competitiveness in the global markets in which it competes, overseas cities that can compete for these markets, rather than other UK cities, will attract much of the activity that is displaced. In this scenario the whole UK will lose out, including other cities which benefit from the interrelationships with London as a global hub. It is worth noting that cities such as Paris have plans for massive investment in new public transport to boost their competitiveness.⁹

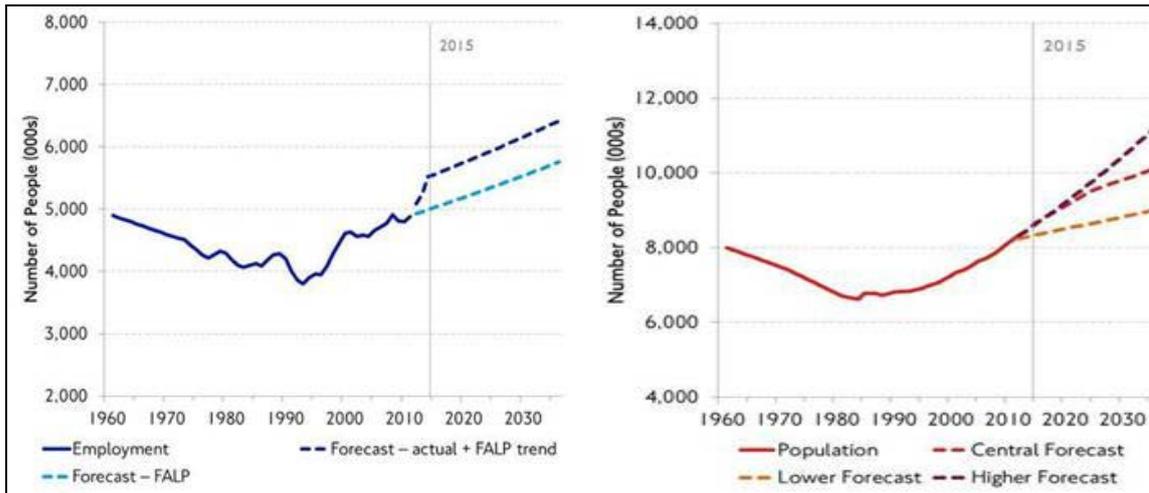
Growth in London’s employment core will drive population in the wider city and region, in turn sustaining employment growth in other parts of London and far beyond

⁸ Based on data from “Investing in City Regions,” Volterra, November 2014.

⁹ €40 billion of investment is committed to public transport to support the “Greater Paris” project.

8. London’s population is forecast to increase from 8.6m million to over 10m by 2036 while employment is projected to grow by 700,000 to 6.3 million, with recent forecasts suggesting even higher growth is possible. This depends however on supportive policies to expand the effective labour supply available in London’s key employment locations. Without these the likely outcome, based on historical trends, illustrated in Figure 4, is not stability but a failing economy and decline, with serious implications for the wider national economy. In particular there is a need to tackle the major threats that transport and housing supply constraints represent.

Figure 4: Historic trends and projected growth in London’s employment and population to 2036



9. London’s economic growth is fundamentally dependent on rail and tube capacity and connectivity – eight in ten arrivals in the morning peak are by rail (including the Underground and Docklands Light Railway). Despite committed investment, the scale of growth in travel demand is such that between 2011 and 2041, crowding is forecast to increase by 60% on the Underground and 150% on rail services¹⁰. Some of the greatest pressures on TfL and national rail services are on a north east / south west axis, which is benefiting relatively little from the current or planned investment. Whilst the current focus is on east-west (Crossrail) and north-south (Thameslink), the north east – south west axis has been acknowledged as needing additional capacity for many years.
10. The pressures are already being felt, with 8 out of the 10 busiest days in the history of the Underground being in October and November 2015. There are also enormous growth challenges on the national rail network. For example, the South West main line into Waterloo, the busiest section of the network, requires approximately 20% additional capacity to deal with existing overcrowding even before anticipated demand growth of 40% to 2043. This represents a key economic challenge since it has major implications for London’s labour supply. For example:
- it threatens to reduce people’s willingness to participate in London’s labour market;
 - access to the network is constrained at times, ie station closures owing to crowding;
 - other productive trips are crowded out;

¹⁰ There has been a shift from car to public transport over the last 15 years of around 11 per cent.

- there has already been substantial ‘peak spreading’, and further opportunities for retiming trips are limited.

To ensure London has an adequate supply of labour in the future housing supply constraints must be tackled

11. The London Plan identifies a need for 49,000 new homes per year,¹¹ while delivery has been around half this rate over the last 10 years or so. The resulting poor affordability of housing reduces the quality of life the city offers its labour force, which has damaging consequences for its international competitiveness:
 - business leaders rate the cost of housing as the second most important obstacle to improving London’s competitiveness;¹²
 - the functioning of the city depends on the availability of a variety of workers including those on lower pay;
 - the inequitable nature of access to London’s housing market is starting to damage its reputation as a city of opportunity and will affect the ability of London firms to recruit and expand.
 - there are also indirect economic impacts through impacts on disposable incomes.¹³
12. Capacity has been identified within London for 423,000 homes over 10 years,¹⁴ and the 2015 London Plan has put in place new policies to support additional supply through higher density development, linked directly to public transport accessibility. Assuming the backlog has already been made up, capacity (not yet identified) is expected to be needed for a further 500,000 homes in the decade from 2025. The London Plan identified key Opportunity Areas (including the Upper Lea Valley) and Areas for Intensification.

Despite its overall economic strength, there remains widespread and persistent social deprivation together with serious economic underperformance resulting from it

13. Tackling the inequalities in life chances that exist in London, by becoming a city of genuine economic and social opportunity for all, will not only be valuable in itself but will improve the quality of life of the city as a whole and strengthen its competitiveness. London’s complex and diverse economy depends on its ability to attract a wide range of workers at different income levels. It is worth noting that almost a quarter of London’s workforce earns less than the London Living Wage. Meanwhile, lower income workers are moving further out, leading to a ‘hollowing out’ effect and transport has become more unaffordable for such workers,¹⁵ threatening the ability of London’s core employment locations to attract the workforce balance needed in the future.

¹¹ To also address the existing backlog, 62,000 new homes per year will be needed.

¹² London First, “Home truths,” March 2014

¹³ Cushman & Wakefield Affordability Watch 2015

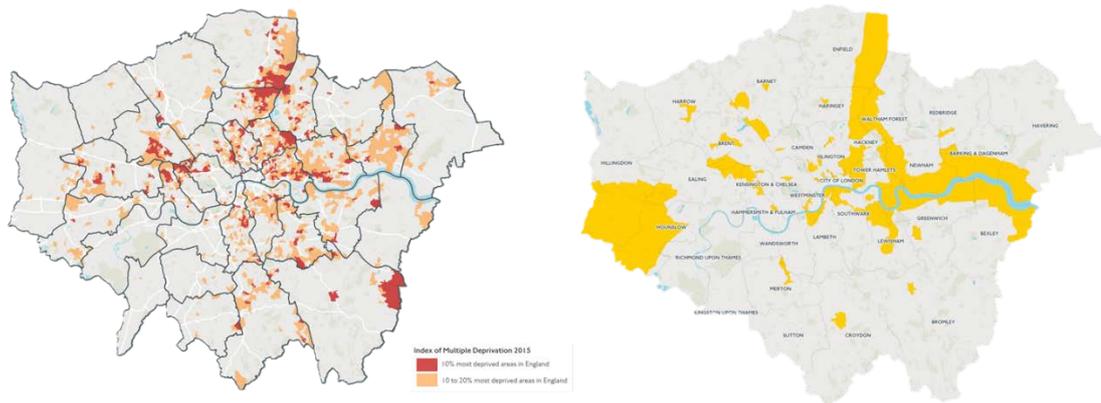
¹⁴ It will be critical in this period to ensure that the pipeline of approved units translates into delivery. Whilst on average over 50,000 housing units are given planning approval in London each year, only around 27,000 units are actually delivered. There is currently a pipeline of 261,000 approved units.

¹⁵ In 2014, it took at least an additional hour of work at National Minimum Wage to cover travel costs from outer London compared to 2005.

Furthermore, the social exclusion this could lead to could have wider consequences, damaging the reputation of the city as a place to live and invest in.

14. Pockets of deprivation exist across London and there are some geographical concentrations as shown in Figure 5.

Figure 5: The distribution of deprivation in London, 2015 (left) and London's Opportunity Areas and Areas for Intensification (right)



Some of the greatest unrealised opportunities for development are in locations in most need of regeneration

15. There is a close correlation with the Opportunity Areas identified in the London Plan, as shown in Figure 5. The Opportunity Areas:
 - are generally former industrial areas, with historically poor transport links to central London;
 - are typically trapped in a cycle of a poor quality built environment and low investment, remaining isolated from the wider success of the city;
 - represent London's main reservoirs of brownfield land and unlocking comprehensive development in them must play a crucial role in accommodating London's housing and employment needs.
16. The problems these areas face are of a scale and complexity that require coordination, in a way that markets alone are unable to achieve. New transport is a vital element and can act as a powerful coordinating mechanism for the other investment that is needed to bring about regeneration.

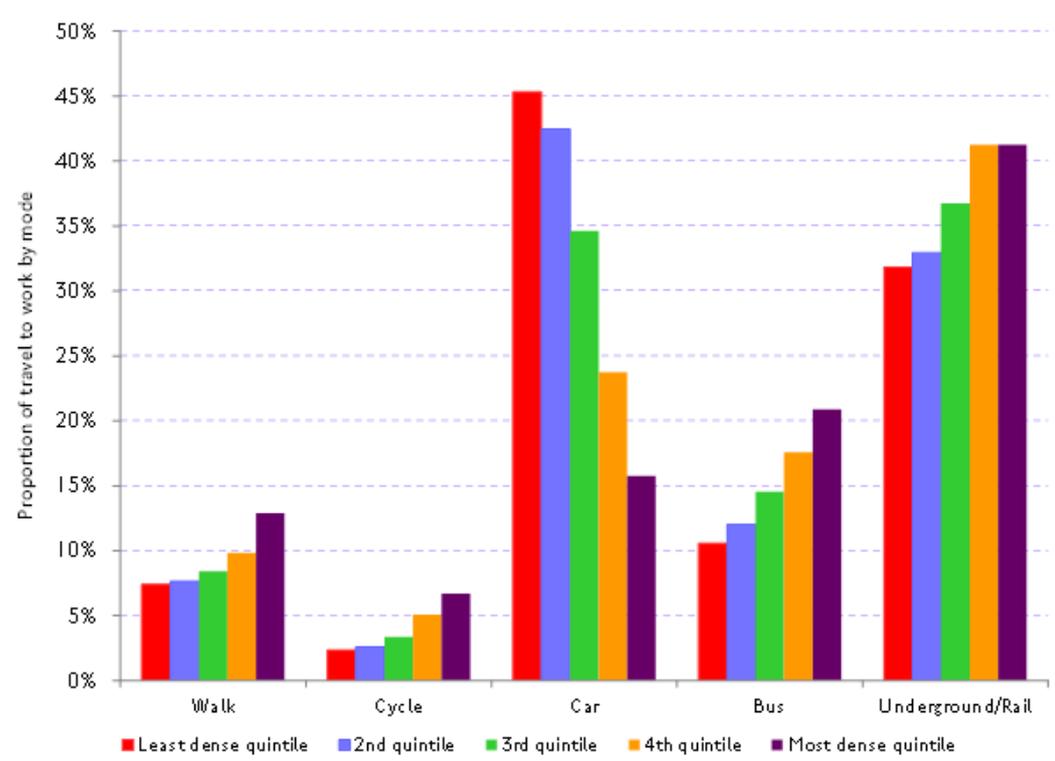
Additional housing potential must also be unlocked more widely across inner and outer London if we are to meet the overall needs identified above

17. While London’s town centres remain vital to the city’s economy, many major and district centres face decline in their traditional roles in retail and office markets. There are, however, opportunities for boosting housing supply in these locations in an affordable and sustainable way through transit oriented residential development. New connections can change market expectations, unlocking investment to make denser and better quality housing viable. This will help gain local communities’ acceptance for additional housing beyond that which they are already required to deliver. Planning policy also requires adequate transport provision as a condition for development.

Transport investment is essential to enabling the higher density development needed if London is to meet its growth challenges sustainably

18. The relationship between housing densities and travel behaviour in terms of choice of mode for journey to work is shown in Figure 6. This shows that 15% of people living in the densest fifth of London use car for travelling to work while 45% do so in the least dense fifth of the city. Given the congestion pressures facing London’s roads¹⁶, this indicates the importance of new housing being delivered through transit orient development at high densities.

Figure 6: 2011 travel to work mode shares of London LSOAs¹⁷ by density quintile



¹⁶ The rate of growth in congestion we now expect on London’s by 2031 has doubled, from 15% forecast in the MTS to 30%.

¹⁷ Lower Super Output Areas.

19. Improvements to the quality of London's urban fabric and environment will be important in maintaining and enhancing London's global competitiveness. Ensuring that new development and urban realm are well designed directly contributes to people's quality of life and well-being and will be ever more important as densities increase.

20. There are also growth pressures to accommodate more housing beyond London's boundaries. Focussing London's growth as far as possible within its boundaries is more sustainable than the alternatives and the London Plan aims to accommodate London's forecast population growth and need for housing within the Greater London boundary. Transport investment is critical to enabling the densities that this will require. Delivering more housing in reasonably close proximity to key employment areas also makes sense if we are to ensure an appropriate range of workers are available to meet London's labour supply requirements.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

- **How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?**
- **What might their potential impact be on employment, productivity and housing supply in London and the southeast?**

21. In recent years there has been an ambitious programme of investment to both expand London's public transport system and renew and upgrade the existing assets. Crossrail and Thameslink will be fully open within the next four years and the programme of modernising the Underground is well underway. This scale of investment has been possible through growing fare revenues, a strong commitment from successive Governments with grant funding, and prudential borrowing.
22. Key priorities for the coming years include the re-signalling of the Circle, Metropolitan, District, Hammersmith and City Lines and the Deep Tube Programme, which will mean new rolling stock and signalling on the Piccadilly, Central and Bakerloo Lines. We also need to get the most from London's existing railways - creating additional capacity on the network by introducing faster, more frequent, metro-style services and maximising the benefits of the heavy rail infrastructure that is already in place.
23. This investment will keep London moving for the next decade or so – ensuring that the large and complex public transport network can handle growing demand and at the same time enable a shift away from car use and meet transport users' growing expectations. It is vital that this programme is continued and its importance was recognised in the provision for capital grant funding made in the 2015 Spending Review (although the implications of the removal of the revenue grant need to be more fully understood).

The need for a pipeline of long term infrastructure investment, with Crossrail 2 at its heart

24. It is clear however that a pipeline of further large scale strategic interventions to provide 'new infrastructure' are going to be needed to meet London's growth challenges beyond the next ten years. This will help drive long term productivity and improve the public finances. We are cognisant of funding and supply constraints and our aim is to develop this into a coherent, phased and manageable programme that is affordable for London and the UK, with a strong focus on managing down costs and maximising value for money. A stable long term pipeline of investment will offer greater certainty for our supplier base, allowing better planning. Failing to achieve this can add 15% to project costs.
25. London's integrated strategic planning process, with the London Plan and the MTS at its heart, provides a framework for identifying and prioritising investment needed over the next 20 years, with TfL's business planning cycle providing more detailed prioritisation over the shorter term. The Mayor has also produced a 2050 Infrastructure Plan for London which looks to the longer term.

Together, these processes address all the different dimensions, geographies and transport modes involved in a city such as London over multiple decades

26. It is likely that new versions of the London Plan and MTS will be produced for the next London Mayor. We do not want to pre-empt this wider process here – but it is clear already that Crossrail 2 will need to be at the heart of these strategies and the pipeline of schemes and the NIC must support its ongoing development as a matter of urgency. Such an intervention requires a significant commitment of resources at the planning and development stage. Without this it will not be possible to meet the timescales for delivery that are required to meet the overall strategic planning challenges that have already been identified and are generally agreed upon.

Our focus for the NIC

27. Key considerations for determining the appropriate allocation of resources for major new ‘national’ infrastructure are set out below. Given the focus of the NIC these are narrower than those which underpin the London Plan and MTS. These are intended to assist the NIC in making its recommendations to the Government on prioritisation of national resources for large scale transport infrastructure – and more immediately those required for planning and developing them. The following should be considered:
- the scope for unlocking genuine economic potential through intensifying or transforming the way land is used, as expressed through economic performance measures such as GVA, and the extent to which this is additional at the national level;
 - the key constraints that prevent people and places from realising their economic potential, including both transport bottlenecks and shortages of housing;
 - the wider impacts including the sustainability implications of alternative strategic choices;
 - the ‘economic payback’ of large scale infrastructure investment and the implications for national level funding through the impacts on fiscal receipts associated with the economic performance benefits;
 - the opportunities for regional and local funding from development that is unlocked and other sources;
 - the pressing nature of the strategic challenges and the timescale for addressing them, in particular the threats to continued growth arising from constrained transport capacity and inadequate connectivity as population pressure increases.
28. The current MTS and London Plan both contain explicit support for prioritising a major new radial rail route serving central London on a northeast – south west axis and the Strategic Outline Business Case submitted to the Government in June 2015 sets out the case for this in detail, together with the expected impacts on capacity, journey times, housing supply, employment and productivity.
29. In particular, the scheme provides a major expansion of the system of radial transport links serving London’s global employment centres. This will relieve the growth constraints that are expected by the time it is due to open in the early 2030s. As well as solving a series of critical transport bottlenecks, it will connect the network serving London’s global employment centres to major

development areas, facilitating the dense new housing needed to help meet London's long term labour supply requirements. The key benefits include:

- crowding relief to a network forecast to be operating under stress despite significant planned and committed transport investments reflecting a combination of faster and more direct journeys, less crowded conditions on-train (notably SW, WAML, Victoria and Northern lines) and relief of crowding and delay at key stations, such as Waterloo, Liverpool Street, Euston and Vauxhall. For example, the scheme would contain growth in national rail demand at Waterloo - which currently stands at 82 million passengers per year - to 13% growth by 2041, rather than 50%;
- significant journey time benefits, eg a reduction of around 15 minutes between Wimbledon and Tottenham Court Road;
- 200,000 net additional homes (with appropriate new planning policies in place) over 20 to 25 years across London and the SE (the Crossrail 2 Growth Commission is reviewing this and an update will be provided to the NIC as part of TfL's 12 February submission). The land value uplift associated with these close to route homes only, and the associated impact of improved transport capacity and connectivity on housing density they represent, has been assessed at £15bn PV;
- once operational, up to 200,000 new jobs - between 50,000 and 70,000 new local jobs as a consequence of enhanced development, and some 135,000 in central areas;
- in addition there would be temporary employment of up to 60,000 construction jobs (including supply chain).

30. As part of the development of Crossrail 2, many alternatives have been considered, including on Network Rail solutions as well as alternative schemes. While it is feasible for a package of alternative schemes¹⁸ to address some of the problems in the same corridors, there are considered to be no feasible alternative schemes, either individually or cumulatively, that could generate the combination of capacity and connectivity benefits that offer the transformative impact on economic performance that Crossrail 2 is expected to bring about.
31. The critical feature of Crossrail 2 is that it provides large scale new capacity across central London that addresses a series of bottlenecks associated with the mainline termini and onwards links from them. In contrast, improvements to national rail corridors in isolation would place extra pressure on London's crowded main termini, and on key pinchpoints on the Underground network. For example, while four tracking the West Anglia mainline is a prerequisite to Crossrail 2, its full benefits are contingent on the extra capacity within and across central London that Crossrail 2 delivers. Similarly, the benefits of increasing capacity on the South West mainline depend on the elimination of other bottlenecks on the routes that link it to the main employment centres.
32. By tackling a series of critical network bottlenecks and creating new and better connections (easing housing supply constraints on future labour supply), Crossrail 2 will facilitate a significant increase in the overall economic density of London's key global employment centres. This is the basis for the estimated increase in numbers of jobs of 135,000 in these very high value areas. The resulting net

¹⁸ for example four tracking the West Anglia lines between Tottenham Hale and Broxbourne, with five tracking improvements into Waterloo

additional Gross Value Added (GVA) to the UK economy is estimated to be in the range of £1.2bn – £7.9bn per annum by 2041 (ie up to £102bn). This analysis shows how Crossrail 2 offers the opportunity to achieve significant increases in the productivity of London and the UK and to cover much of its costs through increased wealth generation and tax receipts. Nevertheless given the widely dispersed nature of the issues that together need addressing if London is to meet its strategic challenges effectively, it is clear that no single scheme will on its own be enough.

33. We are asking the NIC to recommend that the Government take the necessary steps to enable a Hybrid Bill to be submitted before the end of this Parliament. This requires an application for statutory powers in the coming years which would allow the delivery phase to commence in 2020 and the scheme to open by 2030. The sponsorship and consent costs associated with this are £250 million and we are seeking the NIC's support for funding from the Transport Development Fund for a significant proportion of this. If insufficient funding is made available for these activities there is a risk of setting the project back by at least half a decade, which could constrain London's growth.

Integrating more areas into the transport network

34. This is why Crossrail 2 is the focus of our ask to the NIC. Nevertheless given the widely dispersed nature of the issues that together need addressing if London is to meet its strategic challenges effectively, it is clear that no single scheme will on its own be enough.
35. A mixture of further strategic, intermediate and smaller scale schemes is needed beyond Crossrail 2 to unlock development and tackle particular challenges by knitting more parts of the city into the transport network. This will fill gaps in connectivity to enable more areas of the city to fulfil their potential, help address London's housing challenge, and ensure Londoners can access the opportunities and benefits of the city's growth.
36. This includes schemes such as a Bakerloo Line Extension, which will improve connections between central London and key opportunity areas in south east London, unlocking major housing potential and an extension of Crossrail beyond Abbey Wood towards Ebbsfleet which will help realise the housing potential of a key area of the Thames Gateway. These will help develop other corridors that complement the cross London 'spines' of Crossrail, Thameslink and Crossrail 2.
37. We are not seeking funding from the NIC for these other schemes but would welcome the support of the Commission for greater devolution of powers and funding mechanisms to enable cities like London to develop and progress such a pipeline of investment to help drive economic growth for the UK and tackle the challenges we face.
38. For example, in more recent years there has been an increasing focus on ensuring a similar 'upgrade programme' for our roads, as well as rail. London's roads are vital to the efficient day to day movement of people and goods and in fact support the majority of journeys made in the city. The Roads Modernisation Plan represents the first tranche of investment associated with this programme. It does not however provide sufficient funding to realise the fuller vision; in fact a large funding gap exists for sustained and more strategic roads investment.

39. Unlike public transport modes, which generate revenue from fare payers, there is very little cost recovery on the roads. Under the new system of VED announced by Government, revenues will be ring-fenced for spending on strategic roads in England (those operated by Highways England) from 2020/21. It is vital that the strategic road network within London (which was transferred from the Highways Agency in 1999) also benefits from this funding stream, with projects such as New Thames crossings vital to unlock jobs, homes and growth across the east of London by addressing the severance that hinders integration of the economy north and south of the river.

40. TfL is working on a number of these potential infrastructure options to address the range of different challenges which will inform the development of any new MTS. But these are not alternatives to Crossrail 2.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

See separate submission with agreed deadline of February 12th .

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

- **What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?**
- **What innovative funding mechanisms could be considered to support delivery of key schemes?**

41. Following the 2015 Spending Review, TfL's Operating Grant is being phased out; and, in light of the prospective full devolution of business rates, it is possible that from the 2020s funding of the renewal and upgrade of TfL's core Underground and rail network will come entirely from non-Government sources (i.e. a combination of fares, third party income and local taxes such as council tax and business rates). This represents an unparalleled step-change in TfL's relationship with central Government as TfL transitions to financial self sufficiency.
42. London is unique in that many of its transport projects have a substantial economic benefit and are partly or even fully self-funding, even under the current fiscal regime in which less than ten per cent of taxes paid in London are retained in London. The extent to which different schemes require central Government funding varies, with schemes such as the Northern Line Extension being entirely locally funded through developer contributions and retained growth in business rates. Crossrail has a Government contribution of around one third of the cost.
43. Building on PwC's 2014 Funding and Financing Study, the Crossrail 2 Business Case shows that London could contribute over half of the funding for the project, through direct contributions and borrowing against a variety of sources:
- Net revenues generated by train operations;
 - Over Station Development / sale of surplus land;
 - Continuing the Mayoral Community Infrastructure Levy (CIL), at an increased rate;
 - A continuation of the Business Rate Supplement (BRS) – currently hypothecated to Crossrail 1 – beyond the repayment of Crossrail debt;
 - continuation of the London-wide Council Tax Precept originally established for the Olympic Games, currently due to end after 2017/18.
44. If we are to be able to increase London's contribution to Crossrail 2 (and fund other needs of a rapidly growing city at the same time), then we need to enhance London's ability to capture and retain the additional revenues that will result from the economic benefit of major transport improvements, including effects on property values and business taxes. This could include consideration of:
- Stamp duty land tax (e.g. as a 'payment by results' mechanism within specified zones where growth in housing would be unlocked, or more widely, linked to delivery of housing targets);
 - Enhanced retention of business rates (including the proceeds from revaluation as well as stock growth);
 - Reform of residential property taxes (council tax)

- Borrowing capacity for opportunistic early land acquisition around planned transport investment corridors (as many local authorities, who do not face the same borrowing restrictions, do);
- CPO and MDC power to assemble land ahead of formal funding announcements;
- TfL to acquire land compulsorily not only for transport, but also for regeneration and housing;
- TfL to grant long leases on new residential buildings above its stations;

45. Some local sources of funding have limits. Fares on the Underground network are already quite high in London relative to other major cities around the world, but TfL currently does not achieve an operational surplus on its business as a whole so as to be able to fund major incremental capital investment. The ability of the Mayor to impose higher local taxes or to raise debt is severely constrained by central government. Congestion charges already fund a proportion of investment on the roads network, but in fact, relatively little revenue in London is raised from the roads, in stark contrast to the over 30% of TfL's income that comes from Underground and other fares. This means road improvements are either reliant on central government grants or contribution from public transport users. The Silvertown project will be funded by new tolls on road users, which could offer a model for a way forward for some schemes, but will not help solve the wider problem of how to provide the funding needed to cater for a growing population.
46. Londoners pay about £0.5 billion a year through Vehicle Excise Duty (VED). This money currently goes to central Government for general public expenditure, but from the end of the decade, all VED in England will go into a Roads Fund to pay for sustained investment on the English Strategic Road Network (the network managed by Highways England). Given that VED is linked to the specific address of the vehicle owner, there is a particularly strong and justifiable basis for hypothecation of the revenue raised in London for use on its strategic roads or transport infrastructure, or devolution of the power to determine VED structure to London.
47. It is likely however that even the sources set out above will be insufficient to fund the investment needs of transformational schemes such as Crossrail 2, as TfL has made clear in its submission. Crossrail 2 also generates a very significant proportion of its transport benefits (around 30%) from origins outside London, as well as housing impact in the wider South East, national supply chain impacts, and significant employment and productivity gains at the national level, so in the absence of more radical devolution proposals (which are likely to be many years hence), support from the Exchequer is both appropriate and necessary.
48. As regards financing and delivery, TfL's investment programme is financed using a mix of sources including borrowing from the PWLB, from the capital markets, and using private finance in models for projects such as the Silvertown river crossing. In each case, the decision is made based on value for money considerations.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

49. There are a handful of city regions in the world of a similar scale and level of development to London¹⁹, including Paris²⁰, New York²¹, Hong Kong²² and Singapore²³. While all of these cities face competitive challenges, London is growing at a faster rate than the others²⁴. All have policies in place that seek to encourage higher density development around rail stations, reduce dependence on the private car and support greater use of sustainable modes. London can be regarded as a strategic planning leader, with well integrated land-use and transport strategies in place to deliver sustainable growth. It has been unique in delivering a major shift away from car and to more sustainable modes in terms of relative shares (around 11% since 2000). However, compared to other cities the funding to support growth is less secure and the time cycle for funding is not integrated with planning cycles.
50. In Paris, the planning authorities and RATP have developed a long term land-use planning and transport investment strategy, known as 'Grand Paris' with an estimated investment requirement of €200 to €300 billion of investment to 2025 (although this horizon is now expected to be extended). The plan includes 100 major urban reconstruction projects and is expected to deliver approximately 70,000 housing units per year as well as office space through densification of urban areas around new stations. Investment of €40 billion in public transport is envisaged, with a significant emphasis on improving orbital connections between existing outer high density housing areas. It is however important to recognise that the spatial development context in Paris is very different to London's, with greater constraints in the city centre and a more polycentric pattern of employment, which is less reliant on agglomeration benefits.
51. The city state of Singapore has had a consistent strategic policy approach towards growth and development since 1971, based on transport-orientated development along mass transit spines connecting into the central business district (CBD). Since the early 1980s Singapore has been investing in expanding and improving its metro network to improve access to the CBD. Bus services act as feeder services, with easy interchanges at metro stations and don't duplicate metro lines. The Land Transport Authority (LTA) owns metro infrastructure and invests in new capacity. There are plans in place to double the length of the metro network by 2030. Funding is provided by Government and future fare incomes, which support borrowing. Around a third of the operator's revenues are raised from non-fares sources, such as rental incomes and advertising at metro stations.
52. MTR, the urban transit agency of Hong Kong, is notable for being very active in property development not just at stations but in the catchment areas around them. The government grants

¹⁹ The population of London's metropolitan area is 13.9m using the Eurostat definition. The wider labour market catchment, extending across the wider south east has a population of 23m (GLA).

²⁰ The Greater Paris population is around 12m.

²¹ The population of the metropolitan area of New York is around 12m, with around 20m in the wider labour catchment area.

²² Hong Kong's population is 7.6m.

²³ Singapore's population is 5.5m.

²⁴ Around 1.5% p.a. in London and between 0.5% and 1.3% p.a. in the other cities.

exclusive property development rights for land in the vicinity of metro station areas to MTR below market rates. Hong Kong has been a pioneer in using this approach to fund railway projects, and other cities are increasingly looking to implement it. TfL's land holdings are more localised than MTRC and focussed on operational requirements, and there is a much more circumspect approach to the scope of planning powers, which means only land needed to meet railway requirements can be included at present.

53. New York also has a different spatial pattern to London, heavily affected by its specific site and the density of commercial and residential development in Manhattan. Plans in New York include an additional subway (2nd Avenue) and better connections between the boroughs. New York's funding reflects the set up of city, states and federal levels, and includes cross subsidy from road crossings and a small but significant employment tax. There is also the use of developer contributions for specific schemes (such as the Hudson Yards). It is worth noting that New York is receiving 50% of its funding for the 2nd Avenue & East Side Access projects (as well as 50% for the emerging proposals for a new Hudson River rail capacity project) from the Federal Government – higher than Crossrail 1 or the proposals for Crossrail 2.

Appendix 2 - Setting London in context

The challenges of growth

1. London's infrastructure challenges are closely tied to population growth, which in turn reflects the strength of its economy. London's population is growing rapidly, with the city recently eclipsing its 1939 peak of 8.6 million people. Current projections suggest that London will reach 10 million by 2030 and 11.3 million, more or less, by 2050. Such rates of growth will place significant pressure on London's infrastructure systems - most notably housing and transport, but also energy, water and social infrastructure. There are also key economic, social and environmental implications. In order to manage growth successfully London will require a significant programme of infrastructure investment, alongside innovative approaches to infrastructure and development that will allow us to be more efficient, particularly in the context of reduced availability of funding and natural resource constraints.
2. Growth is in many respects a reflection of London's success – a testament to its productivity and competitiveness, the positive international perception of London and its status as a global city. People want to live and work in London, and businesses want to invest here, recognising the opportunities London provides. But unfortunately growth brings challenges and distortions – particularly to the housing market and also in terms of infrastructure capacity. In order to sustain London's position as a top tier leading city in the global economy, further investment in infrastructure is required to increase productivity and quality of life. Despite the challenges growth brings, research undertaken for the GLA suggests most Londoners are positive about growth. A recent telephone survey with 1,000 adult Londoners found that more than 60% of Londoners believe growth will benefit them; the challenge will be to ensure this is the case¹.
3. Ensuring London meets its infrastructure challenges is not just an issue for London, but indeed the rest of the UK due to the significant contribution London makes to the UK economy. Output per worker is significantly higher in London relative to other UK cities, with London's GVA per hour standing at £38.80 in 2013 rising to £42.80 in Inner London, compared to £31.10 for the rest of the UK². London also makes a significant net contribution to the national exchequer
4. A skilled workforce combined with a comprehensive transport system enables this higher level of productivity, allowing for agglomeration benefits and a competitive clustering of jobs, business and economic activity. Despite recent investment, we know that London's transport network is undermining productivity due to capacity constraints – even after accounting for Crossrail 1, and house prices are serving as a disincentive to locate in the capital for many workers. London's rate of productivity growth lags rival global cities such as Paris and Madrid.
5. Research undertaken by GLA Economics found that other parts of the UK benefit from proximity to London due to spillover effects, and as such maintaining productivity in London is essential to ensuring the on-going growth of the UK economy. Efforts to rebalance the economy should not be at London's expense; rather they should be in tandem with investment in the capital.

Work undertaken to date: The London Infrastructure Plan 2050

6. In 2014 the Mayor published the London Infrastructure Plan 2050 (LIP2050) to ensure that London has the infrastructure it needs to remain one of the best cities in the world in which to

¹ Telephone survey with 1000 adult Londoners in March 2015

² GLA Economics, 2015, 'Productivity in London'.

live, work and do business. The LIP2050 sets out a series of expectations regarding the delivery of infrastructure in the 21st century – digitally connected, green, integrated, innovative, and understood as a system of systems. The LIP2050 acts as an evidence base for an on-going, strategic conversation about London’s future infrastructure requirements, and has strong potential to inform the development of a new National Infrastructure Plan. It will also inform the mayor’s statutory strategies which will require revision following the Mayoral election in May 2016 – these include the London Plan (the overarching strategy for the capital and London’s spatial development plan), Economic Development, Transport and Environmental strategies.

7. In view of environmental and fiscal constraints our analysis found that London as a city needs to operate more efficiently and sustainably in order to meet its future infrastructure requirements. Investment in the context of growth should be targeted at improving productivity, increasing resilience and promoting sustainability.
8. In the recent past, the Mayor has focused on leveraging infrastructure investment to unlock housing development (and to obtain financing for infrastructure from development, as was done with the Northern Line extension – an innovative model which can be imitated elsewhere). However, in the longer term, the expectation will be that investments in new infrastructure will be made in tandem with smarter land use, improved planning and coordination of infrastructure relative to development.

Other elements of the London Infrastructure Plan

9. London’s infrastructure requirements beyond transport are significant, and at the heart of these requirements is housing. Increasing housing supply is the number one challenge facing London as a city. The London Plan sets out a target to build 49,000 homes a year to meet historical and arising housing demand. Such a number requires a near doubling of current output, to a level of supply not seen since the 1930s. Infrastructure, (particularly transport infrastructure) is one of the key levers available to unlock sites for housing development throughout London. As a case in point, the impact of Crossrail’s arrival in 2018 can already be seen, with more than two fifths of planning applications within a kilometre of a Crossrail station citing the new railway as a justification for the development proceeding – equating to around 53 million square feet of residential, commercial and retail space.
10. Infrastructure has the ability to make sites viable for development, and as such it is important that it is planned, delivered and coordinated with this in mind. There is also a need for the public sector to be more active in capturing the value generated by infrastructure investment, as this will allow for further investments, and provide a funding source.

Utilities

11. Housing and transport are not the only areas for further infrastructure investment. In order to ensure sustainable growth outcomes, attention also needs to be given to the key utilities which underpin the effective functioning of London, including water, digital connectivity and energy. Ensuring delivery of these required services is complicated by the fact that the Mayor does not have strategic authority over these areas, even though the Mayor is required to set the overall development strategies for the city.

Water

12. A growing challenge for London, with key issues relating to water security, flood risk and water quality needing to be addressed. Estimates put forward as part of the LIP2050 work identified an emerging supply and demand gap reaching 10 per cent by 2025, and this could be exacerbated by issues such as a failure to address leakages or encourage more sustainable rates

of consumption. The GLA is working with London's water companies and Ofwat to address some of these challenges; however as part of later stages of the work of the National Infrastructure Commission it will be important to identify how these challenges can be collectively managed in a cost effective but responsible way.

Digital infrastructure

13. This should be viewed as a utility. Provision of high speed, ubiquitous access to the internet is essential to the effective operation of a global city such as London, particularly from an economic perspective due to London's deep economic specialisations in finance, creative and digital services. The continued existence of 'not spots' both for residents and businesses across the city, including in its economic centre, suggests that the market is not operating effectively; such obvious market failures require much stronger intervention by the Government, with suitable state aid exemptions negotiated from the European Commission as necessary.

Energy

14. London's energy infrastructure needs to be developed in the most cost effective and sustainable way, with a focus on ensuring security of supply and meeting future demand. The LIP 2050 identified a 20% increase in energy demand can be expected by 2050 (after measures to reduce demand). To respond to this, government must double investment to ensure enough zero carbon energy is supplied to the national grid. We also need to ensure sufficient investment ahead of demand to unlock development sites. One in five of London's substations has less than 2MW spare capacity, however a large commercial development in London can use 8MW – and as such lead times are increasing to get connected. In order to address such issues a stronger policy of allowing investment ahead of need in the electricity infrastructure system is required.
15. Energy efficiency is vital to meeting the UK's climate change targets, and is one of the most cost effective means of reducing CO2 emissions. In tandem with efforts to address supply, such demand-side approaches should be considered as part of the work the National Infrastructure Commission is undertaking. A particular focus of this work should be on addressing the efficiency of London's existing building stock. London has some of the oldest and most energy inefficient building stock in Europe and it is expected that 80% of these buildings will still be standing in 2050. There is a need to retrofit this building stock through means such as insulation to reduce levels of energy consumption. London is already pursuing a number of programmes to address this issue, including the successful retrofit programmes RE:NEW and RE:FIT. Over 113,000 homes and 450 public sector buildings have been retrofitted as part of a Greater London Authority programme with more projects in the pipeline.
16. The inclusion of energy efficiency as a national infrastructure priority is supported by a wide range of stakeholders and businesses, including by the CBI. I hope that you will give consideration to this issue and that London can play its role in delivery an energy efficiency infrastructure programme.

Costing London's infrastructure requirements

17. Work in developing the LIP2050 was underpinned by a comprehensive cost model developed by Arup, which will continue to evolve to reflect changing priorities and assist with prioritisation and spatial planning. The analysis attempted for the first time to understand the magnitude of the full costs of London's infrastructure needs, including that of maintaining or replacing much of the existing asset base.

18. The headline figure from the Arup report is that total required investment in London's infrastructure between 2016 and 2050 will reach £1.3 trillion. Our projections show that London will need to increase its level of expenditure relative to GVA output by some 1.5% to meet its growing infrastructure requirements through to 2050, with costs doubling as a proportion of the economy over the next decade, but declining as a percentage of the economy after 2030.
19. While these estimates are based on an ambitious, policy-compliant scenario (including meeting our housing targets, decarbonising the electricity supply, and securing the necessary investment in transport), they indicate the scale of investment required, and are perhaps not unexpected given the resumption of net population growth after 75 years of no net growth at all.. Housing and transport make up over three quarters of total projected capital expenditure.

Delivering London's infrastructure

20. Work on the Infrastructure Plan highlighted a number of institutional barriers affecting the delivery of London's infrastructure, including split governance across and within sectors, varied regulation and lack of coordination. My setting up of the London Infrastructure Delivery Board was one response to these issues. It is made up of key infrastructure stakeholders in London, including the utilities across the infrastructure sectors (energy, water, digital etc.), as well as business, boroughs, regulators and Government representatives.
21. Some of its recent initiatives have included developing the London Infrastructure Database and Mapping Application, which aims to bring together information from a range of sources to support the planning, joined-up delivery and coordination of infrastructure across the capital. The mapping application identifies planned investments relative to growth and infrastructure capacity – and it provides a strong evidence base to inform future discussions around London's future infrastructure requirements on a spatial level. Other areas of focus of the Delivery Board have included testing best practice delivery in growth areas; and also advocating regulatory reform.

Regulatory challenges

22. The need for regulatory reform to support infrastructure investment is clear. The Mayor is concerned that regulatory frameworks are inhibiting development, innovation and higher levels of efficiencies. Much of London's infrastructure – water, energy, digital; is in the hands of the regulated utilities. The regulations in place successfully protect consumers from unnecessary price rises; however there are some unintended consequences. These include the fact that the Mayor has no direct influence over investment decisions, despite being elected to have strategic oversight of planning in the capital. The London Plan is not a statutory consideration as part of the process of approving business plans by the regulators.
23. In addition, regulations do not support appropriate levels of investment ahead of demand at particular locations where growth is expected to occur (and is occurring). Increased flexibility or new models of delivery are required to secure earlier investment on a more strategic basis. The GLA is committed to working with the regulators to address these issues through bodies like the UK Regulators Network.
24. In view of these issues the GLA is therefore keen to ensure that regulators require the utility providers to have regard, in particular, to the London Plan and its economic and demographic forecasts; that they require utility providers to share their plans as they develop; that they adopt more of a rolling forward planning approach (rather than fixed terms); that they take a much longer term horizon in key sectors like water and energy; that they allow for more investment ahead of demand, with a risk and reward sharing model, so that infrastructure is in

place before development comes rather than afterwards; that they encourage much more open data and sharing of data, including of future activity (via the mapping application above); and that they incentivise innovation.

Funding and financing London's infrastructure requirements

25. When developing the LIP2050, our original estimates of London's infrastructure needs were based on a number of ambitious policy scenarios, including aviation. The Plan determined that the cost of London's future infrastructure requirements are high and a significant funding gap of £135 billion is likely to emerge by 2050 when comparing expected costs against current sources of revenue.
26. To meet this challenge the Mayor has argued for fiscal devolution in order to help London better meet its funding gap. If London controlled more of the tax revenues it generates, it would be better positioned to incentivise growth and address its unique infrastructure challenges. The recent announcement by the Chancellor promising to devolve business rates is an important step forward (and welcomed), but it still is not enough to meet London's future funding challenges. More needs to be done to devolve the full suite of property taxes raised in London as recommended by the London Finance Commission, and enable new local funding mechanisms.
27. New forms of fiscal devolution to better capture value and create self-funding infrastructure schemes such as stamp duty increment zones, VED devolution should be prioritised. Increased devolution would ensure that larger infrastructure schemes could be realised faster through new or increased use of alternative funding mechanisms, such as business rate supplements, tax increment financing and enterprise zones. We have demonstrated successfully through the Northern Line extension and Crossrail the applicability of such funding mechanisms in the London context.
28. Longer term fiscal opportunities may include. London or wider South East payroll taxes or income tax supplements (either in lieu of tax cuts or additional) hypothecated for investment. A recent survey of Londoners found that around 60% of Londoners were willing to pay more income tax by giving up part of a tax cut in return for increased infrastructure investment³. Wales and Scotland, much smaller economies, have such powers on a much greater scale – as do many other cities and regional economies worldwide. London is much more reliant upon national decision making and national spending transfers than comparable cities: for example 74% of GLA and borough expenditure is funded from intergovernmental transfers, compared to equivalent figures of 31% in New York and 18% in Paris⁴.
29. These approaches provide London with increased capacity to address its own needs – enabling new financing and funding mechanisms and improved accountability. It will also remove a layer of the political process in realising infrastructure in the capital, speeding up delivery and approval. Without the funding levers to invest appropriately, the mayor's capacity to invest in infrastructure will be severely constrained.

³ Mayor of London, July 2015 – telephone poll of Londoners

⁴ London First, 2015 'London 2036: an agenda for jobs and growth'.

Greengauge 21 consultation response to National Infrastructure Commission: London's Transport Infrastructure

Greengauge 21 welcomes the opportunity to respond to the National Infrastructure Commission call for evidence.

In the first part of our response, we explain why a strategic framework, currently lacking, is needed to consider investments such as Crossrail 2. We put forward common criteria that we believe should be considered in all major (transport) investment decisions. The second part responds to the specific issues raised in the London's Transport Infrastructure consultation.

(i) The need for a strategic planning framework

The Northern and London transport initiatives are being considered by the NIC against a backdrop of continuing high annual rail demand growth and of major investments in the rail sector (and a substantial highways investment programme too). It is clear that substantial further investment will be necessary.

Our contention is that there is (still) no overall strategic plan or vision for the development of the national rail network. The risk is of failure to plan effectively the many interfaces and potential overlaps between projects, with the attendant dangers such as wasteful or even nugatory expenditure; untenable levels of disruption to services and local communities; and spikes in demand for the supply chain. Crossrail 2 would benefit from a wider rail strategic plan for London and the wider South East.

We recognise the planning work that Government (through DfT), Network Rail and the ORR undertakes to establish 5-year investment programmes for rail. But there is no longer term strategy.

We believe that there needs to be a *rationale* for new project possibilities set at a national level to help form the narrative on the need for such schemes, and to complement the business cases that project promoters (*e.g.* TfL and TfN) will be developing. Under EU law, while the recent precedent with HS2 may suggest otherwise, there is possibly a legal need for a strategic environmental assessment, and the wider strategy we call for could address this need or agenda.

Greengauge 21, through its Public Interest Group formed in 2008, with sponsorship of the English RDAs, Network Rail, TfL and many other public authorities across Britain, created a national strategy for high-speed rail ('Fast Forward', published in September 2009).

With appropriate support from stakeholders, building on its experience with high-speed rail, Greengauge 21 is seeking to develop during 2016 a broader *national rail development strategy*. This will include consideration of high-speed rail, but look more widely, at all forms of rail operation, passenger and freight. It will also consider the important interface between the national network and city region metro systems – a neglected area of study and one which is of particular relevance to Crossrail-style projects – projects which, in general, we believe are a highly effective way of developing the rail network. We would welcome exploring how it can be used to serve the National Infrastructure Commission objectives going forward.

In that work, we plan to develop clear criteria applicable across the nation when considering major rail investment options. We have identified five criteria that we believe the Commission should apply to the Northern and London cases – and indeed to all future transport investments of significant scale. These are:

1. Regional (and city region) economic need
2. Housing growth need
3. Capacity need
4. Implementation sustainability
5. Compatibility (with other projects and with changed circumstances) and sequencing.

The first criterion – regional (and city region) economic need – is straight-forward: there must be spatial plans. London, uniquely, has such a plan for 2050, provided under its statutory obligation from the Greater London Act.

Greengauge 21 considers it is essential that London's plans are kept up-to-date, developed comprehensively, with private sector inputs, so that a contemporary account of economic development outlook is available at all times. Otherwise, transport (and no doubt other) investment can only be considered in a vacuum.

Crossrail One was, in our judgement, ultimately given Government approval to proceed because of the existence of a clear long term expectation on the scale and location of the capital's future population and employment growth. Without wider

plans or frameworks, transport investments risk being distorted towards meeting existing/short term/foreseeable transport network congestion issues or other shortcomings: the investments may still be worthwhile, but they are unlikely to be transformational and will leave open to chance whether wider economic and housing policy objectives are met as fully as they could be.

The existence of long term, spatially defined, growth plans in the London case goes a significant way towards meeting the second criterion (housing growth need). But it also serves to highlight the problem in the surrounding shire counties, where previous regionally-set housing growth targets have been squandered. Planning Crossrail 2, for example, which is said to 'connect Surrey with Hertfordshire', is hindered by the lack of longer term quantified and spatially-based plans for these counties. Greengauge 21 urges the Commission to call for this lack to be made good. The Commission is well-placed to consider questions like overheating of the housing market in London/Southeast (and the apparent lack of demand across much of the North).

The third criterion – capacity – needs to be driven by a range of demand growth scenarios which include a continuation of recent trends as well as the lower, more cautious forecasts used by DfT.

Consideration needs to be given to *what if* scenarios, rather than a single central demand forecast (including the effects of policy or technology shifts; funding availability and implementation slippages; market trend inflections). This should include thinking about *flexibilities* with operating pattern assumptions and hence wider outcomes.

There is a particular gap presently in the area of freight forecasts where major revisions are needed to take into account the possible impacts of port developments – especially Thames Gateway – and the emerging markets for rail in meeting domestic logistics and distribution network needs, including into urban centres.

And when considering capacity, the closely related area of punctuality performance needs to be addressed as well. There are often non-infrastructure solutions to capacity problems that are appealing for cost reasons but leave the network – which is already busy – overloaded and subject to poor punctuality performance.

The fourth criterion – implementation sustainability – is intended to help guide the nature or version of specific interventions and projects, applicable on a consistent basis across the nation. It has three distinct components:

- The ability of the region/corridor served to sustain any adverse environmental impacts, and specifically, the loss of land currently not used for transport;
- The likely impact on land use development, summarised on a single dimension of inducement towards densification/intensification of existing developed/formerly developed ('brownfield') land at one end of the axis and new development ('greenfield') and dispersion/sprawl at the other end; this is a key indicator for wider carbon/energy outcomes;
- The ability of the region's/corridor/s transport system to sustain economic objectives during periods of disruptive construction.

In effect, work in this area should help guide the type of investment needed: whether it would be better to upgrade existing or to go for new build; to serve existing urban developments or foster and encourage new settlements; to propose new transport infrastructure at-grade or in tunnel, and so on.

The fifth criterion – compatibility and sequencing is often missing from project-specific appraisals and gateway reviews. Applicable at project level, a compatibility matrix for Crossrail 2 covering rail investments is shown below. There is a high level of complementarity, with some other projects representing real opportunities for integrated designs and cost savings – in particular, the planned upgrades for the South West, Brighton and East Coast Main Lines as well as the possible DLR extension from Bank to Euston and plans to connect Stansted better with central London (which could be achieved with a Lea Valley upgrade scheme or with a totally new alignment – the latter having the potential to address wider issues such as ECML capacity).

Many projects are complementary and some would feed traffic onto Crossrail 2. Long term plans to increase tube line capacity (e.g. the Piccadilly Line) may, on the other hand, have an adverse impact on the business case of Crossrail 2 and the Thameslink project and other plans to improve Stansted connections could substitute in part for Crossrail 2 (but equally, with care, could act as good complements too).

Other project interfaces we judge most likely to be overlooked that represent real opportunities that could be precluded (or made costlier) by Crossrail 2 implementation include the outline plans for an outer London orbital railway in the London 2050 Plan (the scheme shown uses the same railway between New Malden and Teddington as Crossrail 2), and the DLR extension to Euston where an integrated station design could bring wider benefits to both projects.

Crossrail 2 Compatibility Matrix

COMPLEMENTARITY				PROJECT	OVERLAP	
Integrated design opportunity = ££ saving	One project feeds the other	Precursor project, builds market for Crossrail 2	Independent		Partial substitute, so business case impact	Clear alternative
▪		▪		SW Main Line Upgrade	▪	
▪				Brighton ML Upgrade		
▪				ECML Upgrade		
			▪	GEML Upgrade		
▪	▪			DLR Euston Ext		
				Tube capacity	▪	
			▪	Northern Line Ext		
			▪	Croydon Tramlink devt		
	▪			London 2050 plan orbital rail		
	▪			LHR southern access		
	▪			HS2		
▪				Stansted Express & Lea Valley scheme		▪
▪			▪	Crossrail 1 Extensions		
				Thameslink	▪	

The related question of sequencing is not the same as phasing. It concerns questions of what actions/investments are precursors for others and what might be precluded subsequently by early decisions, as well as optimum timings. It is crucial to thinking about strategic fit and meeting one of the criteria that Sir David Higgins identified for HS2: standing the test of time.

(ii) London's Transport Infrastructure

Developing London's transport infrastructure has involved lengthy timescales, and in some cases policy reversals: the abandonment of the 'Northern Heights' underground line extensions in the 1940s and the partial implementation of the London ring motorway schemes in the 1973 Greater London Development Plan before their abandonment serve as lasting examples.

Lengthy planning timescales allowed schemes such as the Victoria Line (1960s) to be designed to achieve key customer benefits such as the cross-platform interchange between the Victoria and Bakerloo lines at Oxford Circus. Subsequent tube developments have been less satisfactory, requiring level changes for transferring passengers at interchanges that have become much costlier to construct.

For rail, there have been broadly three types of development:

- Those initiated by London Transport/TfL – and the seminal (but very rapidly carried out) Central London Rail Study of 1988 (the clue to much of what followed in terms of the specification of Crossrails 1 and 2 is in the word *central*)
- Projects designed to get more out of existing infrastructure, and London underground has now built an excellent track record in increasing capacity with higher service frequencies, alongside station by station measures to increase access/interchange flow capacities; also in this category would be the London Overground
- Other rail developments not initiated by London Transport/TfL – and these have included the DLR, Croydon Tramlink, the Croyley Link (now re-labelled the Metropolitan Line Extension). Interestingly, these are schemes largely outside central London. The Jubilee Line and Northern Line Extensions were both initiated by property developers. But all of these projects have ended up under TfL's overall management (including in most cases through the construction phase).

There has been no successor to the Central London Rail Study carried out 27 years ago, nor any comprehensive plan for developing London's rail network across inner and outer London. So there is a planning vacuum around Crossrail 2.

The sequence of events with Crossrail 1 implementation is relevant. It had been selected as the priority from the various Central London Rail Study (CLRS) schemes

but its Parliamentary Bill was thrown out in 1994. A subsequent study led by the Strategic Rail Authority in 2001 examined the need for investment (The London East West Study (LEWS)), and this studied a wide range of options and considered the needs of freight traffic, for example, as well as passengers. No equivalent study has been carried out for Crossrail 2; its selection is based on the now ancient CLRS study, where it came in second. Crossrail 1 was revised following LEWS to include an alignment serving Whitechapel and Canary Wharf – and the earlier objections from London Borough of Tower Hamlets that had stopped the 1994 Bill did not recur.

In terms of the road network, there has been a continuing erosion of network capacity for vehicles attributable to local demand management measures, and better provision for cycling and pedestrians. Vehicular travel speeds have declined in all parts of London over the last ten years as a result, even with static and slightly falling traffic volumes.

The review led by Deputy Mayor Isabel Dedring in 2013 identified the potential role of tunnelled roads and a possible inner ring scheme was published in May 2014¹. Because of the high levels of suppressed demand, any increases in road network capability for vehicular traffic will be self-defeating as a means to tackle road congestion; road user charges or tolls would need to be considered; price levels would have to be punitive. In short, it is not realistic to plan on expanding the road network to add general vehicular traffic capacity. On the other hand, there is strong demand for additional space to be set aside as public realm; there is a very critical need to achieve gains in air quality (so pedestrianisation of Oxford Street should be a priority, especially given the access gains that Crossrail 1 brings²); and there is a need to accommodate buses, service vehicles and emergency services with a much reduced risk of delay from congestion.

This suggests that tunnelled road schemes with these wider user objectives should be developed – but explicitly not as a means to increase general road traffic capacity.

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

The problems of success – a prospering city, with economic strengths not just in financial/business/professional services, but also in creative/digital media and culture, in tourism, retail, in Government, in law/justice, in research and learning.

¹ <https://tfl.gov.uk/corporate/publications-and-reports/roads-task-force>

² See West End Commission, final report April 2013 www.westendcommission.com/Report.html

With high population growth, in both London and the surrounding regions (Southeast and East of England), there are challenges to provide sufficient new housing and associated social infrastructure (schools, parks/leisure facilities, hospitals) at affordable prices.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

Road investment needs to be directed towards meeting the needs of many distinct user groups: pedestrians, cyclists, buses/trams, servicing vehicles (including to construction sites) and emergency vehicles.

Rail investment needs to address the capacity challenges identified by Network Rail, including on several major radial lines³; efficiently to cross-link radial lines; to create a limited set of orbital rail routes that convert the radial routes into a part of a broader network capability; to respond to major development opportunities as they arise in the manner of JLE and NLE; to continue the programme of station capacity enhancement and LU line capacity upgrades; to respond to the access needs of major long distance terminals (HSR and airports); to provide for cross London railfreight and railfreight terminals.

- *How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?*

Against the 5 criteria identified above and by reference to business case and benefit:cost performance.

- *What might their potential impact be on employment, productivity and housing supply in London and the southeast?*

These investments are hugely important to employment and productivity. They might have little useful impact on housing supply/prices: transport enhancement tends to drive up property values and hence prices. But planned in conjunction with new measures to achieve residential densification and to serve large scale new

³ London and South East Route Utilisation Study 2011 see [www.networkrail.co.uk/.../route%20Utilisation%20strategies/.../london%](http://www.networkrail.co.uk/.../route%20Utilisation%20strategies/.../london%20) and www.networkrail.co.uk/...studies/london-and-south-east-market-study.pdf of 2013.

developments with 'transit-oriented development', rail investments could be made supportive of the housing supply objective too.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

The *benefits* of Crossrail 2 can be increased by:

1. Ensuring it provides sufficient capacity relief to major national rail routes so that other parallel major rail investments are not needed
2. Cross-linking its branches, such as Kingston – Epsom (which will otherwise be under-utilised with perhaps only 4 trains/h) to provide part of the orbital network (and failing to do this may well preclude creating a highly valuable orbital rail system)
3. Increasing planned service frequencies to 40 trains/h. This requires full automation, but this is the norm with new metro systems.

To expand on the first point. Crossrail 2, suitably adapted, could provide for transformations of the South West and East Coast Main Lines (SWML and ECML). The four track route into Waterloo (SWML) has sufficient demand (peak passengers routinely stand for over 60 miles) to require one pair of tracks to offer a non-stop route into Waterloo, with the other pair of tracks accommodating limited stop outer suburban services to provide high frequency interchange at the key nodes along the route in London (Wimbledon, Clapham Junction and Vauxhall). The current Crossrail 2 plan will unfortunately preclude this by leaving a need also to serve Earlsfield – a location that needs to be served by Crossrail 2 running on its own tracks. It would still be possible to serve Balham and relieve the Northern Line, but this should be a separate branch, suitably extended to serve the Streatham area.

At the other end of the route, the ECML will be paralleled by Crossrail 2, but not over sufficient distance to obviate the need to operate duplicate suburban services, wasting line capacity and precluding the expansion of longer distance (and high-speed services) on the ECML corridor without building a new pair of tracks (in the style of the HS2 approach to central London). Crossrail 2 should be extended (on its own tracks) to Welwyn Garden City accordingly. A second branch should run eastwards to serve the opportunity areas along the Thames.

Costs can be reduced by adopting technology closer to that used on DLR, allowing where needed, for greater flexibility of alignment, and with 40 trains/h, potentially somewhat shorter trains and therefore lower cost stations (a combination that also

reduces the risk of station overcrowding and the need to provide for it). Unnecessary or unwanted stations (such as at Chelsea) can be avoided and faster journey times and shorter (lower cost) alignments can be selected (at least in this instance).

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

- *What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?*
- *What innovative funding mechanisms could be considered to support delivery of key schemes?*

A levy should be placed on all property in London, residential and business, to fund transport investment. Together this should provide at least 33% of the funding of projects like Crossrail 2 – with extensions into the line catchments in surrounding shire counties. Another third should come from operating profit (that is revenues less operating costs). Ticket prices will have to remain high – partly because of demand management issues – but more discounting should be available to younger residents who cannot afford the fares, from 18 to 25/30 and maybe even 40 years age groups. Government should fund the balancing third: its returns will be huge (including in enhanced tax revenues).

For road schemes, the Congestion Charge needs to be overhauled and extended to the M25. In London the road system is the one transport network which does not cover its routine costs. Use of the network by the innovative forms of service providers such as Uber and car clubs needs to be addressed separately from the regular pay-as-you go/daily tariff.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

A useful source on this subject is now a little out of date but remains reasonably comprehensive.⁴ Some cities (e.g. Oslo) have since used road tolling to fund public transport schemes.

⁴ Transport 2000 (now CBT): Financing Public Transport: How does Britain Compare? 1992

Response to the National Infrastructure Commission Call for Evidence on London's transport needs from the Royal Borough of Greenwich Conservative Council Group

January 2016

1. Executive summary

- 1.1. The Greenwich Conservative Council Group welcomes this opportunity to contribute evidence to the National Infrastructure Commission's Call for Evidence on London's transport needs.
- 1.2. We have responded to the questions laid out in the call for evidence from our perspective as a Group of (opposition) councillors representing residents in the Royal Borough of Greenwich. Our response naturally focuses on South East London.
- 1.3. Any queries about this response should be directed to Councillor Matt Clare, Greenwich Conservatives Transport Spokesperson at [email redacted]

2. Question (1): What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

- 2.1. Over the next 10 years alone 80,000 new homes will be built in the 5 most South Easterly London boroughs.
- 2.2. Large-scale building will continue beyond the current 10 year targets of 80,000 new homes. Moreover significant home building is underway further out from London on already crowded commuter routes which are shared by residents of the five South East London boroughs.
- 2.3. With efforts to shift commuters from car to public transport the already overcrowded Southeastern trains commuter routes from Kent via South East London will not cope with increased passenger volumes unless significant capacity is added and alternatives such as cycling and buses maximised.

Road capacity in Southeast London is considerably less than in North London and already overcrowded. The Silvertown tunnel, of which we are supportive in principle, will go some way to address this. However clearly the roads are at capacity with there being no option to build further. This further reinforces the arguments in favour of significant improvements to public transport in South East London.

3. Question (2): What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

3.1. **The Bakerloo Line extension from Elephant & Castle to New Cross Gate, Lewisham and onward to Catford & Hayes via an existing National Rail line is essential** to help address the challenges described above.

3.2. The Bakerloo line extension will provide

- an additional high frequency public transport route from very high population growth areas such as Catford, Lewisham and the Old Kent Road to Central London
- a freeing up of line capacity on already overcrowded regional train routes from Dartford via Sidcup and Bexleyheath as well as from Orpington on the Lewisham to London terminii stretch
- a high frequency 'turn up and go' tube service to central London from Hayes, Catford and beyond to replace infrequent trains

3.3. The Bakerloo line extension will also deliver excellent value for money. At approx £2.5bn the proposed Bakerloo Line extension represents only around 15% of the cost of Crossrail 2, but will serve heavily populated relatively central London areas not currently on the tube/train at all (e.g Old Kent Road, Camberwell)

3.4. It is worth noting that this extension was first considered in the 1930s and again in the 1950s and 1970s, long before the volumes of traffic and commuting by train we see today. Due to its currently very central terminus the Bakerloo line is seemingly the only rail line in London which has the capacity to cope with an extension like that proposed above.

3.5. **We also support the proposed London Overground extension from Barking Riverside to Abbey Wood.**

3.6. The London Overground is being extended from Barking to Barking Riverside. Continuing south eastwards to include Thamesmead and Abbey Wood would

bring significant further employment opportunities to residents on both sides of the river.

- 3.7. It is worth noting that with its 50,000 residents Thamesmead is the largest area of London to not be served by tube or rail at all.
- 3.8. **We believe that cycling infrastructure must see significant investment in South East London.**
- 3.9. South East London remains under served by public transport compared to other parts of London. Unfortunately commuting by bike is not yet as attractive an option in South East London as it is from other areas of London which are a comparable distance from the centre such as Newham, Wandsworth or Merton. This is largely due to a lack of safe segregated cycling routes.
- 3.10. The Old Kent Road, Central Lewisham and Lee High Road in particular are considered dangerous and a barrier to many people commuting to work on a bike.
- 3.11. The approved CS4 and CS5 routes will go along way to achieving this. However further extensions outwards should be considered (for example, to Plumstead and Eltham) as well as additional alternative routes. These should only continue with the consent of residents, including all types of road users, and so proper consultation with the public is essential.
- 3.12. **Crucially, the highly successful TfL/Santander Cycle Hire Scheme must be extended into South East London** in the same way that it has been to East, West and South West London all of which already enjoy far better public transport connections.
- 3.13. Extending TfL cycle hire into South East London will give more resilience to the transport network and reduce reliance on cars and buses for shorter journeys.
- 3.14. Greenwich Conservatives are already campaigning for an expansion of TfL cycle hire into Greenwich via the foot tunnels from Island Gardens, including lobbying the Labour administration of Greenwich Council to make a pro-active case to Transport for London, which it has so far failed to do.
- 3.15. It is estimated that a few docking stations could be delivered for around the cost of a brand-new double-decker bus. Contrast this with that bus which travels from point A to point B via predetermined stops and is only available at the point the bus finds itself on that route at any one time. Investing in Santander cycles gives docking stations and bikes which are available at scattered points and can be ridden at flexible times to any one of 750 docking points across London.

4. (Question 3): How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?

4.1. Given the already overcrowded and inadequate public transport in South East London (See PTAL ratings) we strongly believe that the Bakerloo line extension must be prioritised. The Bakerloo line extension can be delivered for only around 15% of the cost of Crossrail 2.

5. (Question 4): What might their potential impact be on employment, productivity and housing supply in London and the southeast?

5.1. Each of the above three projects will bring residents of South East London (old and new) within reach of more employment opportunities.

5.2. Faster, more reliable train and tube journeys into central London will be key to London remaining productive. Already with current volumes of commuters Southeastern trains are frequently delayed resulting in regular productivity losses for London businesses.



Eurotunnel submission to the National Infrastructure Commission consultation – London

Eurotunnel welcomes the opportunity to respond to this consultation, having long been aware of the need to ensure that infrastructure projects in the UK are delivered rapidly in order to support economic growth.

Overview

Groupe Eurotunnel (GET) manages and operates the Channel Tunnel Fixed Link between Britain and France, providing the infrastructure for Eurotunnel's own Shuttle services, international freight and high speed passenger trains. Completed in 1994, the Tunnel was financed entirely from private sources at no cost to the taxpayer.

GET also operates GB Railfreight, as the British arm of its Europorte rail freight brand. Acquired by Europorte in 2010, the business operates a variety of services including bulk traffic, biomass, coal steel, petrochemicals and metals transportation. GB Railfreight prides itself on its innovative approach to railfreight which has seen it win a number of rail industry awards and earn the standing as Britain's most reliable freight operator.

Maintaining effective transport links throughout the UK is crucial to ensuring economic prosperity. This allows businesses in London to transport their products throughout Britain and beyond, and also ensures that the Capital is supplied with the goods it requires.

Response

As the operator of the Channel Tunnel, GET provides crucial infrastructure for the transport of goods to and from mainland Europe. The opening of the Channel Tunnel revolutionised the UK's accessibility to the European market, which can be reached faster and more reliably than at any time.

The UK economy directly benefits from the mature fixed link to mainland Europe. Key industry sectors have built import and export business models that are only viable because of the Tunnel. For example the automotive industry can transport time sensitive components; fish from Scotland and meat from Ireland can build key export markets across Europe. Prior to the Tunnel there was no economically sustainable business model to facilitate the UK's full participation in this trading revolution.

To support London's growth through more effective access to European markets, additional highways capacity crossing the Thames to the east of London is required. This can be delivered through the proposed Lower Thames Crossing which will support economic growth and release pressure on central London crossings such as the Blackwall Tunnel. In addition, new capacity for rail freight is required through Kent, to link businesses in London to the continental market, as set out below.

South East road highways capacity and Operation Stack

However, this summer saw access to the Tunnel limited by a combination of migrant incursions and striking ferry workers. Operation Stack was enforced for 28 days and during this time British manufacturers all over the country were placed under intense pressure. The goods transferred via the Tunnel tend to be high value components for the automotive, electronics, pharmaceutical industries, fresh produce and rapid courier services, and delays in their transportation result in large costs for business throughout the UK.



Although Operation Stack has not been in force since then, the events of the summer highlighted the need to increase the resilience of road networks in the South East. The road network in Kent is vital for connecting the south of England to the Capital. With a predicted increase in truck traffic of 30% in the next five years, there is a clear need for a solution to Operation Stack and additional capacity in Kent and the South East road network. In order to maximise economic growth across the country we must keep vehicles moving. This requires long term solutions such as: adding capacity to the M20; upgrading the A2 to motorway standard; providing additional capacity across the Thames through a new Lower Thames Crossing (as noted below); and consideration of modal shift to rail freight. These changes would ensure that products made throughout the UK are more likely to be successfully transported to Europe, than the current situation where Operation Stack is enforced.

This requires long term solutions such as adding capacity to the M20, upgrading the A2 to motorway standard and also consideration of modal shift to rail freight. These changes would ensure that products made in London can be successfully transported to Europe without costly delays, and businesses in London will receive the products they need to serve their customers.

Rail freight capacity

Another opportunity for addressing congestion on the roads in the South East and to ensure greater security for time sensitive deliveries would be for the Government to invest in the creation of greater rail freight capacity across the UK.

This will encourage a modal shift from road to rail, taking lorries off the road network, releasing capacity for other vehicles and increasing the reliability of those companies using rail freight for deliveries. There would also be well-documented environmental benefits delivered by this modal shift.

The Government has committed to deliver additional freight capacity, but action needs to be taken, in particular:

- Implementing and funding the proposed European Rail Freight Corridor from Europe to London to ensure swift rail access to foreign markets.
- Completing the Kent Gauge Study proposed by Network Rail and upgrading freight routes through the county which link the Channel Tunnel to London and the wider UK.
- Investigating and delivering improvements to the network beyond London, so that businesses in the Midlands and North of England benefit from rapid rail freight access to European markets and routes to the Capital. This includes identifying and delivering capacity improvements on key rail arteries such as the West Coast and East Coast Main Lines.

Lower Thames Crossing

Finally, addressing capacity on crossings across the Thames through the creation of a Lower Thames Crossing is also crucial for ensuring prosperity. A new crossing would relieve congestion on the routes from the South East into London, allowing businesses to transport their produce in good time and smoothing traffic flows into the Channel Tunnel.



Upgrading the local Kent road network, increasing rail freight capacity, and constructing a Lower Thames Crossing would benefit London businesses by improving their ability to connect to mainland Europe and reducing delays which cause their products to lose value. Additionally, an improved road network would reinvigorate local development in the South East by creating jobs in the area, and stimulating investment as businesses become more confident that there is a reliable transportation network.

Contact:

John Keefe, Groupe Eurotunnel
[email and telephone number redacted]

Serena Balachandra, Lexington Communications
[email and telephone number redacted]



The Conservative Group
London Borough of Hammersmith & Fulham

Via email

5 January 2016

Dear Ms Dix,

Response to the Crossrail 2 consultation

As the Conservative Councillors for the London Borough of Hammersmith & Fulham, we are writing in support of a Crossrail 2 interchange at Imperial Wharf.

Last month, the TfL Commissioner, Mike Brown, assured Greg Hands MP that Imperial Wharf is “being seriously considered” as an alternative station site. This new approach is encouraging. We believe that Imperial Wharf would serve more commuters, support more new jobs and homes, offer better value and – perhaps as importantly – gain support across our borough and west Chelsea.

Imperial Wharf has significant advantages over the current plans for a station at the eastern end of the King’s Road:

Interchange – Imperial Wharf would form the main Crossrail 2 interchange with the West London Line, reducing journey times for passengers. Without a separate interchange, Clapham Junction is likely to face severe station capacity problems, because it will also handle new demand from dozens of mainline routes. The interchange would also remove pressure on Overground services at the existing Imperial Wharf station, while relieving pressure on the District Line at West Brompton, Fulham Broadway and Parson’s Green.

Passengers – based on its current catchment area alone, more commuters would use a Crossrail 2 station at Imperial Wharf. This number rises when new development is anticipated. It rises again when new bus routes in south Fulham are considered, as there would be substantial demand for improved links under Crossrail. When passengers transferring from the Overground are added, the commuter case for Imperial Wharf becomes overwhelming.

Alignment – a natural alignment from Imperial Wharf (through Clapham Junction) to Balham would not involve tight curves. Changing the orientation of the track through Clapham Junction would therefore result in faster journeys, an equivalent track length and lower maintenance costs than under the current plans. We also welcome TfL’s acknowledgement that the foundations of the riverfront buildings are navigable. There is no engineering barrier to a Crossrail 2 station at Imperial Wharf.

Cost – land values around Imperial Wharf are cheaper, with the ability to redevelop a brownfield site to offset the cost of the station. The Lots Road Car Pound site would allow a significant capital receipt from new housing, as well as a station entrance in Chelsea. There is also the possibility of s.106 contributions from neighbouring sites that are due for redevelopment. Together, these factors suggest a significantly lower cost for an Imperial Wharf interchange than building a King's Road station with no associated redevelopment.

Olympia – District Line services to Olympia have been a recurrent issue for residents, for the exhibition halls, and for solving the bottleneck at Earls Court. A Crossrail 2 interchange just two Overground stops away at Imperial Wharf would finally provide a solution, particularly when combined with more frequent Overground services. Likewise, Imperial Wharf would provide a real alternative for many more passengers at West Brompton, which faces growing pressure from new development.

Regeneration – a key aim of the Crossrail 2 project is to unlock more jobs and homes, assisting in London's regeneration. There are several major redevelopment sites around Imperial Wharf, all of which are poorly served in terms of public transport links to central London. This has hampered their progress. A Crossrail 2 interchange would spur substantial investment and create new employment around the station. By contrast, no significant development sites in Chelsea would be unlocked through the current plans.

Support – unlike the plans for a King's Road station, there is unequivocal local support for bringing Crossrail 2 to Imperial Wharf. It would benefit thousands of commuters in Fulham, both directly and by relieving pressure on the District Line. It would still benefit thousands of commuters in Chelsea, with greater benefits for the poorly connected areas around World's End and Lots Road. It would also offer benefits along the rest of the West London Line. Local residents consistently tell us that they want Crossrail 2 to serve our area.

An Imperial Wharf interchange is compatible with the original conception of a Chelsea-to-Hackney line, which for many years included safeguarded land in Fulham. It would allow a station entrance in Chelsea, on Lots Road, and others serving Chelsea Creek, Chelsea Harbour and Imperial Wharf. At the same time, it would enable Crossrail 2 to be cheaper, faster, serve more passengers and tackle overcrowding at multiple stations, while delivering the regeneration always intended.

Given these advantages, it was frustrating to see many inaccuracies and omissions in the report provided to Greg Hands MP in October. We hope that you will now commit to undertaking a proper technical study of the Imperial Wharf option, which will provide a credible basis for assessing passenger numbers, cost, regeneration potential, journey times, station alignments, tunnel routes, shaft locations, Overground usage and the impact on other stations and lines.

In administration, we urged the case for an Imperial Wharf interchange during TfL's consultation process in 2013. Given the new Commissioner's openness to rethinking the plans, we strongly urge the case again. It is a far better option than the King's Road.

We would welcome an opportunity to meet in person to discuss an Imperial Wharf station on behalf of our residents.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'G Smith', with a stylized flourish at the end.

Councillor Greg Smith
Leader of the Opposition

Councillor Steve Hamilton

Councillor Robert Largan

Councillor Jane Law

Sands End Councillors (for Imperial Wharf)

Councillor Michael Adam

Councillor Adronie Alford

Councillor Nick Botterill

Councillor Andrew Brown

Councillor Joe Carlebach

Councillor Charlie Dewhurst

Councillor Belinda Donovan

Councillor Caroline Ffiske

Councillor Marcus Ginn

Councillor Lucy Ivimy

Councillor Donald Johnson

Councillor Alex Karmel

Councillor Mark Loveday

Councillor Viya Nsumbu

Councillor Harry Phibbs

Councillor Frances Stainton

Executive Summary

Heathrow Airport Limited congratulates the Chancellor on establishing a much needed and independent National Infrastructure Commission to provide unbiased assessments of the UK's long-term infrastructure needs. Heathrow also looks forward to the Commission's commitment to monitor the Government and industry's progress in meeting these needs, because it is critical national interests are not thwarted by local political interests.

As the European Commission noted in its recent Aviation Strategy, connectivity and infrastructure – and as Heathrow's submission will outline, strategic connectivity to airports – are critical to the UK because 'studies show that the better a city, region or country is connected by air to other destinations in Europe and other parts of the world, the more growth can be generated.' The European Commission's new Strategy also recognises aviation and airports as 'strong drivers of economic growth, jobs, trade and mobility for the European Union' and hence why improving connectivity has been listed as one of the Commission's three key priorities.

The fact that connectivity has been outlined as a priority in the European Commission's new Aviation Strategy also validates the important role connectivity and infrastructure play in the UK economy and why the independent National Infrastructure Commission's work is so important. The Commission should note that it is not just city-to-city connectivity that could address connectivity weaknesses, but also strategic city-to-airport connectivity.

For example, limited and indirect rail and air links between the North and Heathrow Airport are holding back the growth of northern city regions because 'the world's economic centre of gravity has shifted towards Asia.'¹ Heathrow offers more direct and frequent flights to Asia because it is a hub airport. As a hub, Heathrow is different to other UK airports, because it can pool international, continental, domestic and local demand for leisure and business passengers as well as air freight, making direct flights to more cities around the world, particularly emerging markets, more commercially viable for airlines. It is critical that northern cities are well connected to Asia and the most viable way to do this for the UK economy is with better connectivity to Heathrow Airport.

That said the UK's regional airports still play an important role in connecting regional city regions, but they play a different role to Heathrow. For example, this submission demonstrates how as a hub, Heathrow plays a significant and different role to other airports in the country's freight connectivity. Heathrow is the most important freight airport in the UK, moving more cargo than all other UK airports combined (CAA, UK Airport Freight Data, 1990 – 2014²). This confirms the importance of connectivity (rail and domestic air links) to Heathrow for exporters in the North and indeed around the country.

While the Commission is not looking at airport capacity, it is important that the Commission notes the added benefits to the UK and the freight community when prioritising infrastructure projects and the added benefits that connectivity can bring.

As mentioned previously, with the global shift to Asia, London – and the UK's – status and its continuing success as a global centre for business is critically dependent on the quality of its international connectivity, as well as its local transport infrastructure. London is expected to see major population growth, but it is in competition with other cities around the world, so investing in London's transport infrastructure and connectivity to its only hub airport is key to maintaining its competitive edge and status as a leading global city for its residents, businesses, international investors, exporters, students and tourists.

¹ The European Commission, Aviation Strategy for Europe, December 2015

² <http://www.caa.co.uk/Data-and-analysis/UK-aviation-market/Airports/Datasets/UK-Airport-data/Airport-data-1990-onwards/>

About Heathrow

Heathrow Airport Limited owns and runs Heathrow Airport – the UK’s only hub airport. In 2014 73.4 million passengers and 1.50 million tonnes of freight passed through the airport – worth £101bn in value, making Heathrow the UK’s biggest port by value.

Heathrow is one of the UK’s largest transport hubs with the UK’s only dedicated non-stop express airport rail link, free travel zone, the UK’s busiest bus and coach station and the only airport served by London Underground, with four stations. Over the last 20 years passenger numbers have risen by almost 80% and yet airport related road traffic has remained broadly static. The number of passengers using public transport every year has nearly doubled from 10 million to 19 million and the proportion of our colleagues driving to work alone has fallen from 8 in 10 to just 5 in 10.

Introduction

Heathrow is submitting evidence to the National Infrastructure Commission’s call for evidence because we believe there is opportunity for the Government to prioritise certain infrastructure projects, particularly rail and domestic air links to the UK’s only hub airport – Heathrow – to benefit passengers, businesses, the environment and the UK’s economy not only in the north, but also for the rest of the UK and Greater London.

While this call for evidence is not looking at airport capacity or air quality issues, **strategic and sustainable connectivity to airports** – particularly the UK’s only hub airport, Heathrow – are areas of infrastructure that we believe the Government should prioritise to improve all of the UK’s connectivity, economic growth and maintaining London’s status as a leading global city.

1. Connecting northern cities

1. *To what extent are weaknesses in transport connectivity holding back northern city regions (specifically in terms of jobs, enterprise creation and growth, and housing)?*

Limited and indirect rail and air links between the North and Heathrow Airport are holding back the growth of northern city regions because ‘the world’s economic centre of gravity has shifted towards Asia.’³ Heathrow offers more direct and frequent flights to Asia because it is a hub airport. As a hub, Heathrow is different to other UK airports, because it can pool international, continental, domestic and local demand for leisure and business passengers as well as air freight, making direct flights to more cities around the world, particularly emerging markets, more commercially viable for airlines. It is critical that northern cities are well connected to Asia and the most viable way to do this is with better connectivity to Heathrow Airport.

While the National Infrastructure Commission is not looking at airport capacity, it is important the Commission notes the GDP and job benefits (outlined below) that an expanded Heathrow could bring northern city regions and the additional benefits that links to other infrastructure projects could also bring the North, for example linking HS2 and Crossrail 2 to Heathrow for northern passengers.

The independent Airports Commission produced an assessment of the economic benefits that would arise from airport expansion in terms of jobs and GDP (in Net Present Value). It also produced a broad breakdown of where in the UK the overall GDP increase effects will arise. These are presented for three broad regions (London & South East; Rest of England; and Rest of UK) for the scenario it defines as “Assessment of Need.”

Table 1: Present Value of regional real GDP impacts – Assessment of Need Scenario⁴

³ The European Commission, Aviation Strategy for Europe, December 2015

⁴ Source: Airports Commission, “Economy: Wider Impacts Assessment” Tables 18 & 36

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	Heathrow
London & South East	39.83%
Rest of England	43.78%
Rest of UK	16.39%

Source: Airports Commission, “Economy: Wider Impacts Assessment” Tables 18 & 36

Heathrow then commissioned Quod to do a further breakdown of the Airports Commission’s work to UK regions and converted the results to jobs based on GDP per worker. The Airports Commission estimates that the Heathrow North West Runway option would create an additional 179,800 jobs by 2050 under the Assessment of Need scenario. The estimated regional breakdown is as follows:

Table 2: Regional breakdown of jobs based on GDP per worker, controlled to AC estimates

	Heathrow	Gatwick
London	38,500	9,300
South East	33,200	8,000
London & South East	71,700	17,200
Yorkshire & Humber	11,300	3,500
North West	15,300	4,800
North East	5,100	1,600
East	12,900	4,100
East Midlands	9,800	3,100
West Midlands	12,000	3,800
South West	12,300	3,900
Rest of England	78,800	24,800
Scotland	16,100	4,100
Wales	8,400	2,200
Northern Ireland	5,000	1,300
Rest of UK	29,500	7,600
TOTAL	179,800	49,600

This table demonstrates the job benefits Heathrow expansion will bring northern cities and the significantly more jobs Heathrow expansion will bring the North compared to Gatwick. The difference in job numbers between expanding Heathrow versus Gatwick is attributed to the increase in manufacturing jobs and Heathrow is one of the UK’s most significant ports, moving the most freight by value in the UK. Heathrow is also the most important freight airport in the UK, moving more cargo than all other UK airports combined. In 2014 Heathrow moved nearly 1.5 million tonnes; followed by East Midlands International at 277,413 tonnes; Stansted 204,725 tonnes; Manchester 93,466 tonnes and Gatwick moving 88,508 tonnes. In terms of other northern cities, in 2014, 5,119 tonnes moved through Birmingham; 4,450 tonnes through Newcastle and 236 tonnes at Liverpool (CAA, UK Airport Freight Data, 1990 – 2014⁵, Refer to APPENDICES A & B). This demonstrates the importance of connectivity (rail and domestic flight links) to Heathrow for exporters in the North and indeed around the country.

⁵ <http://www.caa.co.uk/Data-and-analysis/UK-aviation-market/Airports/Datasets/UK-Airport-data/Airport-data-1990-onwards/>

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Again, while the Commission is not looking at airport capacity, it is important that the Commission notes the added benefits to the freight community when prioritising infrastructure projects, such as rail links to Heathrow, which generally brings significantly more benefits than any other airport.

HS2 provided a unique opportunity to deliver a properly integrated transport system with a direct connection to Heathrow. This could have been key to delivering benefits for passengers and achieving Government objectives for more sustainable travel, improving domestic and international connectivity, economic growth and carbon reduction. The Government initially supported a direct link to Heathrow on the basis that it would:

- a. Significantly enhance its accessibility by rail from the Midlands and the North;
- b. Provide new opportunities for growth and investment in those regions;
- c. Create a multi-modal transport 'hub' at the airport;
- d. Ensure that HS2 passengers would not have to change trains to access Heathrow;
- e. Incentivise further surface access investment at Heathrow; and
- f. Yield benefits right across the country.

However, the Government subsequently abandoned the proposals for a spur to Heathrow in early 2015, primarily on the basis that this was not considered necessary to support Heathrow's expansion. This unexpected decision represented a significant blow to regions in the Midlands and the North that could have benefited from direct rail connectivity to Heathrow, particularly where many domestic/ regional air connections have been lost. This is an example of how northern city regions will be disadvantaged through our inability to properly plan our major high speed rail network, despite some very clear strategic benefits. In the absence of a spur, a high quality interchange at Old Oak Common is essential.

Heathrow is currently the best connected airport by road in England. Based on ONS connectivity work, over 7m people have Heathrow as the airport with the shortest journey time by road. For Birmingham, London City and Manchester this figure is below 5.5m. For public transport, Heathrow is the airport with the quickest journey time for around 5.8m people. As you can see, there is a gap of more than a million people for whom Heathrow is the shortest journey by car, but not by public transport. Making public transport to Heathrow a more attractive option, with journey times competitive in comparison to those by private transport needs to be addressed so that passengers from all over the UK have different options available for accessing Heathrow.

The priority is for schemes to provide direct rail connectivity through the delivery of Crossrail, Western Rail Link and Southern Rail Access because 50% of surface access journeys to Heathrow have origin/destinations in London and a further 25% in the South East. However, over a million passengers a year currently travel from Scotland, Yorkshire & the Humber, North East and North West England via ground transportation to Heathrow. Those travelling by rail outside of London need to travel to Paddington, by London Underground or make use of one of the rail-air coach services, so Heathrow connectivity can still be improved for the rest of the UK. If the Government is serious about improving the growth of our regional cities, improving traffic congestion and reducing vehicle emissions, these passengers and their locations need to be served via key rail interchanges so that public transport options are at least as attractive to them as private transport options.

For example, York has excellent connectivity with London via East Coast Main Line and as a result the journey via rail to Heathrow is around 40 minutes shorter than the equivalent road journey. Derby, on the other hand, has a road journey which is almost half as short as the rail option (150 mins by car vs. 276 mins by rail). 54% of passengers arriving at Heathrow from York have done so by rail or tube, for Derby it is only 21%, which highlights the effect good rail links have on passengers' transport choice.

Only Leeds/Bradford, Manchester, Newcastle and Liverpool serve more direct passengers from The North than Heathrow does each year. Currently, twice as many passengers reach Heathrow by public transport from Scotland, Yorkshire & the Humber, North East and North West England than Gatwick (in 2014 657k vs. 327k respectively) more than Newcastle (504k in 2013) and almost as many as Liverpool (688k in

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2014). In fact only Manchester can boast significantly more passengers from the North arriving via public transport (3m in 2014).

The Piccadilly Line upgrade will increase line capacity by 60% through a new signaling system and trains allowing faster and more frequent services. While delivery timescales are yet to be finalised, this could provide up to 18 trains per hour serving Heathrow, compared to 12 trains per hour currently. This will improve the offering for passengers arriving at Heathrow from northern cities via London. Western Rail Link to Heathrow by National Rail's Control Period 6 will provide yet more integration to cities like Newcastle, Derby, Sheffield and Leeds via Reading.

The new HS2 interchange at Old Oak Common will be served by frequent Heathrow Express and Crossrail services, providing important connectivity to key cities in the Midlands and the North. This will transform Heathrow journey times for the North, bringing Birmingham within an hour of Heathrow and both Manchester and Leeds within around 90 minutes. This will make rail journey times to the airport significantly better than those by road and also avoids multiple interchanges through London by rail for passengers traveling from the North.

With these additional rail services in place, the number of trains per hour serving Heathrow would double by 2030 to 36 trains per hour with capacity increasing from around 5,000 seats per hour to almost 13,000. Improving rail connectivity to Heathrow will grow the number of people and businesses that can access Heathrow and its direct global connections. Heathrow's surface access strategy sees substantial increases in the number of people who could reach the airport by public transport. Shifting airport passengers from private cars to public transport will also free up capacity on the highway network and provide increased demand on public transport services throughout the day.

The Airports Commission concluded that better rail connections could bring 10 million people within three hours of the airport by public transport. In many locations this will mean that public transport is directly comparable or better than the alternative journey by road helping support the Government's objectives on modal shift and reducing road congestion and emissions for the UK.

Some of the key journey time savings for northern cities is summarised in the table below:

Station	2013		2032	
	Journey time	Interchanges	Journey time	Interchanges
York	3 hours 03 minutes	2	1 hour 52 minutes	1
Newcastle	4 hours 01 minutes	3	2 hour 54 minutes	2
Hull	3 hours 46 minutes	2	2 hour 51 minutes	1
Leeds	3 hours 30 minutes	2	1 hour 48 minutes	1
Liverpool	3 hours 29 minutes	2	1 hour 51 minutes	1
Manchester	3 hours 16 minutes	2	1 hour 28 minutes	1
Sheffield	3 hours 17 minutes	2	1 hour 39 minutes	1

These cities alone represent almost 500,000 pa direct passengers accessing Heathrow via ground transport today.

2. *What cost-effective infrastructure investments in city-to-city connectivity could address these weaknesses? We are interested in all modes of transport.*

The Commission should note that it is not just city-to-city connectivity that could address these weaknesses, but also city-to-airport connectivity. Strategic connectivity to airports is important because as recognised in the European Commission's new European Aviation Strategy 'studies show that the better a city, region or country is connected by air to other destinations in Europe and other parts of the world, the more growth can be generated.' The Commission's new Strategy also recognises aviation and airports as 'strong drivers of economic growth, jobs, trade and mobility for the European Union' – and hence has listed 'tackling limits to growth in the air and on the ground by reducing capacity constraints and improving efficiency and connectivity' as one of its three key priorities. The surface access network connects people and freight to Heathrow, the UK's only hub airport. It generates economic growth by helping UK businesses connect with existing and emerging markets. Research shows there is a strong link between a passenger's surface access experience⁶ and their overall satisfaction with Heathrow. It is also a main influence on their choice of airport (CAA passenger choice report from 2011 pg. 20-21)⁷. Since passengers value reliable, convenient, direct and frequent services, we have to make sure that Heathrow's surface access meets the needs and expectations of its users.

3. *Which city-to-city corridor(s) should be the priority for early phases of investment?*

In terms of city-to-city connectivity, it is in the Government's gift to review and implement Public Service Obligations and protect domestic UK air links.

That said, connections to London Heathrow should be prioritised because Heathrow is one of the UK's most significant ports, moving the most freight by value in the UK. Heathrow is also the most important freight airport in the UK, moving more cargo than all other UK airports combined (CAA, UK Airport Freight Data, 1990 – 2014⁸, Refer to APPENDICES A & B).

4. *What are the key international connectivity needs likely to be in the next 20-30 years in the north of England (with a focus on ports and airports)? What is the most effective way to meet these needs, and what constraints on delivery are anticipated?*

One of the key international connectivity needs in the next 20-30 years in the North, which was recognised in the European Commission's recently launched European Aviation Strategy is 'the shift of the world's economic centre of gravity towards the East, notably Asia'⁹ and how the North will connect to the East. As outlined in our response to Question 1, Heathrow offers more direct and frequent flights to Asia because it is a hub airport and as a hub airport, Heathrow is different to other UK airports, because it can pool international, continental, domestic and local demand for leisure and business passengers as well as air freight, making direct flights to more cities around the world, particularly emerging markets, more commercially viable for airlines. Therefore with the global shift to the East, it is critical that northern cities are well connected to Asia and the most commercially viable way to do this to benefit the UK economy is through better connectivity to Heathrow airport.

That said the UK's regional airports play an important role in connecting regional city regions, but they play a different role to Heathrow. Regional airports have capacity and can provide services where there is direct demand. Otherwise access to a hub airport by surface transport or air is critical to satisfy the region's complete connectivity needs. Therefore surface access to airports and to Heathrow via air and rail are the most effective ways to meet future connectivity needs.

⁶ Heathrow Passenger Survey data QSM scores

⁷ https://www.caa.co.uk/uploadedFiles/CAA/Content/Standard_Content/Data_and_analysis/Analysis_reports/Passenger%20choise%20and%20information%20use%20-%20consumer%20research%20-%20produced%20by%20Accent%20for%20CAA%202011.pdf

⁸ <http://www.caa.co.uk/Data-and-analysis/UK-aviation-market/Airports/Datasets/UK-Airport-data/Airport-data-1990-onwards/>

⁹ The European Commission, Aviation Strategy for Europe, December 2015

2. London's transport infrastructure

1. *What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?*

As mentioned in section 1, with the global shift to Asia, London's status and its continuing success as a global centre for business is critically dependent on the quality of its international connectivity, as well as its local transport infrastructure. London is expected to see major population growth, but it is in competition with other cities around the world, so investing in London's transport infrastructure and connectivity is key to maintaining its competitive edge and status as a leading global city for its residents, businesses, international investors, exporters, students and tourists.

Demand for connectivity to Heathrow and the capacity of the UK's only hub airport are only going to increase with London's growing population. According to the Greater London Authority, London's population is currently around 8.6m people. The middle estimates for the population in 2050 are around 11m. With over 14m people living in the London commuter belt area, it is essential that people who wish to work and live in London are well connected to all parts of the capital, the South East England, the UK and to the rest of the world.

Heathrow airport obviously plays a significant role in connecting London to the world and the world to London, but it is also a major employer and driver of job creation across the capital. For many local commuters Heathrow is not at the end of the Piccadilly Line, it is at the start and enables them to access London and the associated job market. Similarly, Heathrow Connect and in the future Crossrail will play an important role in empowering airport related workers to make public transport journeys from West London. The Office of National Statistics work on Travel To Work Areas based on the 2011 census has shown that Heathrow and Slough were designated as a separate TTWA, rather than being spread between London and Thames Valley areas. This is against a trend of these areas growing and swallowing up areas due to more concentrated economic activity and a trend to longer commutes to work over the previous decade.

2. *What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?*

- *How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?*
- *What might their potential impact be on employment, productivity and housing supply in London and the southeast?*

One of the strategic options for future investment in large-scale transport infrastructure improvements in London is in improving Heathrow's connectivity to the wider rail network to ensure that London and the wider South East can benefit from and fulfil Heathrow's global hub route network, taking advantage of the interchange opportunities provided at Heathrow.

The key rail priorities for Heathrow are:

- Crossrail
- Western Rail Access
- Southern Rail Access
- Piccadilly Line upgrade
- HS2

Investment in rail to Heathrow is supported by Network Rail's 2013 London & South East Market Study, which notes how good rail connectivity to airports is important in supporting economic growth, productivity and social mobility and plays a key role in providing better access to markets,

national and international destinations, business and leisure opportunities, and to jobs. It confirms that integrating new and improved rail services with other transport modes at major airports is key to delivering sustainable travel opportunities and improving overall connectivity. The study recommends that rail services should provide for the growing demand to access airports by rail, with fast, convenient and reliable rail access to central London a priority for London's airports but direct access to non-London core economic centres both long-distance and within the London and South East area increasingly important.

In the future Heathrow will provide direct terminal access to passengers from every mode of transport. They will be connected to the Underground network and have fast dedicated rail services to London provided by Heathrow Express. In 2019 Crossrail will link Heathrow to the City, Canary Wharf and East London. Western Rail Access will provide fast direct services to the West and South Wales. Southern Rail Access will connect Heathrow to Waterloo and the South and South-West mainlines. In 2026 the new HS2 rail line will provide fast access to Heathrow from the Midlands and the North by 2030.

The transport improvements already committed plus those planned can transform Heathrow into a fully integrated national transport hub that offers connectivity benefits for the local area and the rest of the UK. Heathrow will be a vital component of the national transport system and provide new direct transport links for local communities.

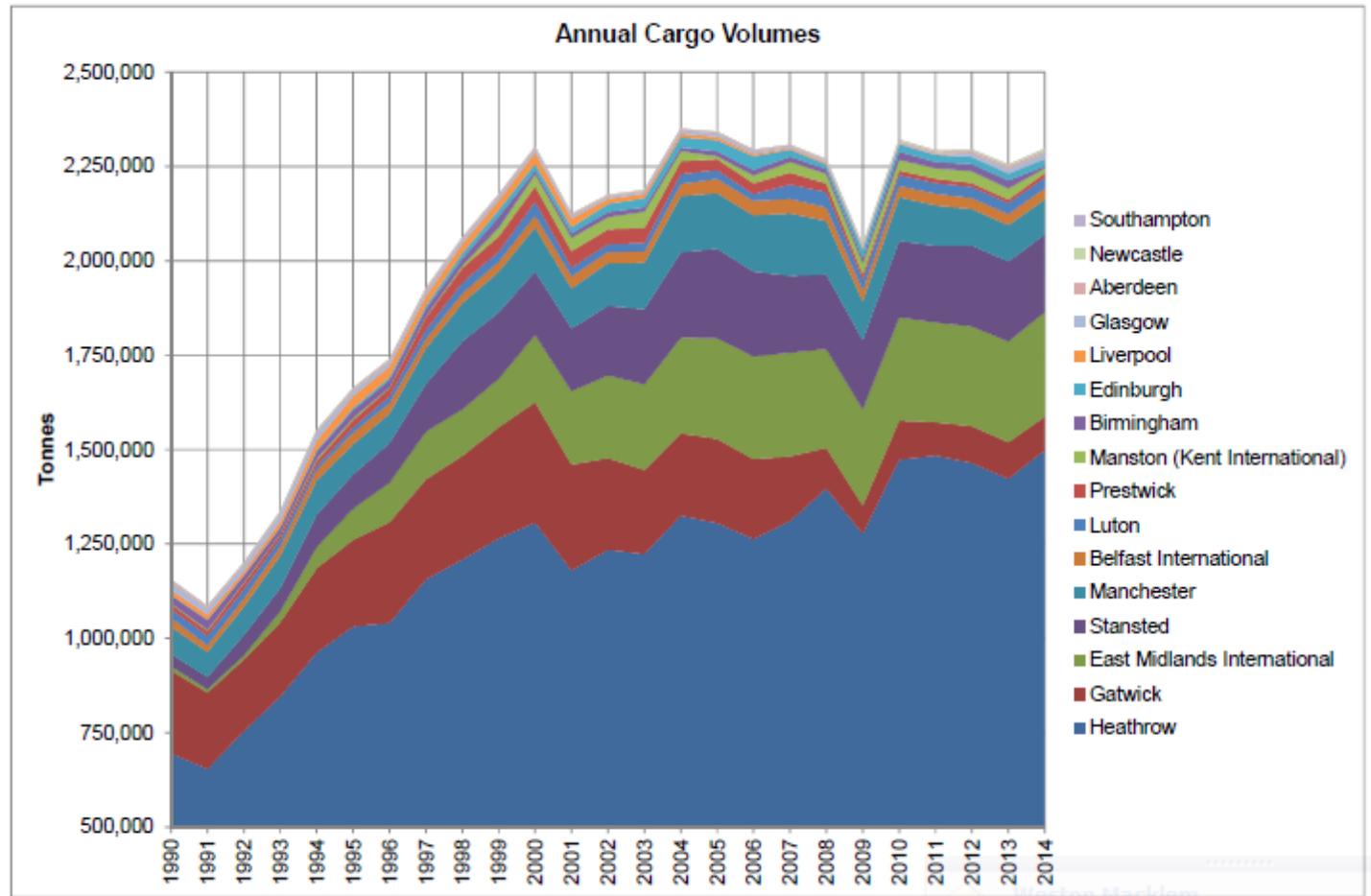
Increasing the modal shift onto public transport is also another priority for Heathrow. Heathrow's public transport improvements will increase transport resilience and give passengers, colleagues and members of the public choice. This is why we believe that projects like Crossrail, Western Rail Link and Southern Rail Access are essential, not just for Heathrow, but for the surrounding areas. Providing this infrastructure will increase public transport mode share, reducing the negative impacts on the local environment from car journeys such as traffic and emissions.

Southern Rail Access will also provide choices, by rail, for the large swath of Heathrow's passengers who live in South West London that don't rely on a journey into and out of central London. Western Rail Link will do likewise for the population to the west of the airport. While Crossrail 2 is not directly linked to Heathrow, enabling it to connect smoothly and quickly with Crossrail, Southern Rail Access and the existing rail and underground networks will mean more and more people are able to get to Heathrow more quickly and conveniently, whether they are coming across London or through it.

These, again, are good for the passenger, the local areas and the country as a whole. Planning and investment in progressing these strategic links to Heathrow should be a high priority in London's infrastructure improvements.

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APPENDIX A: CAA, UK Airport Freight Data, 1990 – 2014¹⁰



¹⁰ <http://www.caa.co.uk/Data-and-analysis/UK-aviation-market/Airports/Datasets/UK-Airport-data/Airport-data-1990-onwards/>

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APPENDIX B: CAA, UK Airport Freight Data, 1990 – 2014¹¹

Tonnes	Pax Aircraft					Freighters					Total				
	1990	2000	2005	2010	2014	1990	2000	2005	2010	2014	1990	2000	2005	2010	2014
Heathrow	606,066	1,208,924	1,227,836	1,398,369	1,424,270	89,281	97,983	77,850	74,619	74,636	695,347	1,306,907	1,305,686	1,472,988	1,498,906
Gatwick	193,736	289,209	169,000	102,454	88,506	26,355	29,753	53,779	1,577	3	220,091	318,962	222,778	104,032	88,508
East Midlands International	1,198	145		143	34	9,918	178,624		273,526	277,378	11,116	178,769		273,669	277,413
Stansted	261	2,802	1,347	1,911	1,185	32,266	165,021	235,698	200,328	203,540	32,527	167,823	237,045	202,238	204,725
Manchester	30,329	73,520	76,246	69,131	82,941	41,927	43,497	71,238	46,791	10,525	72,255	117,017	147,484	115,922	93,466
Belfast International	3,207	4,054	368	189	45	20,513	26,845	37,509	29,527	30,028	23,720	30,899	37,878	29,716	30,073
Luton	2,206	768	497	932	632	20,412	35,353	22,611	27,811	26,782	22,619	36,121	23,108	28,743	27,414
Prestwick	997	224	53	44	14	12,643	41,236	29,147	12,119	12,525	13,640	41,460	29,199	12,163	12,540
Manston (Kent International)				0	0				28,103	12,696				28,103	12,696
Birmingham	4,282	7,915	11,694	19,408	5,119	16,999	1,781	1,245	2,197	0	21,281	9,696	12,939	21,605	5,119
Edinburgh	916	2,192	485	339	203	241	16,088	29,110	20,018	19,166	1,157	18,280	29,595	20,357	19,369
Glasgow	7,612	8,331	7,967	2,762	14,623	11,186	469	766	151	788	18,798	8,800	8,733	2,914	15,411
Aberdeen	5,862	3,314	2,487	1,458	2,864	505	1,250	1,602	2,752	3,415	6,367	4,564	4,089	4,211	6,278
Newcastle	606	308	129	3,468	3,681	189	218	70	183	769	795	526	199	3,650	4,450
Southampton	975	253	203	116	131	154	6	1	0	3	1,129	259	204	116	133

¹¹ <http://www.caa.co.uk/Data-and-analysis/UK-aviation-market/Airports/Datasets/UK-Airport-data/Airport-data-1990-onwards/>



Heathrow Hub Ltd response to the National Infrastructure Commission's Call for Evidence

8th January 2016

Introduction

Heathrow Hub Ltd. is pleased to respond to the Commission's call for evidence on London's transport system, and the strategic options for future investment in large-scale transport improvements.

We are the promoter of one of the three schemes for airport expansion shortlisted by the Airports Commission and currently being considered by Government.

We suggest that the Commission considers London's transport system as part of a wider regional network. We believe that London, in its narrowest geographical sense, cannot be considered in isolation if the objective is to achieve the most economically, socially and environmentally effective and efficient overall system.

Investment in large-scale transport infrastructure improvements in London

Government has directed that the Commission is not to consider issues relating to airport capacity, stating "*the Davies Commission has already examined this issue in detail.*" However we believe the critically important issue of airport surface access should not be separated from wider considerations of London's transport network.

Heathrow suffers from poor rail connectivity compared to its major competitors, and passenger numbers will continue to grow as airlines optimise scarce capacity through use of larger aircraft. DfT forecasts terminal passenger numbers will increase in a two- runway constrained airport, from 73m in 2014¹ to c.93m by 2050.² An additional runway, if approved by Government, is forecast to increase Heathrow's terminal passengers to 170m by 2050.³

Roads are increasingly capacity constrained and background growth in rail demand places growing stress on the rail network. Separate consideration of airport and non-airport connectivity is unlikely to achieve the most efficient outcome.

Heathrow Express shows why an integrated strategy is needed. Using 20% of the Great Western Main Line's (GWML) constrained capacity, and scarce platform capacity at Paddington, it achieves a

¹ <http://www.heathrow.com/company/company-news-and-information/company-information/facts-and-figures>

² Annex E2 Terminal Passenger Forecasts (constrained), UK Aviation Forecasts DfT January 2013
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/223839/aviation-forecasts.pdf

³ Annex D8 ibid

very low load factor of c30% in the critical three-hour morning peak, at a time when other GWML services are operating at or above 100% capacity.⁴

As well as being inherently inefficient, this form of dedicated airport service fails to provide the best possible service for air passengers. European experience at for example Schiphol, Frankfurt and Charles de Gaulle shows that airports which are instead served by through stations on main lines provide air passengers with very high frequency services to a wide range of destinations.

Other passengers also benefit from the additional network capacity that would otherwise be inefficiently used by dedicated airport services. This is highly relevant to Government's request that *"the Commission should consider relevant international experience in major metropolitan areas, to review how other cities have responded to similar challenges and priorities, and whether there are any lessons to be learned and applied in London."*

The proven European approach has now been adopted in part for the similarly capacity constrained Brighton Main Line, where Gatwick Express services also serve Brighton in the peaks.

However, plans for dedicated airport services over a new Western Rail Access to Heathrow (WRAtH) continue to be progressed, despite the Airports Commission's analysis showing that such dedicated airport services from Reading and intermediate stations would have extremely low load factors⁵ as a result of slow journey times and the need for most passengers from the west to change trains at Reading.

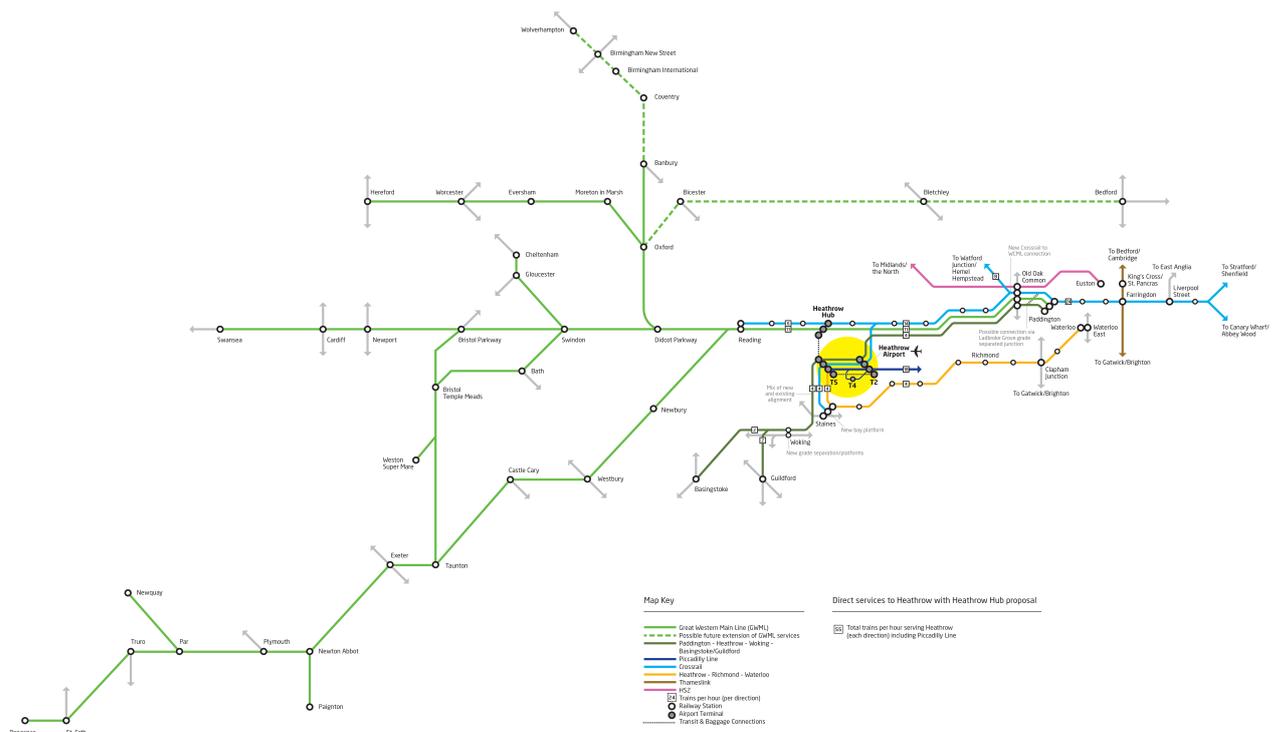
This is relevant to the Commission's consideration of London's rail network. WRAtH requires significant (4tph) capacity on the Great Western Relief Lines which, together with the need to retain and potentially increase freight paths, will act as a considerable constraint on Crossrail and prevent this very large investment from maximising its potential to the West of London. The proposed relocation of Heathrow Express's depot to Langley as part of the HS2 scheme may further exacerbate these capacity challenges, (with the additional risk that the depot could be redundant after expiry of Heathrow Express's Track Access Agreement in 2023).

Our alternative innovative and integrated approach to Heathrow's rail connectivity has two major benefits.

- It provides benefits to both airport and non-airport users, in line with Government's recognition of the need to *"consider the relative importance of, and trade-offs between, capacity, reliability, journey times and connectivity to markets"* and;
- It has a relatively low capital cost and high revenues, (as well as delivering very substantial wider economic and environmental benefits) and is therefore capable of being entirely financed by the private sector. This meets the Government's objective of *"funding and financing (infrastructure) in a way that minimises the tax payer burden."*

⁴ Table 4.2, London and South East Route Utilisation Strategy, Network Rail July 2011

⁵ "A four train per hour service would have spare capacity with the busiest sections reaching 31% of seat capacity but reducing to as little as 16% of hourly seated capacity (and 6% of hourly total capacity) at the Reading end of the WRAtH route" - Para 4.7.8, Surface Access: LHR-NWR, Jacobs for Airports Commission, November 2014



Our proposals comprise two principal elements.

1 - Heathrow Hub interchange

This road and rail interchange provides a new airport entry point and passenger processor, located on a largely unconstrained and readily developable 200 acre site c.4km north of Heathrow T5, on the Great Western Main Line (GWML) between Iwer and West Drayton stations where it crosses the M25. Fast passenger transit and baggage connections link the interchange directly to the airport campus, providing options for airside, landside or combined systems.

The station layout allows all GWML trains to call, with through lines allowing the option of Main Line non-stopping trains to pass at line speed. The station also effectively provides a dynamic loop on the Relief Lines in each direction, which, with its location roughly mid-way between Reading and Paddington, allows a new “Crossrail Express” service pattern west of Paddington. This, stopping only at Heathrow Hub and Reading, would be highly attractive to Reading passengers, incurring only a 8-10 minute journey time penalty compared to existing GWML services between Reading and Paddington.

This penalty would be more than offset by enabling passengers to avoid the need to interchange to Crossrail at Paddington. The likelihood that Crossrail will be integrated into TfL’s zonal fares structure also makes this an attractive alternative to existing GWML services, freeing these from the constraints imposed by their currently attempting to serve both commuter and long distance markets. The cross-platform interchange between stopping and express Crossrail services at the Hub would also reduce journey times for passengers from intermediate stations.

Current plans envisage 14 of the peak 24tph Crossrail service from the East turning back West of Paddington.⁶ With our proposal the extension of Crossrail to Reading allows a service pattern that unlocks the project's full potential and maximises the very considerable investment in this new infrastructure.

The Airports Commission also recognised the potential for the Hub interchange to provide air quality⁷ and road decongestion benefits⁸ as a result of dispersing road traffic entry points to the airport – an example of the benefits of an integrated, multi-modal approach to transport infrastructure planning.

2 - Southern Rail Access

This consists of two separate but related service groups.

The first, an amended version of BAA's former Airtrack scheme, provides direct services from London Waterloo to Heathrow via Clapham Junction and Richmond using a section of new rail infrastructure North of Staines between the Windsor Lines and Heathrow. We propose this would also be used by Crossrail, extending currently planned Heathrow services to terminate in a new bay platform at Staines to provide connectivity with currently un-served South Western catchments.

The second is a fast rail link from Woking to Heathrow, with trains from the South operating over a further new section of railway South of the junction with the Windsor Lines, twinned with the M25 motorway corridor and continuing through Heathrow, using the existing Heathrow Express paths, to Paddington. This overcomes the problems that contributed to the failure of Airtrack, including uncompetitive journey times and extended level crossing barrier downtime.

These combined proposals provide major benefits, those relevant to the Commission including:

- Direct trains to Paddington from the South and South West, providing an alternative London terminal with Crossrail providing excellent connections to the West End, the City and Docklands.
- Significant crowding relief to the South Western Main Line (and the LUL network at Waterloo for onward journeys). The density of operation on the Up Fast Line from Surbiton during the peak is higher than on any other single stretch of main line in the UK and Network Rail's Wessex Route Study forecasts a need for an additional 60% capacity in the high peak hour by 2043.⁹

⁶ <http://content.tfl.gov.uk/rup-20150212-part-1-item-09-crossrail.pdf>

⁷ The proposed Hub interchange "could potentially produce air quality benefits by bringing traffic off the M4 and M25 before reaching Heathrow" - Para 8.16 Final Report, Airports Commission July 2015

⁸ "The Hub has the potential to intercept traffic flows destined for Heathrow from the north and west, reducing pressure on already congested sections of the M4 and M25, plus the local roads approaching the terminals. Jacobs traffic analysis provides evidence that the approach reduces pressure on M25 junction 15, with lower peak hour flows approaching from all directions" - Para 5.3.2, Appraisal Framework Module 4, Surface Access: Heathrow Hub Station Analysis Compendium, Jacobs May 2015

⁹ "An additional 60 per cent capacity is required in the high-peak hour to meet the 2043 capacity conditional output for Main Line long distance services (conditional output CO3). This implies a need for more than 150 extra passenger vehicle arrivals at London Waterloo during the high-peak hour, which is equivalent to an additional 13 paths (assuming 12-car 20 metre vehicles configured with 3 + 2 seating in standard accommodation)" – Para 4.2.44, Wessex Route Study, Network Rail August 2015

- Significant crowding relief to LUL services at Waterloo.
- Maximising effectiveness of Crossrail investment.

More radically, this proposed service pattern could take advantage of the possible intervention identified in Network Rail's Western Route Study of a new grade - separated junction in the Ladbroke Grove area in CP6 alongside a rationalisation of the Paddington approaches.¹⁰ Subject to the detailed design of the junction, it is possible that this would allow Woking/Heathrow services to run on the Great Western Main Lines from Airport Junction, using existing Heathrow Express paths, before crossing to the Relief Lines to continue through the Crossrail central London tunnel. This would dramatically improve London's connectivity whilst also releasing valuable platform capacity at Paddington.

We commissioned modeling from AECOM (formerly URS), using, with their agreement, HAL's "LASAM" and TfL's "Railplan" models.

The results indicated an average peak loading of around 387 passengers per train between Woking and Heathrow (around 60% of capacity), the majority of whom are forecast to transfer from Waterloo services. This provides significant and highly desirable direct relief to the South Western Main Line and the LUL network serving Waterloo.

The trains would be at around 100% of capacity between Heathrow and Old Oak Common – compared with c30% for Heathrow Express currently, thus delivering effective use of scarce line capacity.

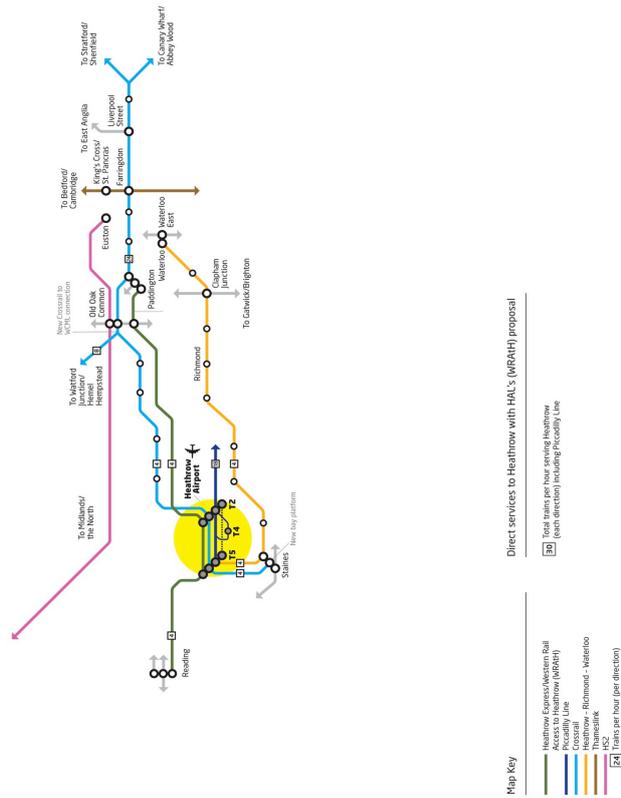
Conclusion

We believe our proposals provide overwhelming benefits and, critically at a time of constraints on public expenditure generally and on rail enhancements in particular, are capable of being privately funded.

Our proposals have been developed with a world class team of expert consultants including AECOM, Gardiner & Theobald and First Class Partnerships and in liaison with Network Rail and TfL. Heathrow Hub Ltd has also participated as a full member in Network Rail/DfT's Southern Rail Access Working Group, the report of which is due to be published shortly.

We believe it is helpful to compare our integrated proposals with the alternative rail schemes that are being separately brought forward.

¹⁰ "Grade separation of Ladbroke Grove Junction would increase the capability of the whole system, reducing the level of conflicting train movements creating greater timetable capability, increasing flexibility in the platforming and operation of services using London Paddington and associated depots"- 05, Western Route Study, Network Rail August 2015



In contrast, the current uncoordinated plans for Heathrow Express, WRAtH and Crossrail achieve far fewer benefits at a high cost to the public purse, deliver a lower overall return on investment and, in the case of WRAtH, are likely to require ongoing revenue support.

We have deliberately made this submission as brief as possible but would of course welcome the opportunity to engage with the Commission to discuss our proposals in greater detail.

Contact

Steve Costello, Director Heathrow Hub

Ltd

[email and telephone number redacted]

National Infrastructure Commission call for evidence: 'London's transport infrastructure'

Evidence submitted by the iBUILD Infrastructure Research Centre,
January 2016

Introduction

The iBUILD (Infrastructure **B**usiness models, valuation and **I**nnovation for **L**ocal **D**elivery) Infrastructure Research Centre brings together a multi-disciplinary team from Newcastle, Birmingham and Leeds Universities to improve the delivery of local and urban infrastructure. iBUILD is developing and demonstrating alternative infrastructure business models that: take a whole life cycle view of infrastructure systems; exploit technical and market opportunities from modern interconnected infrastructure; leverage economic, social, environmental, aesthetic and other values from infrastructure; identify changes in governance, regulation and policy to unlock improvements; and, use innovative financing and funding mechanisms.

iBUILD promotes a service and system-wide approach to local and urban infrastructure, believing that there are significant advantages to be gained from planning, investing and managing infrastructure on an interdependent basis. As the recent floods in Cumbria, Northumberland and elsewhere in the north of England demonstrated, long-term resilience should be built into the UK's infrastructure sectors and systems. Otherwise, the potential economic and social benefits that can be derived from infrastructure investment will be marginal compared to the economic, social and environmental costs of repairing infrastructure that is damaged or destroyed by adverse (but increasingly regular) weather-related events.

The emergence of the National Infrastructure Commission (NIC) reflects the recent emphasis towards national scale infrastructure planning in the UK, and provides an important strategic context for the planning, development and operation of infrastructure. However, it is also important to consider the distinct role of local and urban infrastructure in driving local, regional and national economies. It is at the local and urban scales where infrastructure services are most dense and where the majority of people use infrastructure services in their everyday lives. Balancing growth across different geographical scales – from the local to the city/city-region – is vital to the long-term success of the national economy, as infrastructure drives local economic growth and job creation, as a consequence of construction and management activities as well as the enhancement and facilitation of other economic activities.

The response below first summarises key findings from our research programme that are relevant to all infrastructure delivery, before specifically responding to the consultation questions. Our response draws predominantly on new research identified during the iBUILD project, but also decades of research and experience in the iBUILD team. This includes engineering expertise in the Centre for

Earth Systems Engineering Research (CESER)¹ and the Institute for Resilient Infrastructure (IRI)², and the long-standing track record in local and regional development by the Centre for Urban and Regional Development Studies (CURDS).³

iBUILD focuses on all infrastructure sectors, not just transport, but our work has also drawn lessons from non-infrastructure sectors. Where our research is undergoing external peer review we cite working papers which, amongst other work, can be found at www.ibuild.ac.uk.

iBUILD Mid-Term Review and Policy Manifesto

In March 2015, iBUILD published a mid-term review and manifesto setting out thirteen evidence-based policy recommendations on how local and urban infrastructure business models could be strengthened in both design and in application. The key recommendations are elaborated in the full manifesto document which is available online.⁴

Research from across the iBUILD Centre has identified five priority action areas for government and industry. If applied to all infrastructure planning and decision-making, these action areas will help to challenge the “timid, uncoordinated, incremental, wasteful”⁵ way the UK currently builds and manages its infrastructure, and help to develop a new approach to delivering infrastructure systems and their services that will enhance the health, wealth and security of UK citizens.

Priority Action Area #1: Have a broader, integrated appreciation of infrastructure

Infrastructure is not just tracks, tubes and trunk roads. Failure to consider the resources that flow along these, the services they provide and the people and businesses that depend on them, will lead to investments that don't deliver effectively. At the same time, it is crucial to understand how all these systems are interconnected; infrastructure depends on other infrastructure to work, not just technically, but also economically and socially. The UK's infrastructure is amongst the most mature and interconnected in the world and therefore has a pressing need to adopt a broad, integrated and sophisticated approach to infrastructure planning.

Recommendation 1: Infrastructure planners, financiers, engineers and other stakeholders need to use a broad, but appropriately specified, definition of infrastructure if they are to identify the full range of opportunities from alternative business models.

Recommendation 2: Housing and ‘hidden infrastructure’, such as efficiency measures, should be considered alongside the large-scale capital investments with which they interconnect, within infrastructure and spatial planning processes

¹ www.ncl.ac.uk/ceser

² <https://www.engineering.leeds.ac.uk/resilience/>

³ www.ncl.ac.uk/curds

⁴ iBUILD (2015) *Are you being served? Alternative infrastructure business models to support economic growth and well-being*, iBUILD Manifesto and Mid-term Report, Newcastle University: Newcastle upon Tyne. The full manifesto can be downloaded from <http://research.ncl.ac.uk/ibuild/outputs/>

⁵ Infrastructure UK (2010) *National Infrastructure Plan 2010*, First NIP: October 2010, HM Treasury.

Recommendation 3: National reforms in policy and regulation are required to enable an integrated approach to local infrastructure planning that can identify, and has the capacity to exploit, synergies across infrastructure sectors.

Priority Action Area #2: Enable action at the local scale that connects with the national

Too much infrastructure planning is top-down, yet every piece of infrastructure has to go somewhere; it is inherently local. Top-down approaches to infrastructure development and management stop locally-led and innovative business models from flourishing and discourage innovation. It also risks the wrong infrastructure being put in the wrong place at the wrong time because of a lack of local knowledge, engagement and ownership. These issues prevent the UK from maximising returns from infrastructure investment. The UK must devolve an appropriate and sensible proportion of infrastructure investment and responsibility to local institutions so they can deliver infrastructure that better reflects the values and needs of the communities it serves, yet remain mindful of the national strategy.

Recommendation 4: National and local policy frameworks should be realigned to focus on delivering wider societal benefits and to enable local infrastructure business models to emerge that can provide local solutions that are complementary with mainstream systems.

Recommendation 5: Effective operation of local alternative infrastructure business models requires greater fiscal decentralisation, complemented by a stronger and statutory devolved role for cities and localities in the planning, development and delivery of infrastructure.

Recommendation 6: Provide support for a wider range of innovative local infrastructure financing mechanisms, including tax increment financing, municipal bonds, social impact bonds and crowd source funding approaches.

Priority Action Area #3: Capture long-term value of every kind

Infrastructure is not only about cash returns. Investment in infrastructure provides wider health, economic and environmental benefits for society; infrastructure converts financial value to social value. A new economic valuation system that recognises these long-term, whole-life benefits is essential to maximise the benefits. Infrastructure must also be built for minimum whole-life costs. This might mean paying a bit more upfront for something that will last – and serve – for longer without the need for frequent maintenance; a resilient and sustainable infrastructure.

Recommendation 7: Incorporate measures of social and environment benefit (and cost) into infrastructure appraisal frameworks to recognise the wider societal and environmental outcomes and ascertain the widest possible set of mechanisms to capture revenue and other values.

Recommendation 8: Implement a quantitative framework within the infrastructure appraisal process to assess the value of flexibility and resilience across the whole system over the long-term.

Recommendation 9: Local authorities and infrastructure owners should apply resource assessments as a matter of course to identify the potential of land and infrastructure assets to generate long-term, stable revenue streams and not just one-off, short-term windfalls from selling-off assets.

Recommendation 10: Employ a new approach to infrastructure economics that recognises the long-term and system-wide value of infrastructure provision.

Priority Action Area #4: Deliver more efficient planning, procurement and delivery

Approaches to project financing, funding and delivery should not be chosen for political reasons. Mechanisms must be adopted that can best deliver the desired economic, social and environmental values, regardless of their political flavour. Many of methods and tools to enable this already exist: the Project Initiation Routemap, Building Information Modelling (BIM) systems, life-cycle assessment, so they must be used. These approaches support more efficient planning and procurement, minimise costs and human effort, preserve the environment, and maximise the potential to reuse and recycle materials and components in the future.

Recommendation 11: Implementation of the Project Initiation Routemap has been shown to have many cost reduction benefits and should be made standard practise for all public funded projects.

Recommendation 12: Planning and design of infrastructure should consider the material and resource demands of infrastructure pipelines to identify opportunities for reducing waste in the construction and operation phases, whilst designing for end of life material recovery or repurposing of infrastructure.

Priority Action Area #5: Accelerate the uptake of innovations through practical action and demonstration

Action often speaks louder than words. Alternative approaches to infrastructure business models are emerging. However, to quickly identify the most successful approaches and encourage their wide uptake locally, nationally and internationally, a number of ambitious demonstrator sites should be established for integrated infrastructure planning and testing of innovative infrastructure business models.

Recommendation 13: Establish full-scale urban demonstrator sites for integrated infrastructure planning and testing of innovative infrastructure business models.

1. What are the major economic and social challenges facing London and its commuter hinterland land over the next two to three decades?

Key messages:

- *As with all UK cities, London faces significant economic, social and environmental challenges over the coming years. Population growth, in absolute and relative terms, poses a particularly significant challenge in London and the wider city region.*
- *Governing and planning for growth and meeting future challenges, in London and the wider city region, requires effective institutional and administrative co-ordination between the Mayor of London, Greater London Authority and local authorities in the south east of England.*
- *No strategy will tackle all the challenges, and trade-offs between planning and infrastructure choices are inevitable. However, redressing the London-rest of UK balance by stimulating growth elsewhere will help alleviate many of these pressures in London.*

iBUILD researchers have been examining the governance of infrastructure funding and financing in the London mega city-region. Interviews undertaken as part of the study have sought to identify the major economic, social and environmental challenges facing London in relation to infrastructure.⁶ The overwhelming majority of interviewees have stated that the fundamental challenge facing London is how to ensure that there is adequate housing, transport, water, energy, communications and other infrastructure to accommodate and absorb the significant population growth that has taken place, and is projected to occur, within the administrative boundaries of London and the broader city region. In one interview, a stakeholder suggested that:

“Population growth requires the opening up of new locations for housing growth. There could also be the opening up of existing residential areas. All the accompanying infrastructure that is required to enable housing growth to be sustained is the number one challenge.”

Dealing with the implications of population growth poses profound questions about the planning, governance, funding, financing and operation of infrastructure across and within the London functional economic geography. There is limited, if any, formal strategic planning activity across the functional city-region, and there are noticeable differences in the institutional capacity, statutory responsibilities and funding of the Greater London Authority (GLA), London Boroughs and individual local authorities and Local Enterprise Partnerships (LEPs) in the south east of England outside London. The limited strategic planning capability at the interface of these organisations makes the case for long-term planning and securing public and private (particularly international) investment in infrastructure problematic. The Mayor of London, GLA and South East local authorities and LEPs are

⁶ Stakeholder organisations that have taken part in the iBUILD research, include: the Greater London Authority; Transport for London; London First; and the Department for Transport.

attempting to overcome these spatial challenges by working through a new voluntary ‘wider south east summit’ framework. These arrangements could offer some scope for project or programme-based ‘deal-making’ between different local authorities in the city region in an attempt to plan urban development collaboratively and to use geographical scale as a means of generating new investment and attracting private sector contributions in infrastructure in London and the wider South East. Continued institutional ‘reform’, in an attempt to overcome local administrative fragmentation, and improve urban economic performance⁷ is a noticeable feature of how many global cities are governed.⁸ The recent establishment of *Métropole du Grand Paris*, as well as current plans to manage the delivery of spatial and economic strategies within and across the Sydney ‘city-region’, illustrate how local and national actors continually attempt to co-ordinate and ‘improve’ the governance of large metropolitan areas.⁹

The other major economic and social challenges facing London and the wider city-region, include:

- Improving transport mobility and accessibility for people in London and the wider city region, for work and leisure purposes.
- For many employers, the issue of housing is of heightened significance because of the affordability crisis and some of the difficulties that companies face in recruiting and retaining staff in London. Ensuring that ‘doing business’ in London remains a viable proposition for international and national firms, which means preventing the cost of business (in terms of commercial rents) from becoming prohibitive.
- Providing sufficient brownfield sites in London and the wider city region for commercial and residential use, and that GLA, London Borough and local authority statutory plans are aligned and there is agreement upon what development is built where.
- Tackling poverty and low wages in London, and ensuring that transport infrastructure supports affordable access to job and training opportunities and addresses and does not exacerbate the problem of rising inequality in different parts of the city and city region.
- Managing the growing demand for health and social care services, as well as ensuring there is ‘quality’ early years and post-16 education for children and young adults.
- Creating and maintaining sufficient green spaces to underpin and support greater social equality and improved individual and collective environmental health and well-being.
- Addressing poor air quality and environmental degradation.
- Improving water quality and maintaining the effectiveness of flood defences.

⁷ Ahrend, R., Farchy, E., Kaplanis, I. and Lembcke, A. C. (2014) ‘What Makes Cities More Productive? Evidence on the Role of Urban Governance from Five OECD Countries’, *OECD Regional Development Working Papers*, 2014/05, Organisation for Economic Cooperation and Development: Paris.

⁸ Storper, M. (2014) ‘Governing the Large Metropolis’, *Territory, Politics, Governance*, 2(2): 115-134. Katz, B. and Bradley, J. (2013) *The Metropolitan Revolution: How Cities and Metros are Fixing our Broken Politics and Fragile Economy*, Brookings Institution Press: Washington D.C.

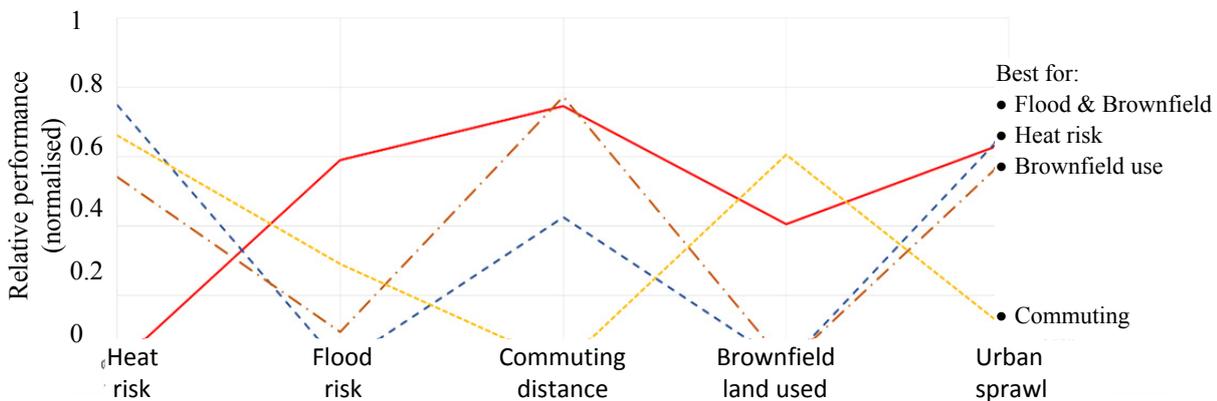
⁹ ‘Grand Paris’ will encompass an assembly of 209 councillors, drawn from local municipalities, and its area of jurisdiction will cover the densest part of the Paris region (covering approx. 7mn people). The new institution will incrementally take on new responsibilities, including urban planning and fiscal powers. By 2018, it will be headed by a new president. The Greater Sydney Commission is a new independent body, created by the New South Wales Government, which will be responsible for metropolitan planning in the Sydney metropolitan area, in partnership with State and local government – see:

<http://www.planning.nsw.gov.au/Plans-for-Your-Area/Sydney/A-Plan-for-Growing-Sydney/Greater-Sydney-Commission>

- Ensuring that London and the wider city region have the capacity and capability to fund and finance urban infrastructure now and in the future. Link to value capture in uplift from public investments and improving on the historically weaker efforts e.g. with Crossrail

It is rarely possible to satisfy all objectives, as is shown in Figure 1, where, for example, strategies that are good for managing flood risk can increase transport use and travel distance for commuters.

Figure 1: Tradeoffs between planning and infrastructure investment choices in London



Source: Caparros-Midwood *et al.* (2015).¹⁰

¹⁰ Caparros-Midwood D, Barr S, Dawson RJ (2015) Spatial Optimization of Future Urban Development with regards to Climate Risk and Sustainability Objectives, Risk Analysis. (also presented in 2nd UGEC conference, Taiwan: <http://ugec2014.squarespace.com/daniel-caparros-midwood>)

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London – on road, rail and underground – including, but not limited to Crossrail 2?

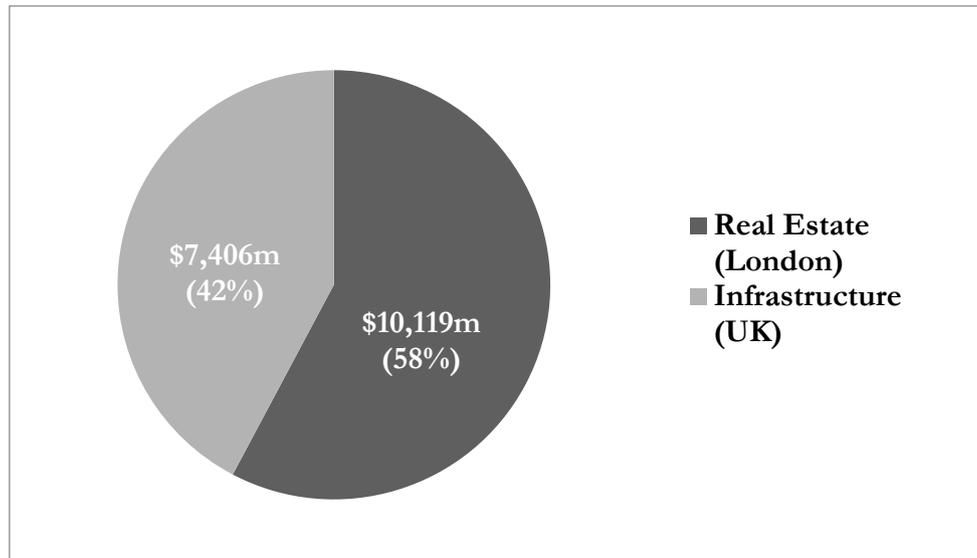
Key messages:

- *Transport infrastructure improvements led by Transport for London and other similar sponsors will increasingly be required to demonstrate their contributions to growth, jobs and housing development, beyond alleviating transport congestion.*
- *Private sector investors are more likely to invest in the early stages of transport schemes if they are part of a broader urban regeneration or development programme*
- *Central government will continue to play an important role in providing regulatory and/or financial backing for large-scale transport projects in London.*
- *Government financial support is also likely to form part of broader, multi-faceted funding packages.*
- *Small-scale interventions can play an important role in improving London's transport infrastructure.*

Under the leadership of Sir Peter Hendy, Transport for London (TfL) began to situate transport investment in a wider context and as an instrument that is measured for its broader impact above and beyond achieving journey time savings. TfL's corporate strategy and business plan have been written so that they identify and explain how individual investment transport infrastructure projects will contribute towards the economic growth and overall prosperity and performance of London. TfL has concluded that planning and investing in transport for London has to demonstrate the wider economic costs and benefits of investment.

Against this background, TfL and other transport infrastructure sponsors have framed Crossrail 2 as a specific intervention that could open up new housing sites and development opportunities as well as improving transport connectivity. This approach reflects the belief that there is a virtuous relationship between transport – housing – spatial planning and local/urban development. International sovereign wealth funds looking to invest in London's transport infrastructure will do so if there is a definitive revenue-raising urban regeneration or housing development scheme attached to a transport project, such as the Nine Elms development, which includes the Northern Line extension. The returns available in London real estate and property make investments in these assets more attractive to foreign investors than transport infrastructure alone (see Figure 2). Furthermore, major transport schemes will always require government-funding as they are often considered too risky for the private sector. Thus, national and local/city-regional governments will continue to play a major role in transport infrastructure planning and investment, especially in large metropolitan areas like London, despite the fact that investment markets are more buoyant in these places than in many other cities.

Figure 2: China foreign direct investment in the UK (2005-2014)



Source: Pinsent Masons and CEBR (2014).¹¹

In terms of future transport linkages, TfL, the Greater London Authority (GLA) and local authorities should recognise the importance of both radial and orbital transport connections in the London city region, as there are important economic units within and outside London's formal administrative boundaries. This requires economic and spatial plans to be aligned and to consider how London and the wider city region is set to develop in terms of population, housing and business growth. For example, in an illustration that the economic centre of London has been moving 'eastwards', TfL announced in January 2016 that it was re-zoning eight London Underground stations near Stratford and the 2012 Olympics site to the boundary of Zone 2 of the Underground.¹² Much of London's future growth is expected to be focused on the capital's Opportunity Areas, which will feature dense, mixed-use developments with high public transport connectivity – particularly in the east of London (Travel in London Report 8, 2015). TfL and the GLA are using the Opportunity Areas to shape and steer the London Plan and give it a clear linkage to economic strategies. Going forward, there will be a visible link in how transport is expected to transform the Opportunity Areas.

Atkins suggests that the focus on public transport improvements (such as rail and road capacity) could be strengthened in the London Infrastructure Investment Plan 2050 if priority was given to bus and cycle networks (to better connect outer London and are important assets for lower-income households)¹³ – helping to build and support a more inclusive and sustainable city region. While the remit of the NIC is on major transport schemes it is important to recognise that there are direct and indirect economic, social and environmental impacts from investment decisions that are based on small-scale interventions. There is also a need to focus on improving the existing transport network in

¹¹ Pinsent Masons and CEBR (2014) [China Invests West: Can Chinese Investment be a Game-changer for UK infrastructure?](#) Pinsent Masons and CEBR: London.

¹² Topham, G. (2014) 'East London tube, DLR and rail stations change zones', [The Guardian](#), Monday 4 January.

¹³ Atkins (2015) [Future Proofing London](#), Atkins and Oxford Economics: London.

London, building upon TfL's interest in whole-life asset management and benchmarking in support of improving performance and resource efficiency. We would, therefore, expect TfL and local highways bodies to look at how best to improve the maintenance and operation of the existing road network, which has seen increased congestion recently, particularly in parts of outer London. SMART technology can also help to manage performance, and TfL has made significant strides in gathering, analysing and deploying 'big data', but as recent events have demonstrated, even these assets have to be made more resilient to 'shocks'.¹⁴

We would anticipate that the strategic options for future transport investment in London would encompass, or at least benefit from, further rail devolution to London and the South East. TfL is looking to apply its existing operational experiences to suburban rail services, where, in some cases, there has been significant improvements. For example, the London Overground network, largely established since 2008, has seen a 321 per cent increase in journey stages between 2008 and 2014, on a like-for-like basis – reflecting the rapid development and enhancement of the network.¹⁵

¹⁴ 'Oyster card glitch leads to free travel in London', BBC News, Saturday 2 January 2016: <http://www.bbc.co.uk/news/uk-england-london-35213346>

¹⁵ Mayor of London/TfL (2015) *Travel in London Report 8*, Mayor of London/Transport for London: London.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Key messages:

- *Crossrail 2 must better capture the value it delivers to the private sector, in particular through capturing the uplift of land and property value, and improving connections to major transport hubs.*
- *Crossrail 2 offers significant development opportunities and connectivity benefits, but at a projected cost of up to £32bn the case has to be made that this investment could not deliver better returns through a series of smaller scale projects in other UK regions.*
- *The Department for Transport, Transport for London and other major transport sponsors should heed the lessons of Crossrail, and consider the recommendations of the National Audit Office to ensure that Crossrail 2 and other large-scale projects deliver value for money for UK tax-payers where government grants have been included in funding packages.*

TfL estimates that Crossrail 2 will cost somewhere between £27bn and £32bn (with a 66 per cent optimum bias included), in 2014 prices and includes the cost of new trains and Network Rail works. In evidence to the London Assembly, PwC suggested that the estimated cost of Crossrail 2 could, if the optimism bias was reduced to a 'more realistic' 44 per cent, be around £20bn.¹⁶ The project intends to relieve demand on London's transport network, and to provide capacity for an extra 270,000 people to access central London at peak times by increasing the number of trains from major destinations across south west London and Surrey (including Wimbledon, New Malden, Kingston and Epsom) and across north east London and Hertfordshire (including Tottenham Hale, Waltham Cross, Cheshunt and Broxbourne). A London Chamber of Commerce poll found that 44 per cent of London businesses saw Crossrail 2 as their top transport priority.¹⁷

The cost of Crossrail 2 is significant, roughly twice the annual capital investment budget spent in London (£15bn), and represents approximately £376m for every mile of the 85 miles of proposed line. The Chancellor of the Exchequer, George Osborne, has indicated that at least 50 per cent of the funding for meeting the cost of Crossrail 2 should come from private sources, which some business organisations have suggested is feasible.¹⁸ While some costs could be saved on the rolling stock for Crossrail 2, further costs are expected to be found during the detailed design stage of the route. A premium will be placed on TfL identifying further savings given that businesses believe that the high cost of transport projects in London is a significant barrier to the delivery of infrastructure improvements.¹⁹

¹⁶ Minutes of evidence available at: <https://www.london.gov.uk/moderngov/documents/s47535/Minutes%20-%20Appendix%20-%20-%20Transcript%20Crossrail%202.pdf>

¹⁷ Further details on the London Chamber of Commerce poll available at: http://www.londonchamber.co.uk/lcc_public/article.asp?aid=7197

¹⁸ London First (2014) *Funding Crossrail 2: A report from London First's Crossrail 2 Task Force*, London First: London.

¹⁹ According to business surveyed in the London Chamber of Commerce poll.

In putting together the funding and financing package for Crossrail 2, the lessons of Crossrail [1] should perhaps be heeded. In particular, Crossrail 2 will be scrutinised for how it captures private land and property value uplift that is expected to be generated given the experiences of Crossrail [1]. Researchers have forecast total house price growth of 13 per cent, between 2013 and 2018, for residential properties located near Crossrail stations, with up to 20 per cent growth in Central London, in addition to underlying capital growth.²⁰ With criticism that the taxpayer could have benefited more from Crossrail in the form of greater tax receipts on developments near proposed stations, it has been suggested that more targeted developer contributions should form part of the funding package for Crossrail 2.²¹ Furthermore, Crossrail does not connect with other recent transport investments such as the Eurostar station at St Pancras or Terminal 5 at Heathrow, and it does not necessarily serve the areas of greatest potential expansion in and around London. Consequently, the final agreed route of Crossrail 2 will need to connect or integrate effectively with other existing or proposed transport infrastructure assets, such as the HS2 terminus in Euston, without producing negative impacts for local residents and businesses in places such as Camden, which brings into focus once again the governance and spatial planning implications of co-ordinating major transport infrastructure investment in London and the wider city-region.

The broader industry contribution of Crossrail is, however, also significant, particularly in the area of skills, where the Tunnelling and Underground Construction Academy, funded primarily by Crossrail, is training the next generation of future engineers. Such inputs should ensure that there are legacies of improved efficiency and productivity in future large-scale [underground] transport infrastructure projects similar in nature to Crossrail.

With the current public consultation for Crossrail 2 closing on 8 January 2016, TfL will have, at its disposal, a large volume of evidence and opinion, submitted as part of the consultation exercise. In addition, the Crossrail 2 Growth Commission's call for evidence, which closed on 23 December 2015, is also expected to be an important source of information, data and evidence that TfL and partners will have as they seek to reflect upon how best to strengthen the benefits and reduce the costs of Crossrail 2. In the current austere times, and with demands for more transport investment in the regions and nations outside of London, the economic, social and environmental case for Crossrail 2 will come under ever-closer scrutiny, and the project will need to demonstrate that it can be delivered in an effective and cost-efficient manner. TfL and the other sponsors of Crossrail 2 will no doubt be guided by the findings of the National Audit Office in its 2014 report on Crossrail, to see what lessons that can be applied in the project development and implementation of Crossrail 2. In considering the costs and benefits of Crossrail 2, it is useful to reflect upon the following recommendations in the NAO's review, which were directed specifically at the Department for Transport (DfT), and outlined a series of steps to strengthen tax-payer 'value for money' from future major transport projects:²²

- Do more to secure private sector funding contributions. The Department should ensure that when it negotiates contributions to projects from businesses and other organisations, these are based on

²⁰ CBRE (2013) *Crossrail: The Impact on London's Property Market*, CBRE: London.

²¹ Pickford, J. and Allen, K. (2014) 'Crossrail a shot in the arm for London property developers', *Financial Times*, 6 March 2014.

²² NAO (2014) *Crossrail, Report by the Comptroller and Auditor General*, National Audit Office: London, p11.

robust and realistic calculations of the benefits to business. The Department should also work to understand private sector funders' interests in its projects and how these may affect the certainty of funding.

- Consider how to achieve greater continuity in departmental officials' oversight of major programmes. The Department should identify how it will manage staff assignments to its various programmes, ideally to appoint officials for longer periods, and to manage the 'handover' process, where necessary, to achieve a smooth transition.
- Monitor all costs on major programmes including development, start-up and sponsorship costs so that it can develop an understanding of the true costs of major programmes, to help it keep these costs under control. We would expect all government departments to do this on their major programmes.
- Ensure that programmes have sufficient cash available to provide security and flexibility to the delivery body, while minimising opportunity costs.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

Key messages:

- *iBUILD research has identified a range of funding and finance schemes (Table 1) suitable for large projects, each with different advantages and disadvantages.*
- *TfL's strategic oversight in London, compared to other transport governance structures in the UK, provides them with far greater opportunity to capture and utilise value.*
- *TfL and other transport infrastructure sponsors in London will be encouraged to identify and adopt more 'innovative' funding and financing packages to support transport infrastructure investment. However, such packages are likely to be based on greater speculative forms of urban development and therefore may increase the financial risks for TfL and other institutions.*

Against the background of a reduction in central government grant funding to cover its operational budget, TfL has been encouraged to be more 'innovative' in how it funds and finances transport infrastructure in London. According to one DfT official:

“We've strongly encouraged TfL to get more savvy in the way it generates income from its estate, for example, so it's got a very ambitious commercial development programme now, which covers everything from, the sponsorship deals for Santander cycles to advertising at tube stations, to flogging off the old headquarters at 55 Broadway, which is all going to be turned into luxury homes and so on...” (iBUILD research interview with DfT official, September 2015).

There is a strong push for TfL to widen and deepen its engagement in land and property development in order to generate new revenues to fund transport infrastructure and/or services. Consequently, there are few, if any, projects in TfL's capital investment plan that are not linked to economic development, employment or housing. TfL believes that this will enable the organisation to leverage additional private and public funding. While grant funding is still the preferred mechanism, in the current fiscal climate this is increasingly testing, although for major transformational projects central government is still expected to commit resources as part of overall funding packages. While TfL is looking to become 'self-sufficient', the organisation believes that 'transformational' infrastructure schemes will require alternative funding mechanisms, which draw upon finance from a range of different sources.

As infrastructure becomes funded and financed in increasingly financialised ways, different practices, tools, instruments and governance arrangements are being modified or constructed in order to fund and finance local infrastructure. A variety of different infrastructure funding and financing practices have emerged in recent years, many of which blur and/or straddle traditional notions of public-private boundaries (Table 1). We would expect TfL and its partners to adopt some of these practices to suit specific projects and geographical contexts, subject to appropriate fiscal powers and capability being

evident. Some transformative transport schemes will require national government financial backing, in the form of direct grant, infrastructure guarantee or through borrowing. However, the likelihood is that international and national private infrastructure financiers will be reluctant to invest in the early phases of the infrastructure life-cycle of major transport projects:

“Some commentators cite that a “wall of money” from Sovereign Wealth Funds, Infrastructure Funds, Pension funds and other similar investors is available to invest in infrastructure, and that this provides evidence that projects such as Crossrail 2 could be privately financed. While there is no doubt that these investors are keen to invest in infrastructure, Crossrail 2 is unlikely to meet many of their investment requirements. The size of the project, the construction risk, the demand risk and the likely reliance on non-patronage revenues to pay the bulk of the project means that, without direct government guarantees, such investors are unlikely to invest in Crossrail 2”.²³

We would recommend that the NIC examines the 2014 report produced by PwC, which considered the range of different mechanisms and practices that could be used to fund and finance Crossrail 2.

Land (or property) value capture mechanisms offer a potential funding source for Crossrail 2. However, in the iBUILD case study of the governance of infrastructure funding and financing in London, officials that were interviewed were mindful of the ‘political difficulties’ of increasing residential taxation, despite recognising that value capture was the only ‘fair means’ of ensuring that those who benefitted most from Crossrail 2 made the biggest financial contribution. Increasing fares to generate extra revenues is also problematic given commitments by the current Mayor of London to ‘freeze fares in real terms’, and other statements by mayoral candidates. Consequently, additional financial options are being explored, including the feasibility of extending the hypothecated business rate supplement tax that has been funding Crossrail [1].

Finally, TfL and other infrastructure sponsors should consider whether there are alternative quick and cost-effective wins from smaller schemes that could support London’s transport infrastructure and make the overall network more efficient. TfL could perhaps look at whether it is possible to make improvements, such as bringing back sections of unused rail line, to generate additional benefits, as has happened with the London Overground. The engineering consultancy firm, Atkins, makes a similar argument, suggesting that:

“The 2050 [London Infrastructure Investment] Plan rightly makes some ambitious plans for infrastructure provision. However, consideration should be given to whether investment in a greater number of smaller scale interventions could achieve wider benefits”.²⁴

²³ PwC (2014) *Crossrail 2: Funding and Financing Study*, PwC: London, p7.

²⁴ Atkins (2015) *Future Proofing London*, Atkins and Oxford Economics: London, p 88.

5. How have metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

Key messages:

- *Preparation of the London Infrastructure Investment Plan 2050 was an important step in defining strategic priorities, and echoed similar arrangements in other leading UK and international cities. Integrating this with other planning processes provides further opportunities.*
- *A review of over one hundred infrastructure business models by the iBUILD research team highlights the potential diversity of approaches that should be explored to capture more value from local and urban infrastructure.*
- *The ability of London to address its economic, social and environmental challenges, by implementing a wider range of transport infrastructure funding and financing mechanisms and practices, similar to those employed in other international cities, will depend upon the UK government granting London greater fiscal autonomy to raise and retain local tax revenue and increase borrowing for capital investment purposes.*
- *There is a case for a systematic study to be commissioned of how these issues are being tackled in other global cities. Sydney is making new moves to tackle these infrastructure and spatial planning challenges, as is New York and Paris, and there may be common lessons to be learned, which could benefit London.*

We welcome the fact that London has published its first infrastructure investment plan, along similar lines to strategies that have been produced and implemented by other global cities, such as New York, Tokyo and Seoul as well as other UK cities (e.g. the Newcastle-Gateshead Infrastructure Delivery Plan). Lessons from international practice suggest it is important that the London Infrastructure Investment Plan and statutory London [Spatial] Plan are closely aligned, and that the infrastructure plan also fits with local development and planning frameworks in and around the London city region. This requires close engagement, even co-production, between a wide-range of different institutions and actors. iBUILD research has highlighted the benefits of taking a whole systems view to infrastructure by considering integrating with spatial planning policies. For example, reducing demand for services through ‘hidden infrastructure’ such as investment in efficiency measures and demand management strategies reduces consumer bills, frees up capacity to support growth and regeneration, and defers the need for expensive capital investment in new infrastructure (e.g. for new power stations and water treatment works). The National Infrastructure Plan, for example, sets out a pipeline of £65bn investment in energy generation and £45bn investment in energy networks over the coming years. Yet, investing a third of this in energy efficiency measures over the next four decades could free up 12 per cent headroom in generation capacity.²⁵

²⁵ Gouldson A, Kerr N, Millward-Hopkins J, Freeman MC, Topi C & Sullivan R (in review) Innovative Financing Models for Low Carbon Transitions: Exploring the case for revolving funds for domestic energy efficiency programmes. Based on

In terms of funding and finance, London currently spends around 5 per cent of its annual Gross Value Added (GVA) on capital investment while its international competitor cities spend between 10-12 per cent.²⁶ One of the other challenges facing London is that it is still required to secure central government financial or regulatory agreement for major transport infrastructure on a project-by-project basis. And unlike other global city leaders, the Mayor of London and London Boroughs have limited powers to raise their own local revenue (Table 2).

Table 2: Municipal operating expenditures and taxes per capita

	Municipal Operating Expenditures per capita (£)	Municipal Taxes (local and shared taxes) per capita (£)
London – GLA plus boroughs (2011)	3,199	476
Berlin (2010)	4,910	2,570
Frankfurt (2010)	3,577	2,140
New York (2011)	4,561	3,078
Madrid (2009)	1,267	490
Paris (2011)	2,699	1,896
Tokyo (2010)	3,301	2,312

Source: Slack (2013: p5)

On the subject of fiscal decentralisation and global cities, we would direct the NIC towards two useful studies that have undertaken detailed analysis of how London compares to other global cities and city regions when it comes to planning, funding and financing urban infrastructure. The first reference is a working paper written by Enid Slack (University of Toronto) which was commissioned by the London Finance Commission.²⁷ The paper offers an international comparison of the current methods of raising revenues in seven global cities -- London, Paris, Berlin, Frankfurt, Madrid, Tokyo, and New York -- and evaluates the costs and benefits associated with greater devolution of revenue tools to the Greater London Authority (GLA), with Slack suggesting that:

“London would benefit from greater fiscal autonomy – access to a mix of taxes and the ability to set the tax rates. A mix of taxes would give it the flexibility it needs to respond to changing economic circumstances. Local fiscal autonomy and, in particular the ability to set tax rates, is also important for accountability: governments that raise their own revenues and set their own

an earlier working paper: Gouldson A, Kerr N et al. (2014) *Revolving funds for infrastructure business models*, iBUILD Working Paper, iBUILD, Newcastle University: Newcastle upon Tyne.

²⁶ Based on statistics set out by Professor Tony Travers, London School of Economics, in a presentation given to the ‘Developing a Long Term Infrastructure Plan for London’ seminar, Monday 16 December 2013, City Hall, London.

²⁷ Slack, E. (2013) *International Comparison of Global City Financing: A Report to the London Finance Commission*, University of Toronto: Toronto.

taxes to meet local expenditure needs tend to be more responsible and more accountable to taxpayers.²⁸

The second report was published by PwC in 2014, and considers the various funding and financing mechanisms and practices that could be deployed to deliver investment in Crossrail 2, and includes a comparative analysis of how transport infrastructure projects are funded and financed in the following cities: Paris; San Francisco; Atlanta; Copenhagen; New York; Greater Toronto; Chicago; Melbourne and Sydney.²⁹ In the report, PwC concludes that London would find it problematic to replicate some of the funding arrangements employed in other international cities without greater fiscal autonomy:

“Our review of funding approaches used internationally shows that many other cities use a range of property and other taxes to fund transport infrastructure. On the face of it, similar levies implemented in London would be capable of funding a substantial part of the funding requirement for Crossrail 2. However, when we have looked at how such levies have been implemented, many appear to rely on enforcement systems that have evolved over time and in part rely on there being a general level of fiscal devolution across all local or regional authorities. This is several steps away from where London is now in terms of progress towards the first steps of fiscal devolution”.³⁰

Alternative and integrated infrastructure business models

Business models take into consideration different governance, but must also consider the wider infrastructure system that comprises (Figure 3):

- *physical artefacts* – includes the physical links, nodes and components of infrastructure systems such as roads, bridges, pipes and cables;
- *processes* – includes actors, institutions, management, regulation, protocols and procedures that govern the infrastructure over its lifecycle;
- *resources* – includes people, vehicles, water, electricity and data that are conveyed by the physical artefacts and the materials used in the construction of the artefacts; and
- *services* – such as warmth, mobility, sanitation, transportation, welfare services and communication that benefit a wide range of users.

Infrastructure is therefore the artefacts and processes of the inter-related systems that enable the movement of resources in order to provide the services that mediate (and ideally enhance) security, health, economic growth and quality of life at a range of scales.³¹ Moving beyond a narrow or solely economic view and distinct from the world of more conventional goods and services, an infrastructure

²⁸ Ibid, p26.

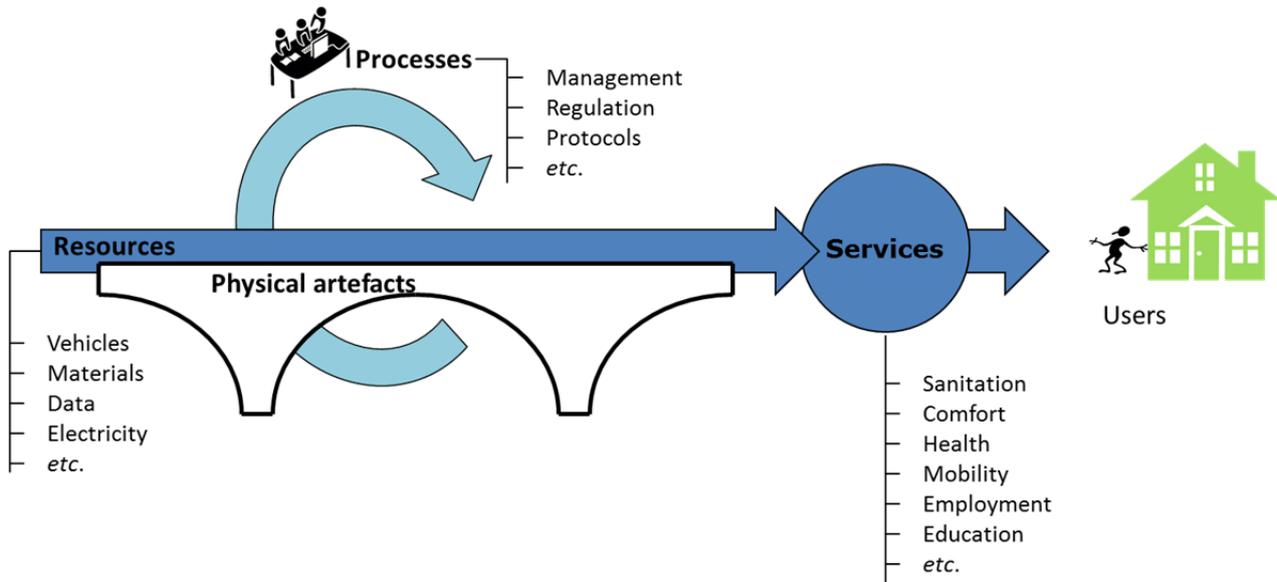
²⁹ PwC (2014) *Crossrail 2: Funding and Financing Study*, PwC: London

³⁰ Ibid, p57.

³¹ Dawson RJ (2013) *Bridges n'that: An infrastructure definition for iBUILD*, iBUILD Briefing Note 1.

business model therefore describes how infrastructure systems create, deliver and capture economic, social and environmental values over the whole infrastructure life cycle.³²

Figure 3: A systems view of infrastructure



Source: iBUILD (2015: p5).

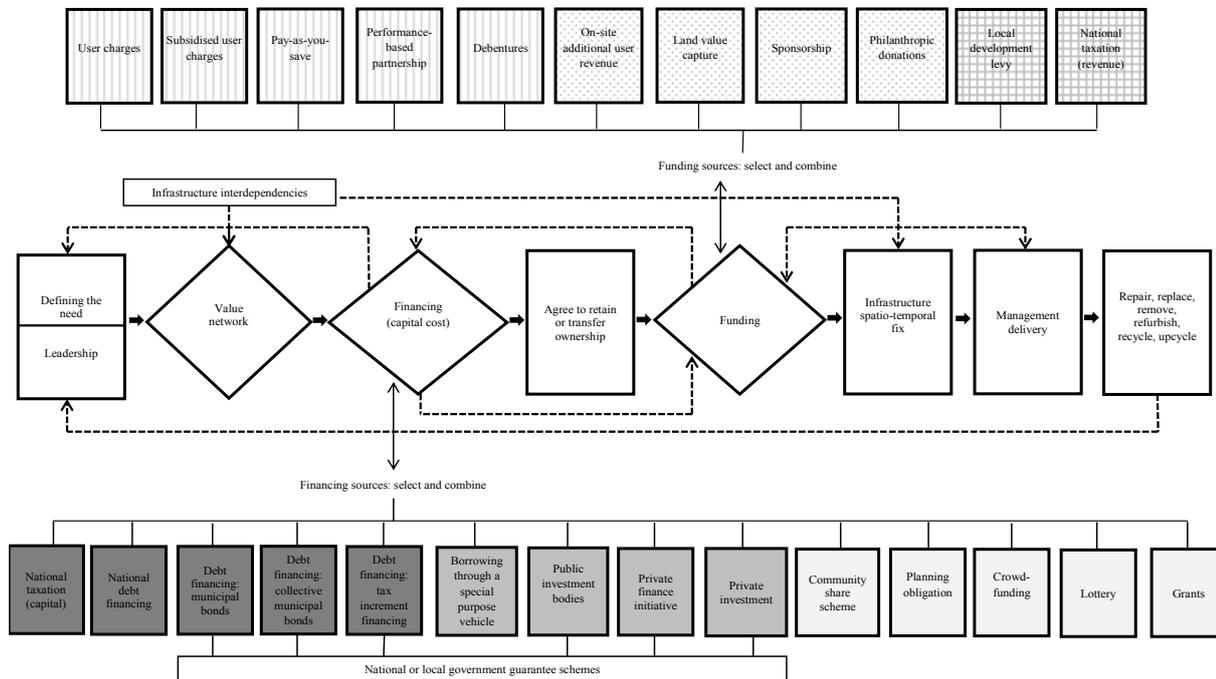
iBUILD has undertaken a review of over hundred UK and international local infrastructure business models, both traditional and non-traditional, across all infrastructure asset classes.³³ The business models are diverse. Value creation includes social, economic and urban regeneration outcomes as well as direct outputs in terms of service supply. International comparison has illustrated how the development of business models from niche to established mainstream models reflects the regulatory, political and socio-economic context (Bryson *et al.*, in review).³⁴ For example, the success of municipal decentralised energy supply in Denmark and subsidy-supported business models for local energy supply in the UK.

³² Bryson JR, Pike A, Walsh CL, Foxon T, Bouch C & Dawson RJ (2014) *Infrastructure Business Models*, iBUILD Briefing Note 2.

³³ Currently online here: <http://ceg-research.ncl.ac.uk/ibuildDemo/> (URL subject to change when site goes fully live)

³⁴ Bryson, J. R., Mulhall, R., Song, M. Loo, and Dawson, R. J. (in review) 'Conceptualising Local Infrastructure Business Models: The Spatio-Temporal Fix', *Research Policy*.

Figure 4: Conceptual Framework of Local Infrastructure Business Models



Source: Bryson et al. (in review).

Developing and implementing alternative approaches provides some benefits, but as noted above, our infrastructures are increasingly interconnected and some of the most promising opportunities are from thinking about delivering what people really require i.e. warmth, light, mobility etc. rather than electricity, gas, roads. This can help identify business models that deliver efficiencies across multiple ‘traditional’ sector boundaries. A rapidly emerging interdependence is between electricity and transport infrastructure – most notably uptake of electric vehicles (EVs). Coupled analysis of energy and transport systems models, has demonstrated that distribution networks could accommodate higher growth in electric vehicles than previous studies have suggested. Exploiting the geographic spread and different timings of EV charging can limit the impact on power infrastructure. Distribution network operators should collaborate with new market players, such as charging infrastructure operators, to support the roll out of an extensive charging infrastructure to make both networks more robust.³⁵

A well-established demonstration of the value of integrated infrastructure thinking applied to an industrial park – now an industrial ecosystem – is the closing of material and energy loops locally with integrated infrastructure in Kalundborg, Denmark. Since 1972, this industrial park has evolved from a single power station into a cluster of companies that exchange materials and energy for mutual benefit as by-products from one business are often inputs for others. For example, treated wastewater from a refinery is used to cool a power station which in turn provides steam for the refinery and a pharmaceutical plant. Surplus heat from the power station is also used for warming nearby homes and

³⁵ Neaimeh M, Wardle R, Jenkins A, Hill GA, Lyons P, Yi J, Huebner Y, Blythe PT & Taylor P (in press) A probabilistic approach to combining smart meter and electric vehicle charging data to investigate distribution network impacts, *Applied Energy*.

businesses. This has led to substantial annual savings of resources and costs – for example, a reduction in water consumption of 3.3mn m³/year, savings of \$15m from resource sharing and far larger savings by sharing infrastructure have been reported – highlighting how integrated infrastructure business models can produce substantial savings.³⁶³⁷

There are many potential ways of organising and regulating such interactions to create efficiencies. For example, in 1887 in Indianapolis, local civic leaders established a natural gas company as a Public Trust, with an aim to “create the greatest long-term benefit for customers and communities”. Today, the Citizens Energy Group owns and operates a large portfolio of physical infrastructure assets that deliver multiple services including energy, water and wastewater for 800,000 people and thousands of businesses in the Indianapolis area. This has provided community services that are entirely compatible with good financial management. The group was awarded a top rating (MIG 1) by Moody’s credit rating agency in 2014, a reflection, in part, of the strength of the company’s infrastructure business model.³⁸ By recognising the opportunities from the interdependencies of modern infrastructure, and explicitly designing this into our energy and other systems, this not only offers opportunity for alternative business models but also can be used to deliver flexible infrastructure systems that can enhance resilience.³⁹

³⁶ Chertow MR & Lombardi DR (2005) Quantifying Economic and Environmental Benefits of Co-Located Firms, *Environmental Science & Technology*, 39(17):6535 -6541.

³⁷ Chopra SS & Khanna V (2014) Understanding resilience in industrial symbiosis networks: Insights from network analysis, *Journal of Environmental Management*, 141:86-94.

³⁸ www.moodys.com/research/Moodys-Concludes-Review-and-Confirms-MIG-1-on-Indianapolis-Indiana--PR_302963

³⁹ Khoury M, Bullock S, Fu G, and Dawson RJ (2015) Improving measures of topological robustness in networks of networks and suggestion of a novel way to counter both failure propagation and isolation, *J. Infrastructure Complexity*, 2(1):1-20.

Table 1: Infrastructure Funding and Financing Practices⁴⁰

Temporality	Type	Examples
<p style="text-align: center;">Established 'Tried and Tested'</p> <div style="text-align: center;">  </div> <p style="text-align: center;">Newer 'Innovative'</p>	Taxes and fees	Special assessments; User fees and tolls; Other taxes.
	Grants	Extensive range of grant programmes at multiple levels (e.g. federal national, province, state, supranational)
	Debt finance	General obligation bonds; Revenue bonds; Conduit bonds; National Loans Funds (e.g. PWLB).
	Tax incentives	New market/historic/housing tax credits; Tax credit bonds; Property tax relief; Enterprise Zones.
	Developer fees	Impact fees; Infrastructure levies.
	Platforms for institutional investors	Pension and Insurance infrastructure platforms; State infrastructure banks; Regional infrastructure companies; Real estate investment trusts; Sovereign Wealth Funds.
	Value capture mechanisms	Tax increment financing; Special assessment districts; Sales tax financing; Infrastructure financing districts; Community facilities districts; Accelerated development zones.
	Public private partnerships	Private finance initiative; Build-(own)-operate-(transfer); Build-lease-transfer; Design-build-operate-transfer.
	Asset leverage and leasing mechanisms	Asset leasing; Institutional lease model; Local asset-backed vehicles.
	Revolving infrastructure funds	Infrastructure trusts; Earnback and Gainshare

⁴⁰ Strickland, T. (2015) Infrastructure Funding and Financing, unpublished PhD thesis, Newcastle University: Newcastle upon Tyne.



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Rail Investment Priorities in London & the South East

This document sets out the author's personal view on possible methods for infrastructure investment prioritisation, built on his experience having been involved in Signalling Supply, Network Rail Major Programmes, and now the Crossrail Programme.

The author has a number of feasibility schemes worked up in more detail, and would be more than happy to share his personal views on incremental investment opportunities targeted at maximising the use of existing rail corridors, if the panel should wish to pursue this.

How should Rail Investment in London be prioritised?

New major programmes, Crossrail, HS2 and Crossrail 2, creating new railway corridors, in the author's view, should be complemented with work prioritised on two bases;

1. Maximising the use of existing rail corridors, such that each two-track commuter corridor is optimised to carry up to 24 tph of up to 12-Car trains in each direction – i.e. to move up to on average 1,500 people x 24 trains per hour = 36,000 people per hour. Investing in existing corridors in priority to complement and integrate with the new major programmes such as Crossrail, HS2, and Crossrail 2 – e.g. improving the feeder networks to these new schemes.
2. Optimising the development of London by considering transport projects as an integrated part of planning permission for new property development, and not allowing existing railway corridors to be constrained. In fact using developer's to assist in the incremental expansion of existing railway corridors to complement the new major schemes.

Which existing railway corridors are constrained, and could be expanded?

Existing railway corridors are typically constrained by not having enough platform capacity to support maximum train volumes, and / or are unable to support longer trains. Examples include:

1. 2 track corridor (The DC Lines) alongside West Coast Main Line between Euston and Watford Junction, used by 6-car Underground trains, and short formation London Overground trains at less than 10 trains per hour in total. The proposed link from the Crossrail scheme at Old Oak Common onto the West Coast Main Line could be fed from services using incrementally expanded DC Lines, releasing capacity at Euston by diverting West Coast suburban services through into Crossrail train paths. A win-win for existing corridor usage maximisation, and an enabler for a more major Euston Master Plan (for example).
2. 2 track corridor (The East London Line) connecting the Brighton Lines to the North London Line, but only used by up to 5-Car London Overground trains, with stations that are too closely spaced, and a service frequency of around 15 trains per hour.
3. 4 track corridor between Loughborough Junction and Blackfriars, planned to be used by just 8 trains per hour for through Thameslink services (mainly 8-Car) from 2018, and having capacity only for 8tph of up to 12-Car terminating services at Blackfriars. i.e. 16tph in total for the 4-track corridor. (Constrained further south by Herne Hill and Tulse Hill approaches which could be changed through combined investment in development in these areas)
4. Brighton Main Lines (BML) corridor, serviced at East Croydon by 8 tracks toward London Bridge and London Victoria, and therefore should be capable of fielding up to 80 trains per hour in each direction (considering some services need to service West Croydon), however with only 6 through platforms at East Croydon, a 4-track railway corridor south of there, and a series of flat junctions and inadequate numbers of platforms for splitting and joining

further south, the BML is constrained to a probable maximum capacity of about 40 tph, or half its potential.

5. 4-track (but 3-track in places) North London Line corridor between Dalston Junction and Euston area, reserved for freight traffic to await paths toward Willesden, and a small number of short London Overground trains per hour passenger services. Could service diversion of traffic from the south end of the West Coast DC Lines corridor, linking in a Thameslink-style fashion through to the East London Line, and the Brighton corridor.
6. Great Northern lines terminating in Moorgate – could be extended through tunnels via London Bridge to link to the Bright Main Lines, therefore delivering another 24tph North South corridor opportunity. Tunnelling activity currently being undertaken in the Bank area might be quite easily extended in the immediate future to create new link required.

What is typical in terms of missed Development opportunities?

In London and the South East up until 2015, with the exception of the new Crossrail development, property development has included very little consideration of the transport opportunities that could be released for the railway corridor. Examples include:

1. The South Bank development at Blackfriars, in which a large residential tower block at the south station will for the next 30 to 50 years block any possibility of access to the remaining old railway bridge piers standing in the River Thames, which could have been used to provide two more terminating platforms for trains from the south arriving at the newly expanded Blackfriars Station. The new towers even include cut-out corners at higher levels for roof garden spaces, yet have no cut-out at bridge level for the railway.
2. The new development at Elephant and Castle has no provision for terminating platforms that could logically have provided a well-connected new southern London Terminus to augment Blackfriars sitting on one of the most underutilised 4-track railway corridors in London.
3. Finsbury Park residential development adjacent to the station on the ECML that is proven (December 2014 debacle) to require major upgrade to increase interchange connectivity.

How could incremental railway corridor improvements be sized and optimised to support new build railway projects?

Railway corridor improvements could be sized and optimised along the following broad rules:

1. Platforms could be extended generally to accommodate 12-Car trains on most suburban lines serving London
2. Where possible, terminal platforms supporting around 4tph per platform face, should be replaced by Through Connections. At Through Platforms with limited interchange, 24tph in each direction can be accommodated with modern rolling stock using ATO (similar to Thameslink Core Area, and Crossrail Central Operating Section), and 18tph in each direction if driven manually – therefore a huge increase on usable corridor capacity. At large scale interchange stations such as London Bridge and East Croydon, 18tph with ATO, and 15tph manually driven would be more supportable timetable planning rules.
3. Railway corridor incremental improvements could be optimised to support and divert commuter numbers away from the places that are being developed in the new build railways – e.g. diverting traffic away from Euston while Crossrail 2 and HS2 are built. I.e. a similar approach to that used when diverting Thameslink traffic from London Bridge to Blackfriars, but on a more effective and larger scale.

4. The application of Digital Railway techniques to increase capacity (as used on the Thameslink Core Area to give +4tph under ATO / ETCS) should only be considered feasible where successive flat junctions and constrained platforms have first been addressed. E.g. with successive flat junctions on the BML for example, it is the author's personal view that it is not possible for Digital Railway techniques to make a large increase in the overall train flow rates, as all that is achievable in practice is bunching up between successive flat junctions and stations.

Examples of incremental improvements for Brighton Main Line corridor:

The following scenario of prioritised incremental railway corridor improvements to support and maximise the usage of the Brighton Main Line gives one example of the sort of schemes that the author would propose:

1. Provision of 6 new platform roads underneath the existing East Croydon Station served exclusively by the London Bridge corridor. i.e. existing above-ground station serves the Victoria corridor only, and underground serves London Bridge.
2. South of East Croydon station, widen the railway corridor to provide for the fly-down connections to the new underground station at East Croydon, thus creating a 6-track approach from the south to both upper and lower platforms. Remodel the junction south of South Croydon station, so as to provide a 50mph grade-separated junction to the East Grinstead lines, and two lines sweeping alongside the allotments to provide a 6 track approach through Purley Oaks, south towards Purley.
3. At Purley, provide 6 platform faces and a 4-track railway corridor toward Coulsdon South for slow-line services, with no platform faces on the Fast Lines.
4. At Coulsdon South provide a 4-track railway corridor in place of the current 2-tracks through the station; 2 non-stopping relief lines in the centre, and moving the platforms to the outside of the corridor. (Fast lines remain unchanged). Relief lines converge just south of the station to run through the deep cuttings and tunnel – i.e. 4-track corridor remains through towards Merstham and Redhill.
5. At Merstham, expand the station to have four platform faces on the Slow Lines, utilising the unused land currently sitting between the Fast and Slow Lines.
6. At Redhill, expand the station to have five platform faces – a new Tonbridge platform to the east of the current station built over the current post office depot, as well as the planned Platform 0 on the west of the station serving the Reigate lines.
7. Provide a grade-separated junction between the Fast and Slow Lines just south of Redhill, before Earlswood Station. Also provide a 12-Car central turn-back platform between the Down Slow and Up Fast at Salfords station, for use during perturbation.
8. North of Gatwick Airport provide a wider northern throat with a 6-track approach, and grade-separated cross-over to allow routing of trains between the Fast and Slow lines to and from the London direction.
9. At Three Bridges, provide 6x12-Car platforms, re-building the currently disused western-most platform face for Up trains from the Horsham lines. Move the siding north of Three Bridges to the centre of the layout between the Fast and Slow Lines to provide a turn-back facility for cross-corridor Depot moves, and provide a grade-separated junction between the Horsham lines and the Brighton Lines north of the turn-back siding.
10. Extend the East Grinstead lines south through the Heritage Bluebell Railway corridor, to Horsted Keynes, and then re-build the dismantled railway between Horsted Keynes and Haywards Heath to re-join the Brighton Main Line. This will provide a cheaper alternative to

BML2 proposals via Lewes, and even allowing for heritage railway traffic, a 2-track corridor extension from East Grinstead could easily support the additional trains envisaged to flow to Brighton in the BML2 scheme. In effect this creates a 4-track railway corridor as far as Haywards Heath on the Brighton Main Line, with 2 tracks via Balcombe and 2 tracks via East Grinstead.

11. Widen the railway corridor to 4-tracks south of Haywards Heath to Wivelsfield, and grade-separate Keymer Junction and remove the level crossing on the Lewes lines by lowering these tracks to pass under the road.
12. While leaving just two tracks through the corridor via Burgess Hill and Hassocks, reinstate the fourth platform at Preston Park, and provide a grade-separated junction north of this station, thus allowing trains from Hove to exclusively serve the 2 western-most platforms, and trains to and from Brighton to exclusively serve the 2 eastern-most platforms.
13. Widen Brighton station by providing 2 new platforms on the eastern-most side where the multi-storey car park is sighted today, providing an increased car-parking capacity below the new platforms.
14. Widen the Brighton throat to allow more flexible approaches, to maximise use of the improved 2-track corridor toward London.

Summary

This document gives a personal view of the author as to how investment in incremental schemes to release capacity in existing railway corridors might be used in an incremental way to feed and integrate with the new major programmes that are proposed in the London Area such as Crossrail and Crossrail 2, as well as the southern end of the HS2 programme.

While the examples quoted above obviously do not work in isolation, the author has thought through a pattern of works and outline feasibility plans which if the panel had time, and was minded, he would be very pleased to discuss in more detail.

It is hoped that sufficient detail has been included herein to give visibility of an overall philosophy that could be utilised in planning and prioritising investment works.

Contact Details:

[contact redacted]

WESTLINK : PROPOSED NEW CROSS-CAPITAL ROUTE

London has historically been served by more main line terminus stations than any other major city, and this has had, and continues to have, huge implications for cross-city connectivity. The major congestion and delays suffered by passengers as they are forced disembark from main line train to already packed Tube train have provided the impetus for development of new cross-city rail routes such as Thameslink, the East London Line and CrossRail (currently under construction). Collectively, these cross-capital lines will have a transformational effect upon London's rail connectivity, and planning is already in progress for the next project, commonly known as CrossRail 2.

CrossRail 2 has grown out of the original proposal for the 'Chelsea-Hackney Tube', first put forward in the 1970s. It is likely to comprise a 'heavy rail' route linking the South Western Main Line near Wimbledon with the West Anglia Main Line near Clapton, possibly with a branch towards Alexandra Palace. The Wimbledon - Clapton trunk route will require around 28km of tunnel, and 9 new deep-level underground stations; a project cost of £15 billion has been predicted. The impetus for CrossRail 2 has recently increased, owing to the congestion likely to arise with the projected development of Euston as the London terminus for HS2. With only the Northern and Victoria Lines available to disperse incoming passengers, the projected alignment of CrossRail 2 has been amended to include a new stop at Euston.

Although CrossRail 2 will undoubtedly bring major connectivity benefits for London, it should not be regarded as the only option to relieve congestion at Euston, or to improve cross-city connectivity on a south-west/north-east axis. This paper puts forward the alternative 'Westlink' proposal for a core route linking Waterloo, Charing Cross and Euston that will deliver far greater connectivity than CrossRail 2, for a fraction of the tunnelled length (and therefore cost).

CLC1 : PROPOSED 'CROSSRAIL 2' CROSS-CAPITAL ROUTE

The 'regional' heavy rail option for CrossRail 2 is shown superimposed onto central London's local rail network. All the length shown on the plan will be in deep-level tunnel, with underground platforms at all stations. As previously noted, around 28km of tunnel (twin bore) and 9 underground stations will be required.

CLC2 : PROPOSED 'WESTLINK' CROSS-CAPITAL ROUTE

Westlink's core section - comprising an elevated connection from Waterloo Station to Charing Cross river bridge, an underground route from Charing Cross to Euston, and a further northward tunnelled extension to Gospel Oak - will allow the Richmond-Waterloo, Bromley-Victoria (via the redundant Eurostar curve at Nine Elms) and Orpington-Charing Cross lines to connect to the Euston-Watford and Gospel Oak-Barking lines. A link to the West Anglia main line at Tottenham Hale will effectively replicate the regional functionality of CrossRail 2. 6 main line routes will be connected, for a total tunnelling requirement of less than 5km.

CLC3 : 'WESTLINK' PROPOSAL INTEGRATED WITH OTHER LOCAL RAIL SCHEMES

Westlink will be fully integrated into London's local rail network. Interchanges are proposed at Queenstown Road / Nine Elms (also serving the projected Nine Elms development), at Kentish Town West (for North London Line), at Harringay (for Thameslink Great Northern), and at Harlesden (for CrossRail extension to Chiltern).

CLC4 : WESTLINK & CROSSRAIL 2: ROUTEING COMPARISONS

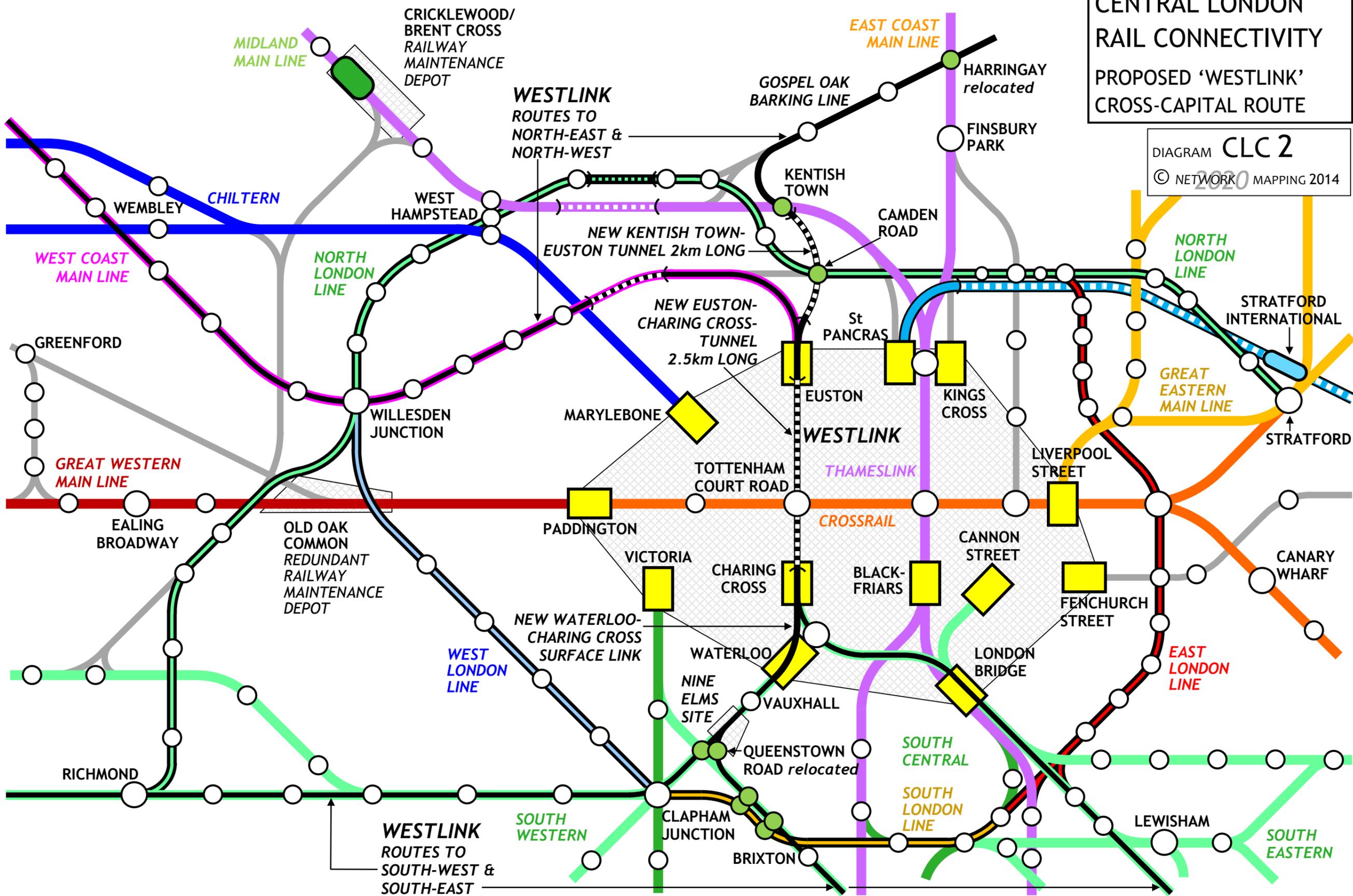
The potential networks facilitated by CrossRail 2 and Westlink are shown together, to allow direct comparison to be made. On the basis of the much reduced length of new tunnelled construction, a notional cost estimate of around £5 billion might be made for Westlink, perhaps £10 billion cheaper than CrossRail 2.

CLC5, CLC6, CLC7 : DETAILED PLANS SHOWING WATERLOO-CHARING CROSS ELEVATED ALIGNMENT

The elevated route between Waterloo and Charing Cross is crucial to the Westlink scheme. The route will enter Waterloo Station via the currently redundant Eurostar terminal, with tracks and structure realigned to continue north on viaduct to connect to the existing line into Charing Cross. The proposed alignment trims the Shell Centre, and this will require major modifications to curve the frontage to align with the new railway. Most of the length of Charing Cross station trainshed must be devoted to the ramp necessary for the new northward tunnelled route to dive below ground level; instead, the Westlink platforms at Charing Cross will be established largely on the river bridge, with major structural modifications required. This presents an opportunity for a direct stair/escalator link to the better-connected Embankment Tube station.

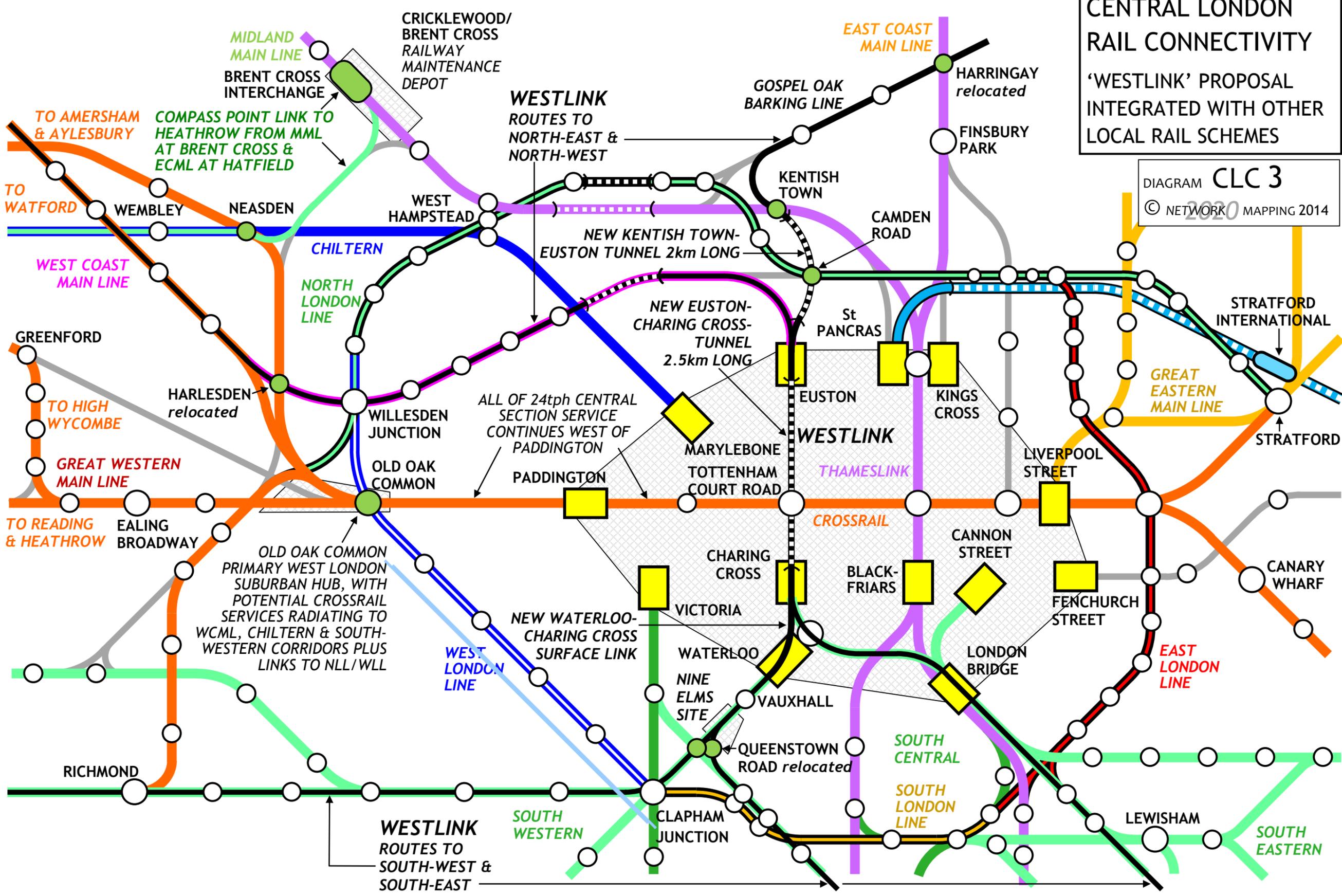
CENTRAL LONDON RAIL CONNECTIVITY PROPOSED 'WESTLINK' CROSS-CAPITAL ROUTE

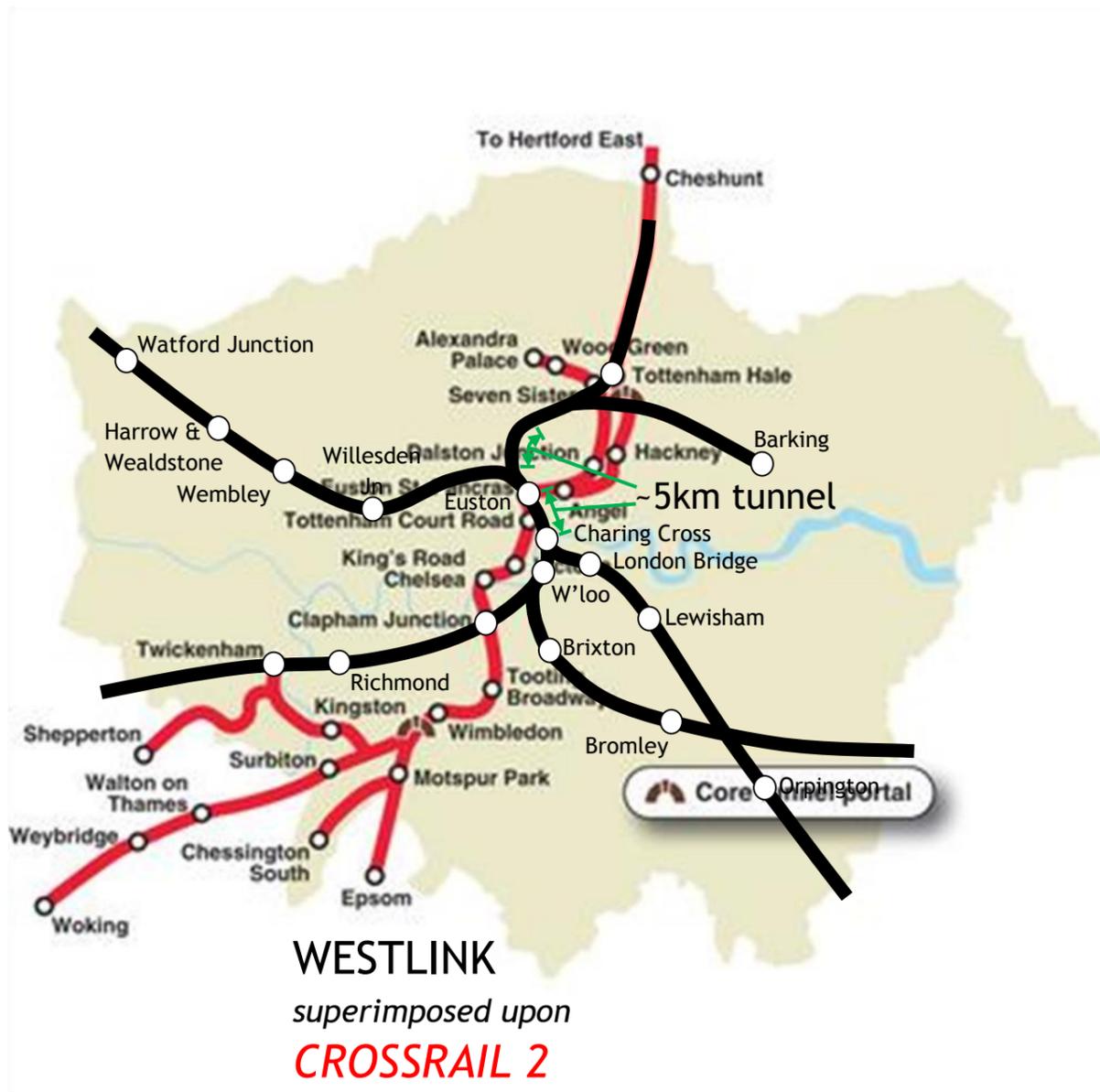
DIAGRAM **CLC 2**
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CENTRAL LONDON RAIL CONNECTIVITY
 'WESTLINK' PROPOSAL
 INTEGRATED WITH OTHER
 LOCAL RAIL SCHEMES

DIAGRAM **CLC 3**
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WESTLINK & CROSSRAIL 2:
ROUTEING COMPARISONS

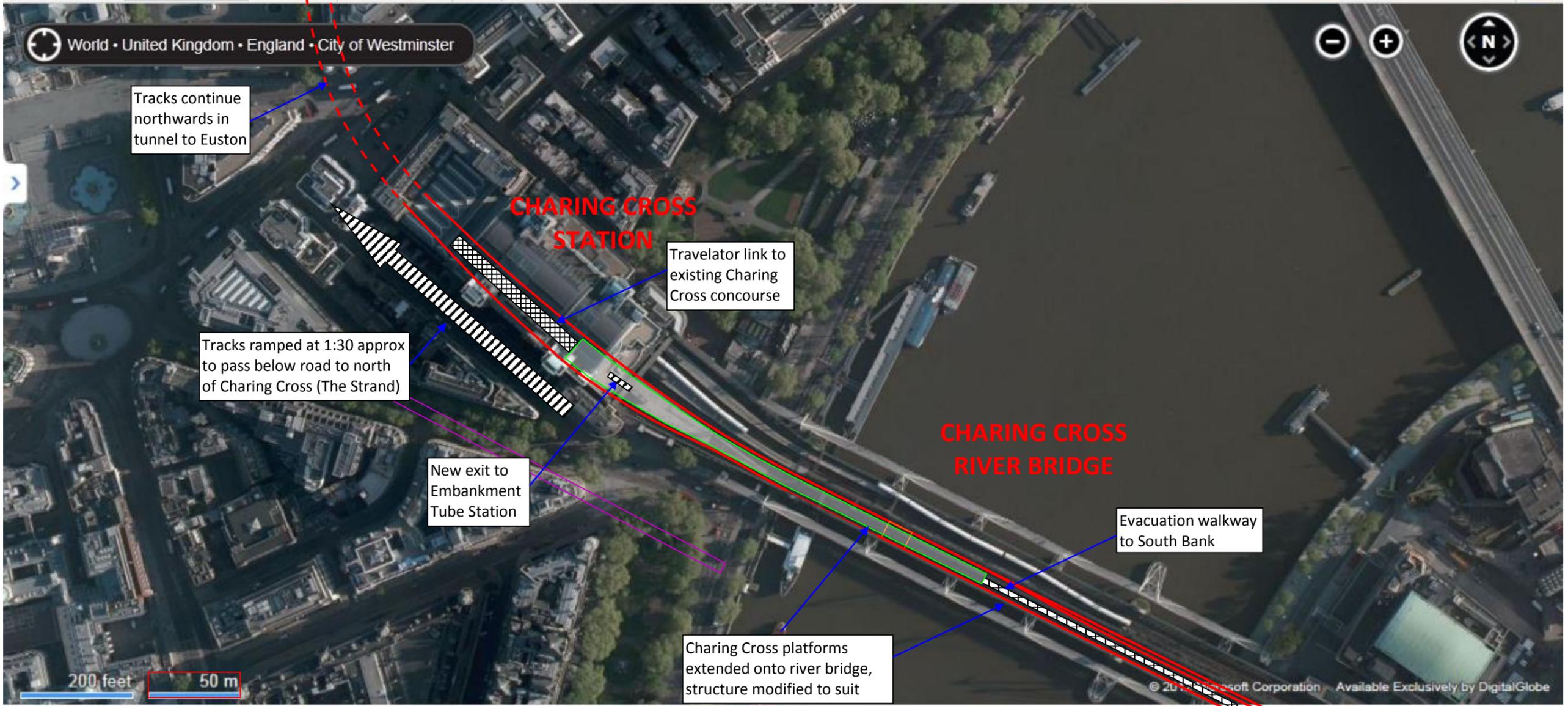


DIAGRAM **CLC 5**
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WESTLINK :
 PROPOSED WORKS FOR TUNNELED ROUTE
 NORTH FROM CHARING CROSS STATION

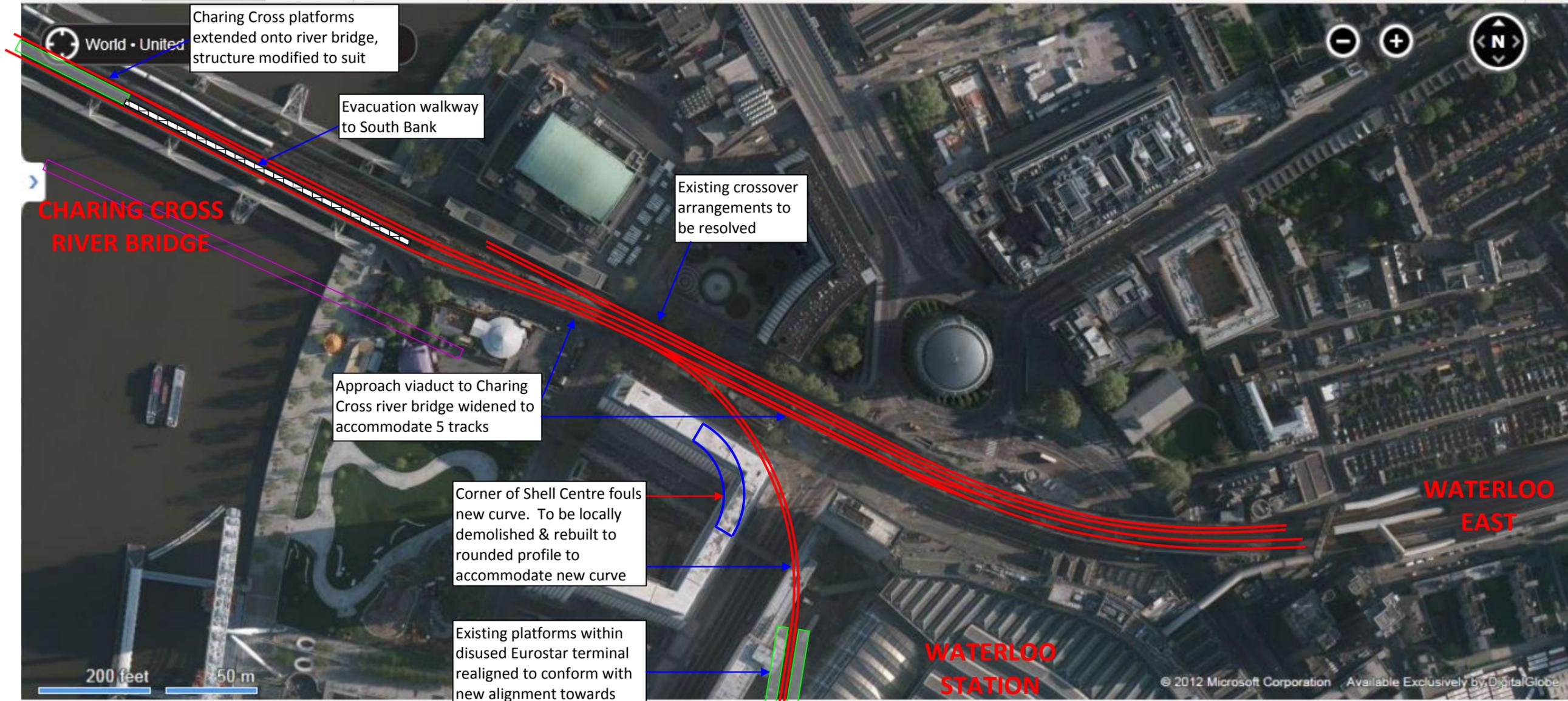


DIAGRAM **CLC 6**
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WESTLINK :
 PROPOSED WORKS ON SOUTH-EASTERN APPROACHES TO CHARING CROSS BRIDGE

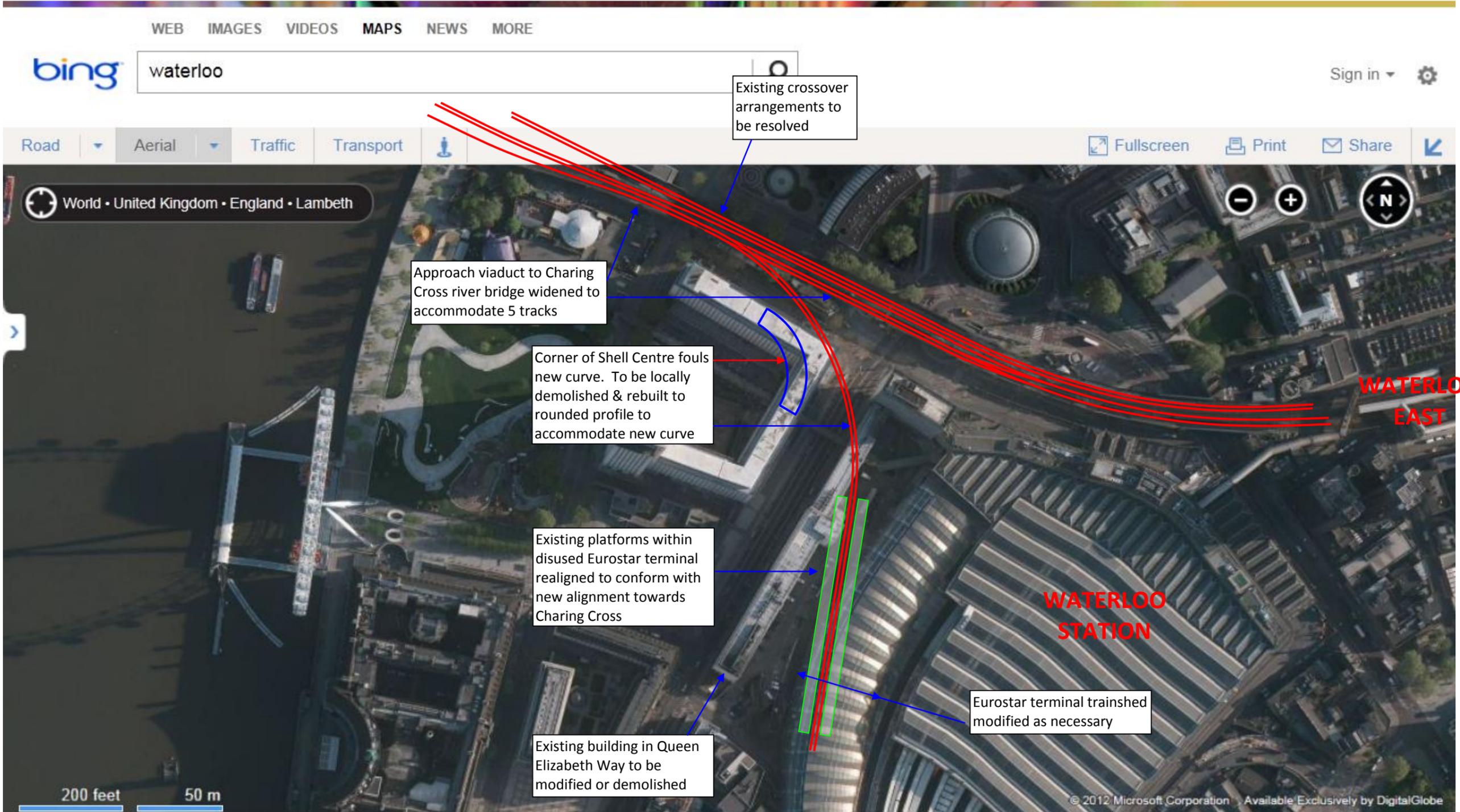


DIAGRAM **CLC 7**
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WESTLINK :
 PROPOSED WORKS FOR NORTH SIDE
 ENTRY INTO WATERLOO STATION

The case for investment in Light Rail in London

[contact redacted]

About the author: [redacted] is a transport analyst. He worked at the Confederation of Passenger Transport (CPT), representing light rail and tramway operators. Before that, he worked on public transport at the Transport Research Laboratory, including a study of the light rapid transit and urban development and on the effects of rail investment in Tyne and Wear and Glasgow. Since retiring from CPT in 2012 he has continued to work with UKTram, and represents the UK on a EU-funded study of urban tram safety in Europe.

The National Infrastructure Commission has called for evidence on three major national challenges:

- Improving connectivity between cities in the north of England,
- Large scale transport infrastructure improvements in London,
- Improving how electricity demand and supply are balanced.

This paper addresses the second of these challenges and examines the case for investment in light rail and modern tramway systems in London.

What light rail can do

Light rail, and in particular a street-running modern tramway, is a modern transport mode which uses vehicles which run on rails but which are lighter than traditional rail vehicles. This enables higher acceleration and deceleration, steeper gradients and sharper curves than on a railway. Hence stops and stations can be closer together, providing a better urban public transport service. The capability of running in the street, either on its own right of way or mixed with road traffic, means the infrastructure can be lighter and less intrusive, requiring less in the way of bridges and tunnels which, of course, makes it less expensive. Light rail is normally driven by electricity, making it non-polluting at the point of use and able to use power generated from sustainable sources. Also, modern trams generally allow level boarding, which makes boarding easier for people with disabilities.

A modern tramway can carry between 4000 and 10,000 passengers per hour in each direction (pphd). This means it has a much greater capacity than a bus service, which is limited to about 3000 pphd by the need to stop, start, load, unload, accelerate and decelerate. In a large city, buses do not provide adequate capacity.

Several cities in the British Isles, including Manchester, Sheffield, Dublin and Edinburgh, have installed modern tramways. They are successful at carrying large numbers of passengers, attracting car drivers, and promoting urban regeneration. In London, the tramway in Croydon and the Docklands Light Railway (which does not run on-street but is classed as light rail) have both produced similar benefits.

The case for light rail in London

In this paper we look at the scope for light rail investment in London.

Currently, London is experiencing a great deal of investment in its rail services. Crossrail is being built and will carry passengers between Paddington in the west and Liverpool Street in the east from 2019. Crossrail 2, linking the north-east and south-west, is under development. Extensions are planned to the Bakerloo and Northern lines, and the Docklands Light Railway undergoes continuous development. In recent years, sections of underused rail lines have been linked together to form the Overground network, serving mostly circumferential routes. These improvements have been, or have the potential to be, very successful.

Of course, rail improvements are enormously expensive, and, as this paper shows, do not serve all needs. We believe that public transport investment can also be effective at a more local level, providing short-distance, readily accessible, public transport both in central London and in district centres in the London area.

Why London needs efficient rail transport

We start with the observation that London is a large city. This is obvious, but London is by far the largest city in the United Kingdom, and can be classed as a world-class mega-city, one of only two in Europe (Paris being the other).

Large cities depend on rail transport to bring people and goods into their city centres. One has only to see what happens when rail services in London are disrupted by strikes or weather: people cannot get to work and the city could not operate for long. Of course, London already has a good many rail lines. The Underground brings 3 million people into the capital every day, and the suburban railway brings another 1 million. In the course of a year, the Underground carries more than 1 billion passengers, as many as the whole of the national rail network.

Large cities also depend on rail to carry passengers within their city centres. The city centre of London – defined broadly as Zone 1 or the area within the Circle Line – is too large for walking. This makes London different to other large cities such as Birmingham or Manchester, where it is possible to walk across the centre in 15 minutes or so. London needs an efficient public transport network within the city centre.

Central London is of course served by the Underground, but even with the fairly dense network of lines in the centre, it does not serve all the major corridors. Furthermore, the time taken for a passenger to descend to the platforms and back to the surface makes the Underground inefficient for short journeys. Hence, many central area journeys are made by bus, and there are many intensively-used bus routes. But buses get delayed in traffic, and on some busy corridors they struggle to cope with the demand, as a bus corridor cannot operate at more than about 30-40 buses per hour.

Another feature of the size of London is that it encompasses a number of district centres which are sizeable centres in themselves. The London Borough of Croydon claims that if Croydon were not “embedded” in London, it would be Britain’s 8th largest city, surpassing Coventry and Wakefield. It is not alone; there are other

district centres such as Stratford or the Richmond-Kingston area which could make a similar claim. Such centres need their own public transport networks, and the density of their transport corridors means that buses alone will not suffice.

We would argue that there are busy corridors, both in central London and in district centres, which would be better served by a modern tram service, with vehicles that can carry up to 200 passengers and, given the right priorities, can provide a shorter end-to-end journey time. A modern light rail or tramway system would provide a more efficient transport system, less costly than Underground or suburban rail improvements, but able to cater for busier corridors than buses can.

Suggestions for where light rail should be considered

Where would such corridors be located? It would of course be for Transport for London to look at current flows, do the modelling and identify corridors for improvement, but we make some suggestions here.

Light rail in Central London

Firstly, in central London, the corridor from the **Euston-Kings Cross area to Waterloo** station is one of the busiest, but it is not well served by the Underground. A few years ago there were well-developed plans for a tramway called the Cross-River Line to serve this corridor. It would run from Waterloo, across Waterloo Bridge, and then follow Kingsway and Southampton Row to Euston before turning right along Euston Road to St Pancras and Kings Cross. North of Kings Cross, the line would serve Camden Town, and south of Waterloo it could be extended to Peckham or to Clapham Junction, relieving the overcrowded rail lines into Waterloo. The line was forecast to carry about 70 million passengers per year, more than any other tramway in Britain. **We recommend that the plans for the Cross-River Line should be re-instated.**

Secondly, **Oxford Street** has been identified as one of the busiest corridors in London. It is served by many bus routes, but there are so many buses that progress is slow – very often, it is quicker to get off the bus and walk. It is also served by the Central Line and will be served by Crossrail, but with only 4 Underground stations and 2 for Crossrail this hardly constitutes an efficient local service. A tram service between, say, Holborn and Marble Arch would provide better connectivity for Oxford Street shoppers, and it could be extended to Paddington to serve the mainline terminal. One drawback to the earlier Oxford Street tram plans was where to locate a depot, but that could be accommodated by integrating the Oxford Street tram line with the Cross-River Line and using a joint depot south of the river or in the Kings Cross area. **We recommend that the plans for an Oxford Street line should be re-examined.**

Thirdly, there are no Underground lines serving travellers between **Victoria and Paddington**, via Hyde Park and Marble Arch. Another heavily used bus corridor is that between **Victoria and the City**, via Parliament Square, Trafalgar Square and

the Strand. These corridors could benefit from light rail investment. **We recommend that TfL should examine the case for light rail investment on these and other densely-trafficked routes in central London.**

District centres in London

Among district centres outside central London, Croydon and Stratford are just two examples where investment in light rail could improve local transport. Neither is a rich area, and there are many people in these areas who are not well-off, or are even deprived. Their lives are far removed from those of the well-paid people who work in the City or shop in the West End, areas which they seldom visit. People in east and south London depend on public transport for access to employment, shops, schools and leisure facilities, and businesses depend on it for their employees and customers. Investment in public transport would be beneficial on many levels.

We have already identified **Croydon** as a centre which requires good public transport. There is an existing tramway in Croydon which links Addiscombe and Beckenham Junctions to Central Croydon and on to Wimbledon, carrying large numbers of passengers. **We recommend that the various plans for extensions to this system, including one to Crystal Palace, should be pursued vigorously.**

In east London, **Stratford** is a rapidly developing area with a large shopping centre. It is already well-linked to central London and other centres by public transport, with suburban rail, two Underground lines and two Docklands Light Railway lines. But Stratford depends heavily on buses in several corridors, notably eastwards along Romford Road and to the north-east towards Leytonstone. **We recommend that these corridors serving Stratford be examined with a view to installing light rail lines.**

In addition, there are other district centres within the London conurbation which have similar needs. Examples could include the Tottenham-Wood Green area, the Wembley area, and Kingston-upon-Thames and Richmond where a tramway could be developed to link with Croydon. **We recommend that all such areas which are currently served by heavily-used bus routes should be examined for possible light rail investment.**

Conclusion

In this paper we have suggested some areas, both in central London and in other centres within London, which should be considered for transport investment. Grand projects such as Crossrail and Underground extensions are fine, but they are expensive and take many years to develop; also, they do not necessarily provide the local accessibility that public transport needs. A modern tramway can provide high capacity transport which is safe, reliable and readily accessible to passengers, at a much lower cost than heavy rail or Underground investment. **We recommend that TfL examine the options described in this paper and others where light rail would be beneficial.**

Future investment in the London's transport infrastructure

Submission from: [contact redacted]

I do not wish to comment directly on future investment in the London's transport infrastructure.

That said, I do wish to **highlight the long term neglect of land drainage maintenance that leaves transport (and other) infrastructure liable to and at a steadily increasing risk of flooding.**

Very briefly.....

When the Environment Agency took over from the National Rivers Authority in the mid 1990's they disposed of the River Thames dredgers upstream of Teddington. Disposal facilities were closed and dredger operators dispensed with.

The £110m MWEFAS flood alleviation scheme was then constructed. On first use in 2003 the Jubilee River suffered severe structural damage. In spite of £5m in repair costs it is unable to convey its design capacity and is still falling apart today. The Thames downstream of Windsor flooded badlyin 2003 and twice in 2014.

The Environment Agency's current River Thames Scheme flood alleviation project is costed at £302m at 2009 prices. I have no doubt that this will be a £1bn if the project gets completed in 2025.

In my opinion this project is flawed in the same way that the Jubilee River was. The Environment Agency is unable to learn!

The really big issues are.....

- 1) The EA has no legal duty to maintain or improve the conveyance capacity of designated main rivers – so it doesn't.....
- 2) There are approximately 100 blocked flood arches upstream of Teddington – used as offices, workshops, warehouses etc. These reduce the discharge capacity of the system.
- 3) I have explained the problems to the EA and stated that..... if they implement the River Thames Scheme..... if they are lucky they will only flood Staines. If they are unlucky they will flood London.

Please feel free to contact me for further details

[redacted]26/11/2015

LONDON'S TRANSPORT INFRASTRUCTURE

Contribution to

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London – on road, rail and underground – including, but not limited to, Crossrail 2.

Introduction

In 2018 there will be two major infrastructure events, the opening of Crossrail and Thameslink, the biggest such schemes since the Channel Tunnel and Rail Link, and the upgrading of the West Coast Main Line.

The next major project to follow these is HS2. Due to open between 2026 and 2033, this dwarfs the other schemes. It will provide fast interconnection between many of the major cities of the Midlands and northern England. It will also free up urgently needed capacity on the existing main rail lines, rapidly increasing passenger numbers and freight.

The objective now must be to fully utilise the potential these projects have created. There are many transportation needs to be met, constrictions to be alleviated and pollution to be reduced. With tight budgets, integrated forward looking infrastructure planning is the only way to proceed.

The Elephant in the Room

Looming over much of Greater London's infrastructure forward planning is the lack of a decision on an upgraded or new hub airport capable of meeting the long-term needs of long distance travel; the elephant in the room.

The Airports Commission have recommended adding a new north west runway at Heathrow adequate to meet demand up to 2050. The Government have deferred a decision accepting these recommendations until a proper study of the impact of expansion on air quality and noise levels. Aircraft noise pollution already inflicts unacceptable misery on hundreds of thousands people in London who have repeatedly been told that new quieter aircraft will bring relief; the Airports Commission report shows otherwise. Even more serious for Heathrow's expansion is air quality. If studies show it is likely to exceed legal limits, then expansion cannot go ahead.

The Airports Commission admit their alternative solution, expansion at Gatwick, will not result in an adequate international hub for UK's economic future. The only real alternative to an expanded Heathrow, the one the Commission rejected, is the Thames Estuary site on the Isle of Grain. This was presented as having an unmanageable capital cost, partly due to the need for extensive new transportation infrastructure. This needs to be examined objectively in relation to the needs of other proposed developments in the same area.

Thames Gateway Regeneration Zone

The Regeneration Zone stretches forty miles along the estuary from Canary Warf in London to Southend in Essex and Sittingbourne in Kent. This concept is aimed at expanding London's economic activity along the Thames Estuary encouraging business enterprise, employment and new housing by providing improved infrastructure. It has succeeded beyond anyone's expectation in the Docklands at the western end of the Zone. It is undoubtedly in need of an employment catalyst to spread it eastward, together with improved rail and road links such as the extension of Crossrail eastward from Abbeywood and the construction of a Lower Thames crossing proposed to alleviate the lack of capacity at the Dartford Crossing on the M25. This will also overcome the barrier to economic activity between Kent and Essex.

London is desperately in need of additional affordable housing, either within the Greater London Area or outside with adequate commuter links. Thames Gateway Regeneration Zone can offer this once Crossrail is completed and the south spur extended.

The Employment Catalyst

It is hard to imagine a more effective catalyst to set in motion the regeneration of the Thames Estuary than the construction of a new hub airport on the Isle of Grains. There is only need for one hub to serve the UK and for a new one to succeed economically, the closure of Heathrow is a prerequisite. Employment priority would be given to Heathrow staff who are prepared to move near to or travel to the new airport. It can be anticipated that well in excess of 50,000 new jobs will be available for people living in the regeneration zone. A lower Thames crossing would spread the benefits to Essex.

Lower Thames Crossing

The Dartford Crossing on the M25 is already operating close to capacity. Studies have been carried out to compare providing extra capacity at Dartford with two alternatives further down the Thames. The appraisal report "Review of Lower Thames Crossing Options, April 2013" discarded the middle route. The lower route leaves the A2/M2 junction east of Gravesend and crosses the Thames east of Tilbury joining the M25 between junctions 29 and 30. Improvements to the A229 linking the M20 and M2 were also considered but were found to be very expensive for such a short road. The crossing and M20-M2 link are presently being studied on its own merits. In the event that the hub is to be constructed on the Isle of Grain, consideration should be given to building the link further west where it could also act as the main access route to the airport for airport traffic originating west of junction 5 on the M25.

Consideration should also be given to a combined road and rail crossing structure, although a separate rail tunnel will probably prove more economical.

Airport, Rail and Road Access

Heathrow has grown over the years with poor rail access, encouraging unacceptable levels of road usage, contributing to air pollution and congestion on roads leading to the airport. Closure of Heathrow would help solve both problems.

Infrastructure already in place would mean that rail links to a new estuary airport can be world class with little extra investment cost to be set against the airport alone.

- The extensions of Crossrail beyond Gravesend would provide a high capacity frequent service. Travel times of under one hour from Old Oak Common and ten minutes less from Tottenham Court Road would be expected.
- An airport link to HS1 would allow provision of express services in under half an hour on the “javelin” trains to Kent from St Pancras and Stratford. These trains are presently running 6 carriages whilst 12 are allowed for in the train design and platform length. The track has been built to UIC GC loading gauge which allows for double-decker trains which are being increasingly used on the Continent. There is definitely adequate latent capacity to meet the need for express travel to the airport. The two halves of the “javelin” trains can be separated automatically allowing even more flexibility.
- Of equal importance to the London links is the possibility to establish fast rail travel to other parts of the UK. With HS2 in place, many of the major cities of the north, Midlands and the west can be provided with a through service to the airport in under two hours. The main capital expenditure will be a direct link between HS2 and HS1. With this in place, up to four HS2 trains per hour could bypass Euston and stop at Stratford for Docklands, at Ebbsfleet to connect with Eurostar services, and terminate at the hub airport. There would be no loss of capacity to serve London, as passengers for other destinations could change at Old Oak Common onto Crossrail, avoiding poorly connected Euston. Passengers from the west would join at Old Oak Common.
- It has been assumed that HS1 has a maximum capacity of 16 paths per hour in both directions between St Pancras and Cobham before the Medway crossing. Of these, six could be allocated to Eurostar, six to “javelin” services and the remaining four to HS2. Beyond Cobham, there would be a lot of extra capacity allowing for freight services which would have to join the Kent lines into London, or use a new rail link to Essex if one is built. This would tie in well with the new London Gateway Port and Logistics Park already in use downstream of Tilbury. There would also be capacity for trains from the Continent to what could become one of the world’s best airports for range of international connections.
- The rail route to Waterloo, in use for Eurostar services before Phase 2 of HS1 was built, could be reinstated to provide an adequate semi-fast service to Waterloo. There is an extra-ordinary provision in the costs presented in the “Airport Commission’s Inner Thames Estuary Airport Summary and Decision Paper, September 2014” for a new express rail service from Waterloo via Barking Riverside bringing their enhanced rail package provisions to £26.9 billion! This, together with estimated road improvements of up to £17.2 billion, adds a £44.1 billion infrastructure bill to the airport development without any attempt to discuss what would be built in the without airport scenario. This approach to dismissing an apparently unwanted project would surely be more in place in a script for Yes Minister than a document intended to decide the long-term provision of hub airport capacity in the UK.

- The above rail access would be more than adequate to support a hub airport with capacity to meet demand beyond 2050. The demand on road access would be reduced to a much more manageable level than at Heathrow. A further route could be added if a rail tunnel is built at the Lower Thames Crossing. The north-eastern Crossrail line could be connected to the airport by a line from Romford or Brentwood. This would provide additional capacity but, even more important, would add resilience to rail access when maintenance is carried out on other lines.
- Thameslink, the proposed Crossrail 2 and the existing rail network could play an important part in providing acceptable linkage to the airport from the zone outside Greater London.

HS1 – HS2 Link

An HS2 Phase 1 report, Review of HS2 – HS1 connectivity and Rail Links to the Continent – November 2015, is now available. It suggests numerous tunnel alternatives that could connect the two lines, plus several involving passengers leaving HS2 trains at Euston and walking or being carried on travellers to St Pancras.

The only realistic solution which meets the simple requirement for HS2 trains to join HS1 and terminate at the airport is a variation of option R6. The pair of rail tunnels from Old Oak Common would bifurcate near Chalk Farm, with one pair to Euston and the other pair joining the HS1 line north of St Pancras before it enters the tunnel to Stratford. The bifurcation would be of a similar design to that already built on Crossrail near Stepney Green. The report rightly points out the difficulties this solution would meet at the St Pancras end, but probably no more difficult than those recently solved by Crossrail. The Thameslink canal tunnels completed recently under St Pancras should provide useful information on shallow tunnelling in the area.

Closure of Heathrow

The closure of Heathrow is inevitable if a new hub airport is built. Airport staff will be seriously affected if they are not able to move to the new airport unless good transport links are available. A grade separated interchange between the Great Western lines/Crossrail and HS2 at Old Oak Common would serve this purpose for a few years until HS2 and HS1 lines are fully utilised.

Many businesses have located near Heathrow to take advantage of the freight services it can provide. A freight consolidation and distribution centre should be retained there with a fast and frequent rail freight service established, if possible, to reduce road haulage between the two sites. Heathrow airport site, with its forthcoming Crossrail services, will be a prime site for commercial and residential development.

Overview

The delay in deciding whether to proceed with a third runway at Heathrow is a major impediment to preparing a long-term plan for London's transport infrastructure. However, this review suggests that most of the components needed to support a change in location of UK's hub airport, if it occurred, are already being actively progressed to meet other identified needs.

The only scheme warranting immediate action is the HS2-HS1 link tunnel. This should be studied in detail so that it could be built with HS2 Phase 1. Any other approach would be very short-sighted and hugely disruptive for adjacent rail services.

There is real need to reduce the strain on commuter trains into London and improve access to areas of more affordable housing which is rapidly disappearing from Inner London. Crossrail 2 can play a major part in this at a high price. This is inevitable for any scheme requiring long tunnels under London. A useful intervention would be a study covering the Greater London area and commuter links to identify which routes could carry double-decker trains without excessive infrastructure rebuilding.

The author regrets only noticing the call for submissions shortly before the closing date, otherwise a more polished presentation could have been made.

[name redacted]

Dear Sirs,

I consider that one of the aims of the NIC should be to link projects that can support each other or generate synergies, create economies of scale, or pursue other national or regional priorities as a byproduct, thus "killing two birds with one stone" and leveraging funding in the best possible way towards desired outcomes.

In particular, I am anxious that all future tunnelling projects should be linked with land reclamation schemes, so as to maximise the land available for other uses that are needed, including housing development or other infrastructure.

I would draw to your attention that spoil from the British sector of the Channel Tunnel was used to create an extension to the cliffs of Kent known as Samphire Hoe, which is now a unique habitat, nature reserve, public open space and tourist attraction.

Given the pressure on land for housing, green infrastructure, food production, energy infrastructure etc., I consider it vital that spoil from Crossrail 2, a Trans-Pennine Tunnel, and other similar schemes be used for seabed land reclamation in or near to existing cities or towns so as to create new footprints for high-value coastal housing schemes with sea views. The proceeds of sale of such housing would subsidise the original project, and it would help to meet the housing imperative without taking any greenfield land.

Yours faithfully,
[redacted]

Response to Infrastructure Commission Call for Evidence: Questions relating to Greater London:

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

Lack of housing, especially affordable housing within reasonable travel distance of employment and services.

Dependence on the private car, especially away from Inner London and, resulting from this:

The concomitant wasteful use of land (for roads and parking) that should otherwise be used for housing, other beneficial uses, biodiversity and flood mitigation;

Lack of opportunity (and safety) for walking, cycling and public transport, all of which would contribute to public health through less obesity, better air quality and less premature morbidity and mortality with significant effects on the costs of health care.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?

There have been far too many reports that have been shelved (e.g. the two immediate Post-War railway reports following the Abercrombie Plans, of which only a few fragments have been built, the proposals half a century ago for what is now Crossrail 1, the Bakerloo Line Extension, expected in the 1950s, and the inordinate delays on Thameslink "2000"). IMMEDIATE starts should be made on

- The elimination of bottlenecks on the radial rail network (e.g. E Croydon, Welwyn Viaduct, Clapham Junction and Woking [please see below])
- The provision of orbital or tangential routes serving outer London suburbs, town centres and locations beyond, on the model of Croydon Tramlink, and the provision of railway lines to improve connectivity (e.g. the Croydon link)
- The transfer of funding from increases in road capacity to public transport and traffic management, including the improvement of environmental conditions in neighbourhoods through the rigorous enforcement of (low) speed limits and restrictions on obstructive pavement parking etc.
- Crossrail 2 regional scheme and bringing forward radial line improvements such as reinstating four tracks in the Lea Valley and additional tracks on the SW Main Line.
- The safeguarding of land in rail corridors for improvement (e.g. if true, the reduction of the rail formation under Earl's Court on redevelopment to two tracks is incredibly short-sighted, given the likely capacity pressures on the West London route).
- Cross River provision downstream of Docklands to link **rail** services for passengers and freight north and south of the Thames (rather than the current preoccupation with road traffic crossings).
- Planning for a direct through link from HS1 to HS2, so that Old Oak and Stratford can play a fuller part in distributing national London-bound traffic, and direct Continental services can be provided from Birmingham and Manchester without stopping in London – both relieving Euston and bringing the "Northern powerhouse" to reality, rather than just adding to Central London congestion.

I also advocate in particular an orbital link for West / South West London which I have put forward in the SW Route Utilisation Strategy consultation – please see the **Appendix** to this note, which considers some of the wider issues related to the M25 corridor in this sector.

What might their potential impact be on employment, productivity and housing supply in London and the southeast?

Although the Commission is not including Airports in the request for comments, it has to be faced that a wrong decision here would make infrastructure provision well-nigh impossible. In particular, the huge housing demands from increased economic activity that a third runway at Heathrow would require would be unsolvable. The public's resistance to the development that would be needed on the green belt and beyond (including AONBs) and the near-certainty that air quality considerations would mean lengthy legal challenges would result in a collapse of planning in west London and beyond and affect London's performance as a whole. (It must be recognised that the Heathrow T5 Inquiry was unequivocal that T5 should be the last major airport development there).

Conversely, the early use of land currently blighted by proposals for the third runway for housing and integrated transport (building on present routes like Crossrail 1) could go a long way to make an impression on the SE's current long-term housing supply deficit, and safeguard areas beyond Greater London from over-development likely to be unsupported by infrastructure which is currently fairly poor.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Better integration with regional rail routes, e.g. Lea Valley / Stansted and SW Main and Suburban routes, to reduce congestion at London termini and provide more journey possibilities, plus widening as suggested above.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

- What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?
- What innovative funding mechanisms could be considered to support delivery of key schemes?
-

From the land development of the first Metropolitan Railway, through the development of the New Towns, to the proposals for infrastructure financing worked out for example in the Cambridge Growth Corridor in the late 1990s, many proposals have been made for how development might be financed, mostly involving the capture of future land value benefits to assist current development. Proposals along these lines have been made by many of the professional Land and Planning bodies, who can be expected to be presenting them to you. The obstacles seem to be more "political" philosophy than practicality!

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

I do not have direct information on these issues.

londonevidence@Infrastructure-Commission.gsi.gov.uk

Appendix:

The following response to the Wessex Route Study Consultation, made in February 2014, considers the application of some of the issues raised in the Commission's questions, and makes a specific proposal for an orbital rail route to improve infrastructure in the SW and W London and the M25 Corridor.

1. This is an individual response by a resident of Woking. I have a particular interest in the consultation as I am a retired town planner who has had direct responsibility over the years for, *inter alia*:

- Strategic planning, environmental and planning appraisal techniques for large infrastructure projects and sub-regional plans
- The interrelationship between transport and land use, including the geographic and time – accessibility of different modes of transport
- Specific policy issues relating to the needs of industry, the roads programme and rail freight (including at one time re-writing the Freight Facilities Scheme Manual)
- Working (successfully) to bring forward the proposals for South Hampshire electrification by identifying socio-economic benefits, so that the scheme was implemented earlier than originally proposed by the then railway authorities
- Regional planning – including RPG3 (London) and RPG9 (for the wider South East). This included ensuring that strategic reference was made in RPG3 to Crossrail and Chelsea-Hackney (when transport colleagues in government were advocating dropping both!)
- Housing demand and supply in these regions and subsequently the national growth area proposals
- The 700 conditions attached to the Heathrow Terminal 5 decision (as part of the T5 decision team).

2. I am not a railway industry expert, so please forgive any misuse of railway terminology in this response (I have however been a close follower of modern railway matters for over 50 years, and a regular rail and rapid transit user). However, I would like to record at the outset that the consultation document is admirably clear and readable.

3. This response concentrates on the SW Main Line and the potential for an outer orbital London rail service, for this is where I believe the greatest challenge and opportunities lie. Following general observations on the Study as a whole, I advocate the early implementation of:

- Grade separation and additional platforms at Woking and
- An orbital route from Guildford to west London via Heathrow, mainly on existing tracks or following the M25 – which I have termed “Airtrack plus”

General observations:

4. The Route Study appears to be concentrated on the current problems of congestion and ways to squeeze capacity out of a system running at a level which is less than wholly resilient (giving no room for even minor upsets in service). There is clearly an operational and “political” need to address this, but the danger is that opportunities for growth in rail usage and coverage are ignored. Major

timetable changes, new stock and train lengthening has ameliorated conditions more recently for the outer suburban services, (but often at the expense of frequencies of the inner suburban, as a comparison with published timetables from 50 years ago will show). Nevertheless, as is well recorded in the Study, overcrowding is rife and action is needed beyond mere tinkering even to maintain the status quo amongst a growing population.

5. What the Route Study underplays is the potential for further growth in rail traffic if current constraints on journeys (including journeys that cannot at present be made by efficient public transport) were eliminated. Transport demand modelling – and to some extent the current franchise system – tends to concentrate on existing flows and congestion, and underplays the potential for new journey opportunities. Derived demand approaches completely ignore the established contribution that, for example the “tubes” gave to the development of the London suburbs and the Metropolitan Railway did for “Metroland”. Planners have long known that improvements in accessibility can bring increases in usage. The growth of traffic on the SW main line has been well recorded. Past capacity increases have stimulated growth – the effect of electrification of the Southampton line and resultant reduced journey times was particularly marked in the Twentieth Century and stimulated commuting and development along the corridor.

6. Today there is a welcome recognition of the development opportunities of new transport links – redevelopment around Crossrail stations being an example – but transport planners still tend to belittle attempts to create new markets. An example is the history of the Overground, which, when first mooted (as RingRail) in the mid C20, was rubbished by transport planners as having no demand and by railway operators as completely infeasible. Indeed, transport planners at the time were seriously contemplating using the trackbeds of the supposedly redundant lines for urban motorways [I was involved in assessing the quite devastating impact of these routes]. The work of the new Deputy Mayor and others in the more recent GLA facilitated the development of the Overground, and its attractive services have led to the original concept being overwhelmed by passengers, so that trains and platforms have needed to be lengthened and frequencies improved.

7. A simple example of suppressed demand today is Clapham Junction, where the non-stopping of Main Line trains throughout the peak means (from timetabling and platform constraints) that otherwise entirely feasible journeys to such major traffic attractors as Croydon or Inner West London just cannot be made from main line stations as the interchange is not possible. Here, the issue of current capacity and future opportunities overlap – as dealing with one could unlock the potential and generate increased traffic (and revenue) to a wider range of destinations.

8. I would like to see an immediate Improvement of Clapham Junction. Pending a major rebuild, urgent consideration should be given to the conversion of the current Up Fast line to Fast Reversible, with platform extensions and the relief of severely restricted turnouts to platforms 7 and 9 to enable a reasonable number of peak hour direction main line services to call there (and be overtaken by non-stopping services if necessary). This should take place irrespective of the decision on Crossrail 2 (I support the earliest implementation of the regional scheme and additional tracks west of Wimbledon.)

9. A more difficult, but pressing, issue is the traffic opportunity of outer orbital services, represented (by road) by the M25 corridor, which in my view is an opportunity for rail waiting to be grasped, preferably immediately (please see below).

10. Capacity restrictions also inhibit the construction of new stations, on which the Study is silent. I assume that they have been ignored, from the statement given in section 3.6 *other conditional outputs*. However, there are significant opportunities for enhancement of the connectivity benefits

of rail and of attracting traffic at such locations as Burpham and Park Barn (both in Guildford) and these should be included as an early planning aim. These two, from the point of view of the local areas served, are well overdue. Others should be investigated, for example, Stoughton (Guildford) and Sheerwater (Woking – in tandem with current regeneration proposals).

11. It is understandable that, given the physical restrictions on train movements, train lengthening is the first resort of operators (or more fanciful ideas such as double decker carriages as expressed in section 6.3). However, lengthening is probably reaching its practical limits for suburban services, whilst it should also be remembered that the attractiveness of public transport in suburban areas increases as frequencies increase. (Waiting and Interchange times are “valued” more than in-transit time). A Turn Up and Go service is necessary to be attractive to users, as seen most dramatically on the growth in traffic on the London Overground and some “Metro” services. It is therefore encouraging to see the Study examining the potential for enhancing the services over the day. Southern Electric managers considered 20 minutes to be the maximum waiting time without journey planning using timetables. In today’s faster, more instant, world, a frequency of 15 minutes or less would seem essential for non-rural services.

12. Most of the significant proposals of the Study are over the longer term, yet, as we have seen in the past, rail planning has been bedevilled by delays, prevarication and abandonment. The post war plans for cross-London RER main line tubes following Abercrombie (the Greater London Plan) were never implemented (e.g. main line tube F became a watered down Jubilee Line, the Northern Line New Works including taking over some SW suburban branches were abandoned). Major proposals for two E-W lines in the London Traffic Study were forgotten, and – as I mention above – Crossrail was very nearly abandoned too. It is clear from the Study that the current – welcome – proposals for capacity are quite insufficient to provide a resilient service for just the current passenger forecasts – let alone suppressed demand – and that major capacity increases are required immediately. Comparisons with the provision of infrastructure in other World Cities show London and the SE to be incredibly slow, notwithstanding the fact that where there is a will, infrastructure can be implemented relatively quickly (the DLR and Overground extensions being examples).

Relief of congestion at Woking

13. I believe that the flat junction at Woking largely determines the pattern of rail services on the entire SW Main Line, and it seems highly unlikely that the service through this junction could be improved without major work. As the Study points out, existing services through Woking are already seriously overcrowded. Without commitment to improvement at Woking, the only possibility for the SW Main Line (long distance services) seems to be the diversion of a few of these at Basingstoke to Paddington, building on the freeing of capacity on the GW Main Line by the rebuilding of Reading and the platform space at Paddington freed by Crossrail. Whether this could provide an adequate level of capacity without further major expenditure seems doubtful, and would do nothing for the growth in traffic over the Portsmouth, Alton and Basingstoke Line corridors. The construction of Platform 3 at Woking has been a palliative for terminating services, but entails conflicts with the fast lines and additional congestion on the approach to Woking, as many travellers already experience.

14. Woking is therefore the key to both improved rail services throughout the SW Main Line and the additional services needed to support Surrey and Hampshire. There is an additional opportunity to use this capacity to facilitate an orbital service meeting the unmet demand for access to Heathrow and the West of London (see below). In addition, planned proposals for development in Guildford,

Woking and the Blackwater Valley will add to travel demands. Significant commercial and residential developments are already proposed in the sub-regions, recognised in the Local Plans (emerging or adopted) for the area. It is very doubtful whether this level of growth can be sustained on the basis of road traffic alone without severe environmental and congestion implications, themselves fuelling strong opposition to any proposal for growth.

15. The draft Surrey Rail Strategy set out various proposals for additional rail services using the SW Main Line, but none would appear feasible without increased capacity at Woking (with the exception of a proposed terminating service into Platform 6 from Gatwick).

16. I therefore strongly support the Study's proposals for capacity enhancement at Woking by a flyover and extension of Platform 6 to be a through platform (section 6.1), but would advocate consideration of further enhancements, specifically the provision of, or passive provision for, a second additional through platform. Work on this should start as soon as possible.

17. Although development has encroached on some land that might be used for major improvement – which can be seen as incredibly short-sighted by both the past rail authorities and the planning authority – the potential still exists, helped by the fact that the Victoria Way bridge is multi-tracked, and there are abundant railway lands around the station area. It seems perfectly feasible for two new platforms to be located on the southern side of the station on the the up side, continuing the existing Platform 6 track and adjoining siding. In order to reduce impact on the Centrium residential complex, the platforms would begin at about the site of the present booking hall, but would extend over railway lands in the London Direction. (If necessary, appropriate screening of these approach tracks could take the form of a “green roof”.) There may be issues on the historic façade of the booking hall, but this could probably be rebuilt and incorporated in any new development. There is considerable potential for development over the station.

18. Proposals already exist in principle for a new development at the station to provide a bus interchange. Woking Borough Council has an entrepreneurial approach to development, as seen in the extensive proposals for further development of the town centre, and development of the airspace above the station could contribute significantly to its enhancement. A local advantage of any development could be the replacement of the totally inadequate public subway under the station by a convenient over-deck starting at grade from the existing station forecourt, leading to access to the town centre by escalator or lift and incorporating an over-track concourse (itself facilitating retail opportunities for the railway).

A proposal for an orbital railway for Outer West London –“Airtrack Plus”

19. The study refers in passing to the Southern Rail access to Heathrow (section 2.1.5), but in my view misses the much greater case for an orbital rail service, based mainly on existing tracks to link major traffic generators throughout the SW and W London sectors. At present, it is almost impossible to move around Outer SW and W London without going by private road vehicle. There is constant pressure to widen the M25, and the issue of air pollution (see below) is additional to the carbon contribution of road traffic, which is significant in contributing to climate change. The almost total dependency on roads also has considerable repercussions for the structure of the Western and South Western approaches to London, with spreading congestion adding to business costs and sprawl inhibiting efficient and sustainable land use patterns. This is not just a Heathrow issue, but one that affects all the major traffic generators and town centres in the sub-regions.

20. There may be a procedural difficulty, in that consideration of an orbital service is wider than the remit of the SW Trains Alliance, and falls into the category of cross boundary services (chapter 4), which clearly do not exist in this corridor at present. However, improved rail access to Heathrow and beyond is long overdue, and should be seen as a component of a transport strategy to facilitate orbital movements by integrated public transport - movements which can only at present be made by private road transport (with the exception of the rail air coaches which provide a minimal premium service to small numbers of passengers between the airport and selected stations). Moreover, the key to such a service is capacity at Woking and around Staines – both SW Trains’ territory.

21. In addition to the geographical attractions of giving access to major traffic generators – which is recognised in in the Study as “conditioned outputs” to existing stations but not potential new services – there is the issue of externalities and benefits, which do not seem to have been explicitly considered. There is a very strong case for including in any work on rail service assessment the many environmental benefits delivered by electric railway – from less polluting power supply to lower land take than other forms of transport. The main motorway corridors are significant contributors to poor air quality in outer SW London. There are dangers in underplaying the polluting effects of transport, and not just in respect of breaching European Directives designed to minimise the harm to the health of the population. The Environmental Audit report (HC212) in its recent overall conclusion, states:

Urgent change is needed in transport and planning policy to save lives and ensure that the UK meets European safety targets much sooner than the expected dates indicated by Defra. Air pollution is an invisible killer and a public health imperative. A fresh approach is needed for the health challenge we face, coordinating action by local authorities and communities as well as the Government.

An effective orbital rail service taking traffic from the M25 in particular would go a long way to mitigate the adverse effects of unrestrained road traffic in this sector of the South East.

22. Air quality is of particular concern in the area around Heathrow. It is not generally known that Heathrow T5 only just received planning permission. Senior officers of the government departments concerned considered that there was a very high risk of successful legal challenge from opponents, because of the effects of the environmental impacts of the terminal and its associated infrastructure. In particular, the combination of aircraft and road traffic had a wholly unacceptable result on air quality. This was resolved in the ministerial approval by the requirement in the planning conditions of an air quality management plan. It was also envisaged that some of the pollution from road vehicles would be mitigated by the transfer of trips to rail. In addition to the requirement to extend the Heathrow Express and Piccadilly Lines, specific provision was given in the conditions for a provision in the T5 station box for rail access to the west / south west, where the current modal split was particularly poor. In the event, the rail access was not constructed and air quality remains appalling in the M25 and M4 corridors. (The relevant files were declassified on the publication of the T5 decision and should have been kept as a historical record of the longest inquiry.)

23. Over the years, various proposals have been made and abandoned for rail access to Heathrow. SWELTRAC, Airtrack, the Western Connection and others have been made. These proposals have been seen as a means to serving the airport alone, not for more general travel, so they had limited objectives and potential. Airtrack in particular was conceived as a small addition to the existing infrastructure, with links to Guildford and Staines. It was not surprisingly abandoned in the light of the opposition of local interests in Egham and Staines objecting to more frequent closures of level

crossings, and the limited scope for services - curvature of the track at Staines and Virginia Water, the inherent limited track capacity of the Windsor lines through the junctions, and the almost complete lack of capacity at Woking meant that it would never have been a sufficiently attractive service, especially at commuter rush hours. However, the need has been recognised for years, and is there now, not in some far flung control period future.

24. A revived, but extended “Airtrack Plus” route as part of national railways (not an airport concession), serving destinations both south and north of the airport would have two benefits:

- It would mitigate the pollution caused by the road traffic emanating from Heathrow in the short term, as well as providing an alternative to road traffic over a much larger area (including the opportunities for easy interchange to the main rail radial lines)
- It would provide a resilient solution to movement around the West and South West of London in the medium to long term. Whether or not Heathrow was extended, it would provide rapid and frequent services across a wide catchment to HS2 at Old Oak Common (and then proposed development area around it), as well as facilitating future urban development over the Heathrow site (or land to the north of Heathrow) were Heathrow to be wound down.

In addition, if Crossrail 2 goes ahead, and / or Waterloo and its approaches are remodelled, relief will be needed during the period of construction to the South West Main Line, which could be provided by services via “Airtrack plus” to inner West London and, if necessary, Paddington.

25. Whether or not Heathrow expands, there will be significant demand in the M25 corridor for access from the west and south west for the foreseeable future. Even if the Airports Commission does not recommend an additional runway at Heathrow, the existing airport will continue to be busy for years, and modal split from the west and south west is already very poor – a high quality rail service would be attractive. On the chance that (as the London Mayor and some strategic planners such as the TCPA have suggested) Heathrow is wound down in the longer term and replaced by a new town, the significant housing and commercial development would provide many traffic opportunities for rail in all directions – not just to central London (as at present). The background “planning parameters” for an orbital railway are therefore very robust.

26. I therefore propose a semi-fast orbital rail service from Guildford via Woking to Watford Junction and Brent Cross (and other destinations) as suggested in the annex below. The proposal is compatible with possible through running of Crossrail to Staines or any SW Trains Southern Airport access arrangement, as well as any possible Crossrail branch to the London Midland lines through Watford Junction. It would replace the less reliable Rail Air connections by coach. Clearly, some of the existing rail infrastructure is inadequate, but with comparatively modest improvements as noted below (especially in comparison with other major rail and road schemes) many benefits would be unlocked. Capacity improvements are in any event either in train or necessary on existing radial lines that would mean that the incidence of costs would be shared and not wholly attributable to “Airtrack Plus”. The extensive opportunities for interchange with local and main line rail, Underground and Overground, coaches and local buses, would enable very many journeys to be made that are not feasible at the moment, as well as giving opportunities for rail access from other destinations to main centres and traffic generators, many of which are now only accessible by road in the orbital corridor.

Annex: A proposal for an orbital railway

The Core Service for planning purposes would be 4 semi-fast trains per hour over the central section (Woking to Acton Wells/Old Oak Common). Much of the route already exists, but construction is needed at the main junctions and a section by-passing Staines. Additional local services would be provided from the interchanges (many of these local services already exist as part of radial services).

The core route would involve a semi-fast service calling at the following stations:

Guildford: Interchange with Portsmouth, Redhill – Gatwick lines and Blackwater Valley local services. Major town centre, hospital and university town.

Woking: Interchange with SW main lines to Salisbury and Southampton and outer suburban services. Major town centre.

Chertsey: Interchange with Weybridge – Staines services. Major hospital nearby could be served by short bus shuttle.

Heathrow T5: Interchange with proposed Heathrow – Reading service and possible “AirtrackLite”/Crossrail extension to Staines. International Airport.

Heathrow Central: Interchange with Piccadilly Line.

Hayes and Harlington: Interchange with Crossrail and Thames Valley services. Crossrail regeneration potential.

Ealing Broadway: Interchange with Crossrail, Central and District Lines. Major town centre.

Old Oak Common (Acton Wells): Interchange with HS2, Crossrail, Thames Valley and Great Western Main Line, potentially also Overground. Significant future national transport interchange and redevelopment area.

The core service would then split into routes to:

Wembley Central: Interchange with London Overground, Bakerloo Line and potentially London Midland local services (again possibly Crossrail in future). Town centre and international sporting facilities nearby.

Harrow and Wealdstone: Interchange with London Overground, Bakerloo Line and London Midland local services / Crossrail

Watford Junction: Interchange with West Coast Main Line, Metropolitan Line (committed diversion), London Midland and London Overground. Major town centre.

And [via Dudding Hill line]:

Brent Cross (proposed station): Interchange with Thameslink and potentially East Midland services. Major retail centre and redevelopment area.

Potential extensions of services and options:

Basingstoke – Farnborough – Woking

Gatwick – Redhill – Dorking - Guildford

Brent Cross – Mill Hill Broadway – St Albans – Luton Airport – Luton (Major town and airport)

Watford Junction – Hemel Hempstead – Bletchley – Milton Keynes. (Major town and links with E-W rail corridor)

Main Infrastructure Requirements (apart from possible signalling and pointwork where needed to enhance track capacity and subject to detailed engineering studies):

Guildford – potential additional platform already under consideration

Woking – Flyover and additional through tracks and platforms (as discussed)

Chertsey – Heathrow: A new line following the M25 from the existing M25 rail overbridge to the Heathrow T5 station box. The most sustainable solution would be tracks built on the inside lane of the M25, as the capacity of a railway is far higher than a lane of road, although this might seem, under current policies, outlandish! Politically, construction alongside or under the alignment of the M25 is likely. As tunnelling expertise has advanced, this is probably the easiest solution, as we have seen on the Northolt section of the HS2 proposal, and would be plain tunnel, so would not involve any expensive station construction on route.

Acton Wells: New station with interchange to Old Oak Common, and either connection to Euston AC slow lines NW of Willesden or additional tracks to join DC lines at Wembley Central.

Brent Cross: provision for platforms on existing freight lines (which join slow lines at Silkstream Junction)

[redacted]

Friday, January 8, 2016

London's transport infrastructure: Big Picture Stuff

A personal view

By email only to londonevidence@Infrastructure-Commission.gsi.gov.uk

I am pleased to provide this brief submission to the Commission's call for evidence.

As a Director of Ove Arup and Partners I led the team responsible for persuading the Government to abandon British Rail's proposed alignment for the Channel Tunnel Rail Link, and which subsequently designed and constructed what is now HS1. This has in large part been responsible for the success of the Olympics, the regeneration of Stratford and King's Cross and the transformational effect of the Javelin high speed domestic services.

As a Director of Heathrow Hub Ltd and Runway Innovations Ltd, the companies responsible for promoting the extended runway at Heathrow, one of three viable options shortlisted by the Airports Commission and now under consideration by Government, I believe there is a compelling case for a similarly integrated approach to airport expansion and surface access. For me, this is a critical element in the Commission's consideration of strategic options for future investment in large scale transport infrastructure improvements in London.

I understand the political challenges but believe the omission of HS2 and airport capacity from the Commission's consideration is unfortunate to say the least.

For example our privately promoted integrated proposals allow;

- phased delivery of additional airport expansion aligned with demand, air quality and noise targets and surface access capacity,
- lower capital cost allowing all necessary and airport related surface access infrastructure enhancements to be privately funded,
- Crossrail Express services to relieve capacity constrained Great Western Main Line long distance services, increasing commuter capacity in the western corridor and maximising Crossrail's operational efficiency to the west of London,
- New cross-regional through rail services between Basingstoke, Guildford, Woking and Paddington, (via Heathrow), relieving capacity constrained South West Main Line services and congested LUL services from Waterloo and providing passengers from the South West with a direct connection to Crossrail.
- Extending Piccadilly Line services to connect to the Great Western Main Line and Crossrail at Heathrow Hub

This integrated approach is capital effective and revenue positive, providing benefits to both airport and non-airport passengers. It also provides the significant impacts on air quality and carbon emissions that is secured by modal shift from car to rail, not only in the event Heathrow is expanded but also as it continues to grow incrementally as a result of increasingly large aircraft and load factors

In contrast, current plans require significant public monies to deliver sub-optimal results. HS2 intends to fund a replacement depot for Heathrow Express, maintaining this premium service which uses 20% of Great Western Main Line capacity whilst achieving maximum load factor of 30% in the three hour am peak.

The proposed Western Rail Access to Heathrow scheme will, on the Airports Commission's analysis, achieve even lower load factors and will require continual revenue support whilst occupying increasingly scarce and valuable line capacity.

My plea is twofold. Firstly that the Commission brings creative thinking to explore potentially viable strategic options for future private investment in large scale transport improvements in the west of London which would make significant contributions to both the capital and the wider SE region. Secondly that specific attention be given to developing a scenario for sorting out the apparent problems and issues at Euston and Old Oak Common by seriously considering the benefits of the innovative Cross City Connect proposals developed by BuroHappold for a new rail tunnel linking west London with HS1 via a new underground South Bank Central Station between Waterloo and Southwark, with a potential future station in the Barking area before connecting with HS1 north of Ebbsfleet.

Integrated strategic leadership in all these issues is what many of us hope will emerge from the Commission's work! Obviously I would be happy to discuss this further with the Commission.

[redacted]

[contact redacted]

The views expressed by me in this very brief submission are personal and do not necessarily reflect the position of either Heathrow Hub Ltd or Runway Innovations Ltd

Dear Sirs,

As a professional in the transport and planning field, and an occasional user of the London transport infrastructure (mainly as a cyclist - its the fastest mode inside zones 1 and 2, and beyond), I write to offer comment on the call for evidence in respect of the London Transport infrastructure.

I think there are really only two issues in respect of London's transport infrastructure; the level of subsidy it attracts, and the level of provision. Both, in my view, are so disproportionate as to make the provision to all other parts of the UK, and especially the North of England (which for no obvious - or outstanding - reason has been singled out as lacking transport infrastructure), look pitiful. In fact, this is a misnomer. Transport infrastructure provision in the UK is simply being directed in several wrong directions at once. The actual level of infrastructure provision in London is significantly better than the rest of the UK, but its performance - ability to deliver - is almost equally abysmal as in any other major city. The reason is also the same; concentration of resources on the lowest modal utilisation (the car and conventional rail). These two prevent, in the case of the car, efficient use of the highway and goods delivery by the commercial vehicle, and in the case of conventional rail, restrict capacity, and the provision of that capacity, to perhaps 10% of the potential by the use of outmoded and very expensive technology.

In short, London does not have a problem caused by a lack of infrastructure, but a problem caused by lack of effective infrastructure utilisation. That is simply down to poor management, and since government has run UK transport, de facto since 1914, then it is a racing certainty that those - the great and the good of this evidence process - are at least partially culpable in that failure to manage the London land transport infrastructure so that it can deliver what London needs - fast, cheap, low carbon efficient transport for goods and people.

So investment in more of the same is not going to change anything; in fact doing more of the same de facto prevents change. Only doing something different will make a difference.

London needs to lead the world, not follow it. And it can do so easily on the simple level of planning to cope with the cycling revolution now in full flow in the capital; full provision as if the bicycle was the prime user of the highway, with junctions, priority, parking, recharge stations for assisted cycles, all designed to the exclusion - if required - of everything else. Think of it as we did for the motor car 1960 to 1990. Predict and Provide. Stop regarding cyclists as cads on castors (though a few undoubtedly are!) London's shape, as a structural basin, makes the ride to work downhill, on average, with the sweat reserved for the journey home. Makes Paris look hard work, which it is.

The bicycle on its own will do a lot for London, but it will not do everything, though the cost, less than a single rebuild of a mainline terminus, is eminently affordable. It will however, if properly designed, raise zone 1 and 2 transit speeds (door to door) for people from 3-4mph to about 12mph. Outside this central zone cycling will do more than any other modal shift to assist people and goods flows, but it will not address the medium and long distance people and goods flows on which the capital depends, and on which so much is proposed to be spent in addition to what has already been poured down the black holes of Crossrail, HS1, HS2, Crossrail 2 etc.

No current technology will square this circle, but something new will. Second Generation Rail (2GR). You won't have heard of it. It has nothing to do with rail, except the steel of the vehicle tyres and the material of the metal those tyres run on. It offers a solution to the issue of capacity - perhaps 10-fold over conventional rail - at perhaps 10% of the cost, and can be used on the public highway, or on reserved or segregated tracks with full door to door operability. It is equally amenable to freight or passenger, and requires no modal interchanges or special provisions such as large termini;

calculations suggest large termini would be inadvisable due to 2GR's theoretical capacity, even were they desirable. Over medium distances, say up to 120 miles, 2GR would be faster than the TGV and use perhaps 1% of the energy to do the same task. Based upon road vehicle technology, which has driven the western world's mass production for twelve decades, 2GR is only new in the way it looks at the issues of land transport, and the way steel wheels will run on rails; all the rest we already have in the technology drawer.

So London can choose; more of the same at enormous cost, or something new that will deliver what everyone wants at a price that all in the UK, not just London, can afford and acquire.

Yours Sincerely,

[redacted]

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

Unaffordable housing for all except Superrich Need 200+k/y to move to London

Jobs too centralised in Central London

Keeping London the most attractive city to live in the world (critical to maintain advantage as most businesses are based on low taxes and attractive for CEOs and company owners to live and school children

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

- How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?
- What might their potential impact be on employment, productivity and housing supply in London and the southeast?

Transport projects should connect new areas of development to new areas for housing so companies employees can choose a house where transport will be connecting to airports/or central connectors

Crossrail 1 and 2 mostly connect existing houses to existing offices, hence it will take a long time for those living to change their existing commuter routes to new jobs etc.

New centres of development at the edge of London or beyond should be planned to become hbs for certain business sectors options are Stratford/Croydon/Luton/Maidenhead Based on that choice transport should be build to areas for future housing
Trains/underground connected to airport/town centre should supplement this development.

Example: IjBurg development in Amsterdam: Bus (later) tramline was running to centre Amsterdam as soon as the first houses were completed, so everyone could plan their commute using public transport

Aix en Provence TGV station was planned in the middle of nowhere which is now a centre of new businesses between Marseille Airport and TGV Station Aix En Provence.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Build where new business areas and housing will be instead of in existing housing and business districts. The change of jobs will result in public transport being used in both directions and unload existing routes (instead of empty trains going out of London in the morning)

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

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- What innovative funding mechanisms could be considered to support delivery of key schemes? **See Q5**

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

Voorburg Netherlands constructed a road in a ground level tunnel (Sijtwende Tunnel N14) reducing noise, and making land available on top and next to the road for development largely paying for the tunnel. Imagine putting A3 in London into a tunnel with a train/tube line and selling the land above and right next to the tunnel for offices, cycle lanes, other public buildings etc.

I welcome the opportunity to respond to the National Infrastructure Commission.

[contact redacted]

London's transport infrastructure

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London has been fortunate to have had significant investment in public transport infrastructure over the past decade. However, as a world city growing at a very fast rate, transport infrastructure remains "behind the growth curve". A key part of the commission's work must be to build consensus on transport infrastructure to avoid rejection of bills in Parliament, as the original Crossrail bill suffered in 1994.

The delay caused by the 1994 rejection set back both Crossrail 1 and Crossrail 2. The result is that Crossrail 2 is effectively solving yesterday's problems, not preparing the city for the challenges of the future. However the worst part is that Crossrail 2 is being proposed with no view as to what large-scale schemes will be needed afterwards.

This is a critical flaw that must be rectified.

Question 1

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1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

The economy of London has become increasingly centralised, placing rapidly increasing demand on rail-based commuter services. The rise in housing costs in Central London only exacerbates the problem, with increasing numbers of people seeking to travel in from homes in zone 4 and beyond.

Two major schemes will alleviate this in 2018/2019 - Crossrail 1 and Thameslink. However, there is currently a gap of over 10 years to the opening of the next potential major schemes in 2030/2031 - Crossrail 2 and the Bakerloo Line Extension. It is entirely right to fear what 10 years of growth could do to the quality of commutes and safety of services. Ultimately, there must come a point at which bright, motivated people look elsewhere for a better standard of living. The danger is that 10 year gap between major scheme openings may simply be too long.

To put this in perspective, rail growth of 4% year on year results in a doubling of passengers in just 18 years. Since the opening of Crossrail 2 is 15 years away, it can be seen that the existing services in South West London may need to handle growth of 80% or more. It can be argued that this is simply not feasible, even if every seat is removed from trains.

Given the potential harm of relentless growth, the commission should consider whether London needs one or more tactical interventions targeted to open around 2025. One possibility might be express, no-station, tunnels for fast lines, which could be developed quickly as the lack of stations creates fewer planning or construction issues.

Another possibility might be tram systems for areas in zones 1 and 2 such as Hackney to Camberwell, again because tram schemes do not have tunnelling and can be progressed quickly.

It must be noted that the Network Rail long term planning process continues to highlight very high growth in demand on services beyond Greater London. It is already common to see standing for 60

minutes from places such as Winchester. Given the long distance rail infrastructure is at maximum capacity along the SWML (South West Main Line) and GEML (Great Eastern Main Line), there is real risk to economic growth.

(Maximum rail capacity on a two track line should be defined as 24tph (trains per hour) where each train is 12 carriages. While minor variations on this may exist, these maximums have been relatively constant for many years.)

Question 2

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2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

London does not have a vision for large-scale investments beyond 2030.

The impact of this on decision today is explored in the answer to question 3. In this answer, I will outline three potential strategic investments that could be considered.

Extending the Metropolitan and Crossrail 1 in South East London

The Metropolitan line terminates at Aldgate in the City of London.

This is a waste and a classic example of how areas south of the river miss out on metro services.

For the past few years, there has been a proposal to demolish and redevelop the site just south of Aldgate station. In my opinion, TfL should be taking advantage of this unique opportunity to prepare for an extension of the Metropolitan line to Abbey Wood.

The proposal would close the existing Aldgate station, taking the line down and under the District line to a new Aldgate South station on the site mentioned above. A new four platform station would be built, with two Metropolitan line platforms beneath two District line platforms.

The Circle line would cease to run from Tower Hill to Liverpool Street, and the Hammersmith & City line would cease to run from Liverpool Street to Aldgate East. (This greatly simplifies one of the most complex metro junctions in London.)

From the new Aldgate South station, the potential would then exist to extend the line south. My preferred route is to City Hall (London Bridge), Bermondsey, Surrey Quays before surfacing and taking over the existing line through Deptford, Greenwich, Woolwich and Abbey Wood.

Bermondsey would be built as a cross-platform interchange with the Jubilee line, thus passengers from the Greenwich area wanting the West End would have an easy change.

This proposal is intended to be completed in association with a Crossrail 1 extension to Dartford. Rather than needing to build two additional tracks, the Crossrail 1 trains would use the existing tracks to Dartford. Passengers using the current Dartford to Greenwich through service would instead use the high frequency Crossrail 1 service to Abbey Wood and change to the high frequency Metropolitan line service to Greenwich.

It must be emphasised however that this proposal depends on securing and safeguarding the development site south of Aldgate.

Additional Crossrail-style schemes

The primary mechanism to provide the necessary capacity is likely to be Crossrail-style schemes. To meet the growth curve, London needs to be targeting a major opening every 8 to 10 years, something that is considerably more aggressive than achieved to date.

Looking at the areas of London that could be served and could accommodate growth, there is probably a role for at least two more Crossrail schemes. Due to history, there are many more suburban lines south of the river. As such, logic dictates that at least one future Crossrail line will need to run from south of the river to Central London and back to south of the river. The main corridors left to be served would be:

- west towards Putney, Richmond, Roehampton, Hounslow
- south, towards Streatham, Sutton, Crystal Palace, Croydon
- south-east, towards Lewisham, Dartford, Orpington
- east, along the Thames

The most logical grouping would thus be west to south-east and south to east. (Note that areas in the North of London are already well served by the tube, with areas in the north-east served by Crossrails

1 and 2, and areas in the west served by Crossrail 1. The main target for a Crossrail scheme in north London would probably be the Metropolitan line, which might be added to the list of possible corridors.)

Crossrail 1 included some provision for Crossrail 2 in the design of Tottenham Court Road. Without the wider vision for London beyond 2030, it is likely that opportunities will be missed and mistakes made in developing Crossrail 2.

For example, looking at the outline of schemes above, it should be clear that at least one additional Crossrail will run via Clapham Junction (either the west or south corridors). Given this, it is absolutely vital that Crossrail 2 is built with at least passive provision for a four platform station with cross platform interchange at Clapham Junction.

Furthermore, it should be clear that at least one new line will need to run along the Charing Cross - Blackfriars - Cannon Street corridor, and as such this alignment should be safeguarded.

Eastern long-distance express line

At some point soon, the Brighton Main Line will be full. The Great Eastern Main Line will also be full. One possibility is to link them in a true large-scale project.

One possible routing would run from Gatwick to Canary Wharf via Bromley and Lewisham. Such an approach would be a game changer for Bromley, with journey times to Canary Wharf of less than 10 minutes.

From Canary Wharf, the line would continue on in tunnel to Stratford before surfacing and running next to the M11 to Epping. At Epping the line would divide, with one branch running to Chelmsford and the other to north of Harlow. Journey times from Epping and Harlow would also be transformed.

This is of course a very expensive scheme. Despite relatively few stations, it has major tunnelling and surface construction costs. It would likely link into expansion at Gatwick or Stansted airports, or major housing zones (such as at Oxted, Biggin Hill, or North Weald). That said, it would certainly meet the criteria of widening the number of people able to access Central London jobs.

Question 3

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3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

First, lets consider Crossrail 2 in South West London. Currently South West Trains operates three distinct service groups - Long-distance (to Exeter, Southampton, Portsmouth, etc), Outer suburban (to Guildford, Woking, Dorking etc) and Inner suburban (to Shepperton, Kingston, Hampton Court, Chessington and Epsom). Unfortunately, the SWML only has 4 tracks, 2 fast and 2 slow, with the Outer Suburban services shared between the fast and slow. In essence, Crossrail 2 exists to provide an additional 2 tracks making 6 in total, allowing each of the three service groups to operate independently. Unfortunately, there are still two key conflicts which limit the benefits of the scheme.

The Raynes Park conflict

The first conflict is at Raynes Park, where the 20tph Crossrail 2 service interacts with the services to Dorking and Effingham Junction.

This conflict will require Raynes Park station to be completely rebuilt with complex and expensive flyover junctions. The Dorking and Effingham services also have to fight for space on the 2 track section from Epsom to Raynes Park, restricting the frequency of Crossrail 2 service to Epsom and Chessington, and slowing down the Outer Suburban services. The conflict between the two service groups will also hurt reliability.

My proposal to tackle this is the 'Mole Valley Link'. It proposes a new railway line from Leatherhead to Claygate. This route runs through open countryside and would require minimal tunnelling. It also runs near potential housing development sites at Malden Rushett, south of Chessington, where there is potential for a new station.

All services from Dorking would run via the 'Mole Valley Link', stopping at Leatherhead, Claygate and Surbiton, instead of Epsom.

While this is a longer route, the higher speeds and lower conflicts would provide a suitable journey time. The proposal works well because it gets the Dorking services onto the Outer Suburban tracks at Surbiton rather than at Raynes Park. This greatly simplifies the work needed at Raynes Park. (With the 'Mole Valley Link', only Crossrail 2 services meet at the Raynes Park junction.) It is possible that the cost savings at Raynes Park may be sufficient to pay the cost of the 'Mole Valley Link'.

To complete the picture, Crossrail 2 services would run to Leatherhead via Epsom. Services from Effingham Junction would run via Sutton. The 'Mole Valley Link' would also allow Dorking services to be extended to start from Horsham. This would provide a small amount of relief to the line through East Croydon, widening the benefits of Crossrail 2 even further.

The Earlsfield conflict

The second conflict is the need for Outer Suburban services to serve Earlsfield. The station at Earlsfield is in zone 3 and currently served by Inner suburban services. TfL's current plans take Crossrail

2 via Balham. As such, Earlsfield would not be served by Crossrail 2.

Despite being an Inner Suburban location, at least some Outer Suburban services will be required to stop there. This is a clear conflict.

Passengers from Dorking, Walton, Weybridge and Effingham do not want to have their services stop at Earlsfield but will be forced to simply because the operators will have no other choice. The Earlsfield stop constrains the ability to maximise the Outer Suburban service, with 18tph being the maximum likely rather than the theoretical maximum of 24tph. Despite this, Earlsfield is still likely to see a cut of over 33% in services stopping, something TfL appears to want to avoid talking about.

My proposal to tackle this is the 'Swirl-Max' plan. It proposes to take the main line of Crossrail 2 via Earlsfield between Wimbledon and Clapham Junction. 20tph would run via Earlsfield, with the remaining 10tph taking a branch from Clapham Junction to Balham and on to Streatham. From Streatham, the branch would surface and completely take over the existing line through Haydons Road to Wimbledon, where the branch would terminate.

The 'Swirl-Max' proposal vastly increases the areas that benefit from Crossrail 2. Streatham is a fast growing area already, with the existing station seeing growth of 10% year on year, compared to 3% to 4% at most stations on the SWML. In addition, Streatham still offers considerable development potential, far more than many other Crossrail 2 stations along the SWML.

The 'Swirl-Max' route would provide 10tph to the Wandle Valley Opportunity area at Haydons Road station, which currently receives just 2tph. There is also the ability to create a new station at the A24 serving St.Georges hospital and driving developments in Colliers Wood and south Tooting.

Beyond these locations directly served by 'Swirl-Max', there is potential to link to development sites to the south at Mitcham and Hackbridge. Although the 'Swirl-Max' proposal does not propose taking Crossrail 2 to those areas, it does propose that the existing Thameslink service via Haydons Road is diverted to run via Mitcham Eastfields and Hackbridge stations (and on to Sutton, St.Helier and Wimbledon). This would double the service frequency to 4tph through these areas, driving development benefits linked to Crossrail 2.

Finally, it should be noted that 'Swirl-Max' provides a way to serve both Balham and Tooting, rather than one or the other. With four stations near the Northern Line, the relief gained is likely to be better than TfL's own scheme. (TfL's scheme is flawed in that it allows passengers from Raynes Park and beyond the ability to change onto the Northern Line. Since the journey to London Bridge and Bank will be quickest via the Northern Line, the likelihood is that TfL's plan will make the Northern Line worse, not better.)

Thus, while 'Swirl-Max' may be slightly more expensive than the TfL scheme, the benefits that accrue are significantly greater.

Chelsea

Crossrail 2 proposes a station at Chelsea which has proven unpopular with residents. Removing the station would save costs and speed up journey times for South West London. Alternatively, re-routing the line via Battersea Power Station would link to the Vauxhall Nine Elms area that is likely to need additional transport provision over and above the Northern Line extension.

Crossrail 2 in Central London

Crossrail 1 provides four double-ended stations in the heart of zone 1

- Bond Street, Tottenham Court Road, Farringdon and Liverpool Street, plus Canary Wharf. By contrast, Crossrail 2 provides just one double-ended station at Tottenham Court Road.

The provision of a single "destination" station will focus demand on the line. A major concern must be that dwell times there (the time it takes to get everyone on and off the train) will exceed the time available to run a 30tph service. The provision of a second central London station should be a requirement of progressing Crossrail 2.

The best option for such a station is under Jermyn Street, with one end linked to Green Park station. This has the advantage of linking to the Jubilee line, broadening the benefits of Crossrail 2 via interchange. It also further relieves the Victoria line, avoiding the tendency for passengers to clog up the tube with "last mile" journeys to the Green Park area.

Passive provision

As noted in the answer to question 2, the lack of a strategic vision for new lines beyond Crossrail 2 will cause decisions to be taken that may prove to be unwise. Specifically, there is a high likelihood of a future Crossrail line (Crossrail 3 or 4) being routed via Clapham Junction. As such, passive provision for a four platform cross-platform interchange at Clapham Junction is vital.

As it happens, the two branches of the 'Swirl-Max' proposal could be the basis of this Crossrail 3 or 4. One branch would be allocated to Crossrail 2 and the other to the new Crossrail line.

The passive provision point is important. Crossrail 1 has built two tunnels in the east, one to Stratford and one to Canary Wharf.

Unfortunately, this means that both tunnels will be relatively under-used assets, with the services split between the two at a location too close to Central London. However, on more than one occasion I have been told that it will be hard to split Crossrail 1 because there was no passive provision for it. (Apparently, the engineering to build a new sub-surface junction on Crossrail 1 is hard.)

Being more aggressive

Given the demand curve, one option is to be more aggressive with Crossrail 2. It seems clear that there is enough demand for two Crossrail lines to open in 2030, not one, but there is limited scheme management capacity in TfL and bill time in Parliament. One way to catch up the demand curve is to build four tracks through Central London from Victoria to Euston on the Crossrail 2 alignment. This is simple to achieve in engineering terms, as the tunnel boring machine planned to run from Wimbledon to Victoria would simply be extended to Euston. Using the same alignment also avoids extra scheme management time or Parliamentary bill time. To manage immediate costs, trains from

the South West would terminate at Euston, while trains from the North would terminate at Victoria, acting as two independent services.

With this duplicate core section, it would then be easy to extend on from Euston and on from Victoria as a follow on scheme. In the north, enough capacity would be available to send a branch to Stratford and the Lower Thames area. In the south, enough capacity would be available to properly relieve the Northern line and serve areas further south.

The key is the realisation that the most expensive stations on Crossrail 2 are the Central London ones, and as such it may make sense to build them once with four platforms, rather than building them with two platforms and having to return later to expand them. While it sounds expensive, the likelihood is that the additional cost would be of the order of £2bn (£500m for extra tunnelling and £500m extra for each expanded station). This makes the concept a very cheap way to lay the foundations for future extensions.

Costs

There appear to be limited ways to reduce the cost of building Crossrail 2 as currently planned. The station at Wimbledon must be a major target for cost reduction, with 'Swirl-Max' proposing a fast line tunnel to avoid expensive demolition and construction work.

There is one more radical possibility however. If the 'Mole Valley Link' and 'Swirl-Max' were both adopted, then Crossrail 2 could be completely separately from Network Rail (by dropping the Hampton Court branch and Waterloo services to Kingston). Such a separation would allow a change in the technology used for Crossrail 2.

The alternative technology would be the "DLR-style" automated metro that was identified in the 2013 Regional vs Metro consultation. A DLR-style automated metro technology could allow 40tph of shorter trains to provide the same capacity, requiring lower cost shorter platforms. An automated metro is likely to also have lower operating costs.

Question 4

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4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

Funding is not my specialist area. However, I believe that all taxpayers in London should pay a transport investment levy to help fund large-schemes. In addition, development sites near locations that receive transport upgrades should continue to pay a levy.

To broaden the tax base to those that live outside Greater London, two additional areas should be considered. Firstly, those living inside the M25. Secondly those living in districts clearly linked to the London commuting economy. The latter category is subjective, but it would be wise to provide an objective way to classify boroughs near London, such as by the percentage of workers that commute to locations inside the M25.

Question 5

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5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London

Barcelona's new metro line 9 offers a novel construction technique which does not appear to have been examined in London yet. Rather than constructing twin tunnels, each large enough for a single track, Barcelona line 9 uses a single large Tunnel Boring Machine to create a tunnel large enough for 4 tracks (2 on the top deck and 2 on the lower deck). Rather than using the extra space for tracks, the project chooses to use the space to construct the stations within the tunnel, dramatically reducing the cost of building each station. Since stations are the most expensive part of an underground railway, this technique should definitely be evaluated for London.

Summary

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While Crossrail 2 should be supported, it is not without flaws. The 'Mole Valley Link' and 'Swirl-Max' proposals tackle the key issues south of Clapham Junction, while an additional station at Green Park would tackle the flaws inside zone 1. Taken together, these three proposals would greatly increase the benefits linked to Crossrail 2, and the potential for development.

A more aggressive approach would be to build four tracks between Euston and Victoria, with the northern and southern halves of Crossrail 2 overlapping. This has a low additional cost, perhaps around £2bn, but lays the foundation for future extensions that do not have the complication of development in Central London.

Beyond Crossrail 2, extending the Metropolitan line to South East London is worthy of further study, simply because it would be relatively cheap.

Finally, London lacks a wider vision for large projects. This needs to be rectified urgently, as without it decisions on Crossrail 2 may not take into account the wider future context.

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Innovate UK

The Innovate UK response to the National Infrastructure Committee's call for evidence on London's Transport Infrastructure.

1. Innovate UK is the UK's innovation agency, a non-departmental public body sponsored by BIS. It is the prime channel through which the Government incentivises innovation in business. Innovate UK is business-led. Our governing board and executive team is comprised of experienced business innovators and experts. We work with people, companies and partner organisations to find and drive the science and technology innovations that will increase productivity and exports and grow the UK economy.
2. We are working to:
 - Accelerate UK economic growth by nurturing small high-growth potential firms in key market sectors, helping them to become high-growth mid-sized companies with strong productivity and export success;
 - Build on innovation excellence throughout the UK, investing locally in areas of strength;
 - Developing Catapults within the national innovation system, to provide access to cutting edge technologies, encourage inward investment and enable technical advances in existing businesses.
 - Working with the research community and across government to turn scientific excellence into economic impact, and deliver results through innovation.
 - Evolve our funding models to explore ways to help public funding go further and work harder, while continuing to deliver impact from innovation.
3. In line with our strategy¹ we operate across Government and advise on policies which relate to technology, innovation and knowledge transfer. We also support Government departments to become more efficient by supporting them in developing innovative solutions through harnessing the creativity that businesses can offer.
4. Innovate UK was established in July 2007 (as the Technology Strategy Board). We have committed more than £1.5 billion to date and independent evaluations have established that overall Innovate UK has created over £6 of GVA for every £1 it has invested and 7 jobs for every business it has invested in. Over the last 8 years this has added up to delivering a total of £7.5Bn and 35,000 jobs. The private sector more than matches that investment, doubling the power of public sector money, and we have directly supported over 6,500 companies. We work with nearly every University in the UK to stimulate the commercialisation of leading-edge academic research and innovation.
5. Transport Systems as well as vehicle technology across Automotive, Aerospace, Marine and Rail have had a major focus within Innovate UK over the last eight years. We have placed significant investment in collaborative R&D partnerships, driving growth within businesses and supply

¹ 'Concept to Commercialisation: A strategy for business innovation, 2011-2015'.
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/360620/Concept_to_Commercialisation_-_A_Strategy_for_Business_Innovation_2011-2015.pdf

chains, both nationally and for exports. These areas continue to be prime focal points as we build on success in these sectors of national importance by delivering the Advanced Propulsion Centre and Aerospace Technology Institute programmes on behalf of the Department of Business, Innovation and Skills.

6. The Transport sector has grown into one of Innovate UK's key priorities. Our aim is to help innovative UK businesses to take advantage of the opportunities that a rapidly changing transport system will present, both in the UK and in overseas markets. Over the last parliament we have invested up to £70m per year of our core budget in support of hundreds of innovative businesses developing new products across the transport sector, from new powertrain technologies for low emissions buses, through to low noise aircraft systems and intelligent mobility services. Our focus from 2007-2015 grew from the Low Carbon Vehicle Innovation Platform to cover Aerospace, Rail, Marine and Transport Systems.
7. Innovate UK supports businesses in two main ways. Firstly, we provide funding to allow development of high potential, ground-breaking new technologies and products that are too early and too risky for the private sector to fund alone. Secondly we help businesses connect to the right partners, expertise, test facilities, financiers and influencers that can accelerate their route to market. A key component of innovation is knowledge exchange through networks. To drive this at a national level Innovate UK has invested £1.5bn in establishing world leading Catapult centres, which are designed to transform capability for innovation in specific areas of specialism to enable future economic growth. These centres launched by Innovate UK, provide critical expertise and test facilities to businesses in developing new products. Within near reach of London with a focus on transport challenges we have Transport Systems and Satellite Applications, and inside the capital we have the Future Cities and Digital Catapults. Additionally, the national network of High Value Manufacturing Catapults are extremely important for grounding the manufacturing of new transport technologies in the UK.
8. The demand for transport and its infrastructure is proving to be a critical challenge for the UK in enabling businesses to function and to support economic growth through the movement of people and goods. Notwithstanding social development, wellbeing and environmental impacts, we see great potential in balancing demand and optimising connectivity through evaluation of new innovations and technologies and how these trends can offer greater utilisation of the national transport infrastructure. Equally advancements in new innovation for asset management and connectivity can provide cost savings in operational maintenance for local authorities.
9. We have shown how major demonstrations of new innovations and technologies, such as electric vehicles, can attract international investment into the UK and accelerate market adoption of low emission technologies and reduced risk for industry to bring new products to market. New business models provide value across the range of transport issues and we have also seen valuable insights into the complexities of the network users and how disruptive and innovative thinking can drive a change in behaviour towards transport.
10. Expertise and sector knowledge at Innovate UK can bring significant change in the transport market. Through working closely with industry and evaluating past projects Innovate UK provide timely and value added interventions to drive supply chain growth and productivity. We demonstrate how the collaboration across industries can open new value to capture and meet the future challenges of transport.

11. The value of working closely with UK Governments on specific societal challenges can bring about timely change in regulation and standards to match the pace of technology and innovation and how these drive new customer demands. Projects funded through Innovate UK show how risk reduction through targeted innovation investment can overcome perceived challenges and drive collaboration across industries on a common challenge. Innovate UK welcomes the National Infrastructure Committee's inquiry into London's Transport Infrastructure. Set out below is our response to the questions raised by the Committee.

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

12. London's ability to move people and goods over the next two to three decades to support economic growth and social wellbeing will be challenged by the limited transport network capacity through its geographic constraints and how it has evolved in construction terms as a city over the years. Increasing population through migration, aging and urban growth, places significant challenges onto London and its existing transport infrastructure.

13. Drivers spent more than 250 hours idling in London traffic in 2013, which is double the UK average – and this is set to increase to 299 hours in 2030, equivalent to 40 working days a year. Although less than a third of Londoners commute to work by car, the cost of living and the value of time for the capital's 1.4 million car commuters is at such a premium that in 2030, it is estimated London will incur £9.3 billion from traffic congestion, an increase of 71 percent from today, costing each car commuting household more than £4,000 a year by 2030.

14. The commuter today is already witness to train overcrowding and congested roads and the frustrations and stresses in the daily commute. Today's rail commuters already consistently exceed available capacity in and out of London during the morning and evening peaks (demand is 104% of capacity) and these trends look set to continue. Demand exceeds capacity at mainline stations including Paddington at 110%, Moorgate 108%, Blackfriars 108% and St Pancras 107%.

15. Improving public transport reliability, predictability and accessibility will be challenging for the transport system of the future due to increasing demand from a diverse demographic as well as vehicle and connecting infrastructure security. Other social challenges include safety for pedestrians and cyclists. Additionally the commuter, traveller and tourist face air quality concerns.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

16. There are a number of options which include:

- enhancements in signalling (through ERTMS or ETCS) on the existing mainline network, which has the potential to significantly increase capacity by enabling closer running of rail services;
- further roll out of future rail technologies - such as autonomous tube rolling stock (as in use on the DLR);
- electrification of non-electrified London stations will contribute to an accelerated rail timetable and in addition to investing in large-scale transport infrastructure, a range of incremental gains may also be realised by strategic delivery of a range of lower-cost options to enable faster passenger loading, dwell times at stations, optimised train driving aids and smart technology to support passengers in making informed travel choices;

- the strategic consideration towards the reduced use of the private car in central areas and incentives towards zero emission vehicles. Better use of park-and-ride out on the peripherals of the city such as the M25, with driven or driverless/autonomous vehicles serving individual's needs in accessing the city;
 - to benchmark international initiatives such as Frankfurt, Amsterdam, and other large EU cities that have tackled these issues, e.g. wide use of street-level trams, simple ticketing, transparent and cost effective pricing, radial as well as axial routes to encourage businesses to site themselves out of the city centre;
 - a strategic and tactical view to consider new business models in how operation of local transport such as taxis and buses can enable a more on demand service rather than traditional methods of delivering a public transport services;
 - a push for greater optimisation of the River Thames as a means of moving people and goods efficiently, providing greater physical connectivity with additional bridging. Providing better commuter and traveller information through enhanced and accurate information through wireless connectivity;
 - infrastructure investment should also consider the optimisation of transport within London as a system. Using innovations in infrastructure intelligence to drive greater intermodal connectivity and ways of balancing the transportation network;
 - to build upon the demonstrated benefits of smart infrastructure by the Cambridge Centre for Smart Infrastructure² to realise those benefits across the whole lifecycle of future infrastructure projects, from design and construction through to operation; and,
 - to support shifts in propulsion systems, alternatively fuelled vehicles need infrastructure including rapid electric charging points and hydrogen refuelling.
- **How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?**
17. Priority should take into account the ability to smooth transportation flows and optimise capacity. Connectivity to jobs and businesses drives economic growth, reducing journey times and congestion enables greater mobility of both people and goods. This could be achieved through an in-depth study, ideally with the support of specialist agencies including the DfT, TfL, modelling tools. This could be done through the Transport Systems and Future Cities Catapult and other specialist agencies as appropriate.
- **What might their potential impact be on employment, productivity and housing supply in London and the southeast?**
18. We would recommend a study ideally with the support of specialist agencies including the DfT and Transport for London to assess trends in innovation and technology and matching that with population, migration and business growth forecasts. This would assess the impact of large-scale transport infrastructure improvements in London on employment, productivity and the supply of housing.

² The Cambridge Centre for Smart Infrastructure is an Innovation and Knowledge Centre, jointly funded by Innovate UK and EPSRC to bring research into smart infrastructure into practice through a series of technology demonstrations with industrial partners. Led by Professor Lord Mair, CSIC has been involved in both Crossrail and the London Bridge upgrade project to demonstrate the benefits of smart infrastructure and are in discussions with all the major infrastructure projects to continue this work. See <http://www-smartinfrasturcture.eng.cam.ac.uk/who-we-are>

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

19. There are opportunities for Crossrail 2 to be explored through modern digital engineering practices, such as smart infrastructure and maintenance. Condition monitoring systems and intelligent sensors would help to reduce operational costs. The digital revolution is enabling greater mobility of people through smart ticketing, ticketless barriers and greater system connectivity. Learning from industrialised sectors such as Aerospace and Automotive in the design and development of long term programmes and process innovations should be explored by the construction sector and therefore encouraged by the public sector procurement. Specification freeze, engineering change control and complete design for manufacture ownership are lessons that can be learnt.
20. It is expected that the proposed Crossrail 2 project will be fully BIM level 2 migrating to level 3 compliant (a project heavily supported by Innovate UK), and will be able to benefit from the legacy of Crossrail 1 and other mega infrastructure programmes such as Thames Tideway and HS2 phase 1.
21. Further benefits could be realised through the use of novel building methods such as offsite manufacture in the construction phase. Equally instilling a culture for innovation within the programme and driving innovative practices into the development frameworks from the funder should challenge traditional design and engineering practices, standards and regulations and drive new methods for assessing risk through a balanced portfolio. To drive innovation into the supply chains through accelerated procurement specification and requirement capture to deliver a more cost effective railway, rolling stock, system and construction.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

22. This is for others more expert in the delivery of large-scale transport infrastructure to comment.
 - **What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?**
23. This is for others to comment.
 - **What innovative funding mechanisms could be considered to support delivery of key schemes?**
24. A funding scheme that considers and drives cross sector innovation. To include transport modes, digital, construction, local regions and attracts emerging non transport industries to provide innovative systematic products and services in the design and operation of the transport system.

These could include Innovate UK's SBRI³ and CR&D⁴ mechanisms and the national Catapult centres⁵, supported by a London Innovation Fund.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

25. The challenges facing London are very similar to other cities globally, as population growth and the demand for transport, travel and social wellbeing drives expectations of the transport network. In many cases demand is outstripping supply. These lessons are being learnt by London. Global benchmarking and collaborations would provide accelerated learning and reduced trial costs.

Evidence submitted on behalf of the Innovate UK by:

Dr Ruth McKernan, CBE
Chief Executive, Innovate UK

Signed:

[signature redacted]

Date: 12.01.16

Contact:

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³ The Small Business Research Initiative (SBRI) is a programme that addresses public sector needs with solutions from businesses via pre-commercial procurement contracts. More information: <https://sbri.innovateuk.org/>

⁴ Collaborative research and development (R&D) co-funding projects involving partnerships between businesses and between business and academia, it reduces financial and technical risk and encourages knowledge exchange, supply chain development and parallel working on complex challenges. See <https://interact.innovateuk.org/-/collaborative-r-d>

⁵ The Catapult centres are a network of world-leading centres designed to transform the UK's capability for innovation in specific areas and help drive future economic growth. See <https://www.catapult.org.uk/>



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Submitted electronically

8 January 2016

ICE written submission to the National Infrastructure Commission call for evidence – London’s Transport Infrastructure

Dear Lord Adonis,

Please find the Institution of Civil Engineers’ submission to the National Infrastructure Commission call for evidence on connecting northern cities. This submission is an output from ICE London region.

The ICE is a UK-based international organisation with over 86,000 members ranging from professional civil engineers to students. It is an educational and qualifying body and has charitable status under UK law. Founded in 1818, the ICE has become recognised worldwide for its excellence as a centre of learning, as a qualifying body and as a public voice for the profession.

In London, ICE supports and represents over 9,000 members living and working in the capital to actively promote civil engineering with industry, schools, universities, local government and the media. Further details from www.ice.org.uk/london

We welcome the opportunity to respond to the National Infrastructure Commission on the pressing issue of London’s transport requirements over the next 20 to 30 years. We have kept our response brief and focused on key points. Our members have much to offer in terms of expertise and would welcome the opportunity to further assist the Commission in its work.

Yours sincerely,

Suzanne Moroney
Director, ICE London and South East England

National Infrastructure Commission Call for Evidence - London's Transport Infrastructure: ICE London Response

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

The major challenges facing London and the wider South East are undoubtedly the anticipated population growth, the related problems of capacity constraints across all types of infrastructure and a long term problem of building too few homes to accommodate the growth in households.

The [London Infrastructure Plan 2050](#) (LIP 2050) sets out a projected population growth of over 40% by 2050, bringing London's population to over 11 million.

Much of London's infrastructure is already at or close to capacity. Commuter lines into London and the tube network frequently experience overcrowding. Significant parts of the Capital's main highway network are already stretched to and beyond their practical capacity with the result that whole areas can frequently become gridlocked. London and the South East are likely to need a new water resource within the next 25 years. Increased pressures on electricity mean that we need to an improved approach to demand management.

Housing regularly tops Londoners lists of concerns, based on exceptionally high selling and rental prices, as well as over-occupation. An estimated 49,000 homes¹ are required per year to 2050, significantly more than has been built in London in previous years.

A lack of affordable housing and increasing pressures on infrastructure have obvious impacts on Londoner's quality of life. Whilst London still remains an attractive place for young professionals, high house prices could soon see young skilled workers moving out of the city to areas where they can buy or afford to rent a property. If this happens on a large scale, the likely impact is a significant increase in the numbers commuting into London, putting ever greater pressure on the rail network. Others may be put off commuting into London by journey times and/or high fares. Transport operational staff, in particular need to live close to their workplaces.

ICE London believes London's future economic growth will be constrained unless there is sustained investment in the city's infrastructure and housing.

¹ [London Infrastructure Plan 2050](#), page 14.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

There are parts of London with significant space for house building that are currently not being built on. In many cases the reason is simple; these areas do not have effective transport connections. Barking Riverside is a prime example, where brownfield land has the potential for over 10,000 new homes to be built. In the absence of the proposed extension of the London Overground to Barking Riverside, no more than 1,500 new homes are permitted. Such development will bring jobs and economic growth to the area. ***The provision of additional housing and related employment should be planned in tandem with upgraded and new transport provision, and this must be placed at the top of any prioritisation assessment.***

A strategic long term approach is required that maps out London's key transport requirements. A project by project approach will not provide London with the best outcome; it is the combined impact of transport, housing and infrastructure investments that will realise the highest benefits for London.

A decision on airport capacity is urgently needed if London's transport needs, and house building, are to be planned effectively.

The LIP 2050 sets out a strong plan for London's transport investment to 2050, albeit with the need for further prioritisation and an update when the Government makes its decision on airport capacity. The need for future reviews and updates, should not delay implementation of the projects identified as necessary in the nearer term.

Better transport links to the wider South East must also be a high priority. The proposed Crossrail extension to Ebbsfleet and giving Transport for London control of more South East rail routes are crucial in providing better connectivity into London.

Transport for London has identified a wide range of interventions which have positive business cases. We do not propose to rank individual projects here but see a pressing need for two projects in particular, namely Crossrail 2 and the Silvertown Tunnel.

Given its forecast beneficial impacts on transport relief and economic development, Crossrail 2 must be a priority and ICE London is pleased to see a growing consensus from local, regional and national government on the need for the scheme. Many of the benefits of Crossrail have already been seen in terms of unlocking housing growth and ICE London believes that similar gains will be accrued from Crossrail 2.

Similarly, the Silvertown Tunnel is a much needed scheme to alleviate congestion on the Blackwall Tunnel. East London urgently needs a series of river crossings; Silvertown Tunnel should be considered as the first of a number of new multi-modal river crossings to the



east of Tower Bridge. This will open up opportunities for housing and employment growth at the London Riverside, Royal Docks and other Opportunity Areas on both sides of the river. Such schemes have long been regarded by existing employers and potential inward investors as being absolutely top priority.

There are several other schemes with strong business cases, that ICE London believe to be necessary to support London's growth. These include the Barking Riverside Overground extension; DLR extensions; the Croydon Tramlink extension; London Underground major station capacity enhancement schemes.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

The Government has the ability to significantly reduce the costs of infrastructure build in London by clearly committing to a long term programme of work. This programme should not be changed at political whim, but revisited periodically and adjusted to reflect changes in the way the city functions or technological advances.

A clear programme of work, that sets out the timeline for major project delivery and commits to funding, will allow the construction industry to reduce costs:

- A long term plan will enable effective sequencing of projects, to either remove clashes for particular skilled workers or allow synergies to evolve e.g. where joint training academies are established.
- Certainty will enable greater investment, which will require a lower rate of return due to the lower risks of the project being stalled or abandoned.
- Planning for their workforce now – this will ensure there are adequate numbers of skilled workers, and avoid the need to pay excessive wages to those with skills in short supply. It will also reduce delays.
- Planning their supply chain now – this will reduce delays and the cost of sourcing materials and component parts. This will have the added benefit of allowing firms around the UK to gear up to supplying projects such as Crossrail 2, avoiding the need to source materials from abroad.

The London Infrastructure Plan 2050 and the Mayor’s Transport Strategy need to be articulated into a programme of work that sets out and sequences the key infrastructure projects and development sites over the next 20 years.

ICE London believes this is the single most effective way to reduce costs. A decision is urgently needed on airport capacity to enable a realistic programme of work to set out.

On Crossrail 2, there are likely to be further efficiency savings that are possible. For example, by exploiting the potential benefits of BIM and adopting best practice contracting and procurement. On major projects additional money is often spent at interfaces with other infrastructure owners and utility companies. This is where the risks are. Early engagement and buy in from all parties is crucial to successful, lower risk and lower cost, delivery.

Further innovations may come forward that reduce costs. This is tax payers and fare payer’s money being spent, so every effort needs to be made to make sure it is being spent wisely.

Crossrail has developed much in the way of best practice particularly on skills development and innovation, these need to be captured and built on for Crossrail 2 and other major projects. There will be other areas, that with the benefit of hindsight, can be improved on.

ICE London recommends that infrastructure providers, innovators and academics are brought together and set the challenge to reduce the build cost of Crossrail 2. This should



include a session on lessons learned from Crossrail. ICE London would be happy to convene such a group and report to the Commission on options to reduce costs. Many of the innovations that come forward would likely be applicable to wider infrastructure build.

The benefits of Crossrail 2 will be maximised when it is planned alongside London's wider infrastructure needs. This will ensure the possibilities for integration are taken full advantage of.

For example, designing in energy cooling from the ground around the tunnels to either help cool the tunnels themselves or supply heating and cooling to local building networks around shafts and stations. This was considered too late for implementation on Crossrail, but has been proven to be effective in other European countries.

One of the main benefits of Crossrail 2 is the potential to unlock significant housing growth along its route. ***The potential for the creation of new vibrant communities will be maximised if there is a clear and early commitment to fund and deliver Crossrail 2 to stated timescales.*** Experience from London's Docklands demonstrated that an early physical and hence visible start at least to preparatory works generates early simultaneous inward investment. This will give developers the confidence to start building homes and invest in the public realm aspects of the development that will ensure high quality places to live are created.

As well as branches via the Lee Valley and to New Southgate a further extension serving major potential housing development and Opportunity Areas in east London which would potentially offer additional development related funding towards Crossrail 2 should be considered. A spur has been safeguarded to facilitate a possible extension to east London and the ICE suggests that this is considered by TfL, as well as how Crossrail 2 can improve access to Stansted. An extension from Epsom to Gatwick should also be considered.

Jobs are the other main benefit for London overall and areas along the route, again a clear commitment to Crossrail 2, will allow training schemes to be put in place to ensure local people benefit from the job opportunities created.

The benefits of Crossrail 2 will spread far wider than London, and this must be factored into any consideration of the benefits.

The rail line will serve regional areas outside Greater London and will connect to National Rail networks in Hertfordshire and Surrey, better linking those to the London Underground and national and international services. Crossrail 2, like Crossrail, is forecast to generate jobs around the UK – 60,000 while it is being built and 200,000 once the project is operational².

Crossrail 2 will maximise the effect of other transport investments, particularly those such as High Speed 2, that better connect other parts of the country to the capital; by relieving congestion at key points where National Rail lines meet the London Underground. It would

² TfL analysis



be less than optimal to improve journey times into London, only for passengers to be held up accessing an overcrowded tube network. High Speed 2 arriving into Euston station is the obvious example.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

Crossrail 2, along with many of London's other transport requirements have a positive business case and will generate significant additional value for London and the UK as a whole. In the long run, investment will pay for itself through higher productivity, greater revenues to business, increased land and property values, and increased tax receipts for government. The issue is how these gains are captured and used to fund infrastructure investment.

ICE London supports the GLA's pursuit of fiscal devolution. Devolution of the form set out by the [London Finance Commission](#), whereby London retains income from property tax to make self-determined investments in its infrastructure, would provide a source of revenue in itself and provide greater scope to borrow to fund infrastructure. A funding gap will still remain, and alternative funding mechanisms will be required.

Transport investment in particular can have a significant impact on property prices. Crossrail is demonstrating this well, even before it has opened – Whitechapel residents are expected to see a 54% increase in property values, with the average increase along the line expected to be 9%³. As a minimum, the increase in stamp duty and business rates revenue this produces should be available to London, which the city can then borrow against to fund transport projects.

Learning from the Northern Line Extension and similar schemes, there are opportunities to take advantage of local uplifts in land values ***ICE London would like to see mechanisms put in place to allow the capture of increased property and land values for example through the opportunity and compulsory purchase of land parcels along key new transport routes and through additional property taxes in areas that have seen significant increases in property values due to transport investment.***

Crossrail was funded by equal contributions from Central Government, London Government and London business. London businesses were in support of this arrangement and are signalling similar levels of support for a comparable arrangement for Crossrail 2.

It is reasonable to argue that those who benefit should pay, its seem logical that the cost should be shared between National Government (who will gain from increased tax revenues), property developers (who will gain from higher returns), residents (who will see a rise in the value of their property), passengers (who will gain from improved connectivity, reduced journey times and so greater access to jobs and leisure opportunities) and London businesses (who will gain from improved connectivity for customers and employees).

³ [JLL analysis](#)

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

On financing, the Mayor of Chicago Rahm Emmanuel set up a Chicago Infrastructure Trust as a new method of generating private investment for infrastructure projects.

The Trust has funded an energy retrofit programme for 60 public buildings, costing \$12million and recently negotiated a \$32million 4G upgrade of the Chicago transit system. It has also been suggested that the Trust could fund a high speed rail link to O'Hare Airport.

The Trust does not work as a Private Finance Initiative (PFI). Instead, the Mayor would release bonds for the private sector to invest in, whilst ownership and management of the infrastructure would remain with the public sector.

In London, an Infrastructure Trust could be set up in the same way as the London Enterprise Panel, under sections 30 and 34 of the Greater London Authority Act 1999. Should a Trust be set up, it could provide a significant level of funding for projects like Crossrail 2.



Rt. Hon Joan Ryan MP
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Please find below my submission to the National Infrastructure Commission's call for evidence for the CrossRail 2 consultation.

I am responding in my capacity as MP for Enfield North, an area which could benefit substantially from significant infrastructure investment.

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

The greatest challenge for London and its commuter hinterland over the coming years will be how we can continue to connect people's homes with jobs. Cities are engines of growth, and London is particularly important in driving the UK economy. London's ability to do so relies upon being able to house and then transport a talented labour force to work. But with the population continuing to grow rapidly – by the equivalent two tube trains full of people every week – this is becoming an increasing challenge.

The housing crisis in London, including here in Enfield, has been well publicised. What is clear is that over the coming decades we will need to build significant numbers of new homes. These homes are essential if London is to continue attracting talented people that work in the high-growth sectors that power the economy. But to be viable, these homes must be built around public transport networks. In my constituency, road congestion is already severe in the morning and evening rush hours, partly because existing rail services are not as frequent or reliable as required. While there is potential for new housing development in my constituency, to take this forward without a big improvement in public transport would overwhelm the road network. If we fail to build more homes it will only make the existing challenges worse and damage London's long-term prospects.

Many of my constituents travel into central London to work: severe congestion on the transport network is a daily challenge for many, delaying journeys into work and deterring people from travelling to highly productive and well paid jobs in the centre of London. While planned improvements are welcome, over the next few decades London will need to invest in major new infrastructure projects to provide a major capacity boost. Without the transport network that can connect homes to jobs, London's international position is at risk.

This would harm my constituents. The London-Stansted-Cambridge corridor has had enormous success in attracting high-tech firms which provide skilled jobs. Proximity to a thriving London has been crucial to attracting that inward investment which is needed to drive up living standards in my constituency. In Enfield wages are significantly below the London average and unemployment is persistently higher. London must continue to thrive to create new opportunities for people there and across the whole city.



2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

My constituency needs public transport improvements in the short, medium and long term to support economic growth. In the short to medium term, Network Rail needs to commit to improving the West Anglia Main Line to provide more frequent and more reliable services.

Currently, services on the West Anglia Main Line (WAML) are severely hampered all the way along the line because the section between Coppermill Junction (just south of Tottenham Hale) and Broxbourne Junction in Hertfordshire – which passes through the Eastern side of Enfield North - consists of only two tracks. Fast and slow services compete for space and as a result, journey times are long for the longer-distance services and frequencies are relatively low for the shorter-distance stopping services. Reliability is also a key concern: if one track is out of action services can become delayed or cancelled.

Providing four tracks could provide the solution, and would also pave the way for Crossrail 2, which would allow up to 30 trains per hour in each direction through central London and connect into the region's existing transport network. Delivered by 2030, Crossrail 2 could unlock tens of thousands of new homes and jobs in the WAML corridor alone. The delivery of four-tracking by 2024 will ensure that this growth can be kick-started ahead of Crossrail 2 opening in 2030. This would provide a step change in accessibility in my area and unlock growth in the Upper Lea Valley, one of London's largest opportunity areas.

It is important that strategic options for future investment in large-scale transport infrastructure improvements focus on maximising the return on investment. This is best achieved by targeting areas with high growth potential, such as the opportunity areas in the Upper Lea Valley. These areas have the most opportunity to unlock economic growth which can pay back the original investment, securing a stable economy. While it is important to invest in cities around the UK, this cannot be at the expense of London. It not only needs investment, but can also provide the greatest return on that investment, growing the national economy. Growth is not a zero-sum game.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Delivering improvements to the West Anglia Main Line in Network Rail's control period 6 (2019-24), with an explicit commitment to Crossrail 2, would unlock significant housing and economic growth years ahead of the railway opening. As we have already seen with Crossrail, significant housing development happens in anticipation of the new railway, and the Upper Lea Valley provides very large opportunities to build some of the tens of thousands of new homes that we need. A commitment to improving the line and progressing Crossrail 2 would help increase the benefits, and deliver them earlier than would otherwise be possible.



Benefits could further be maximised if holistic development plans are drawn up along with transport plans. Enfield Council has developed ambitious plans for new homes, jobs and growth at Meridian Water as a result of local rail improvements. With further commitments to Crossrail 2, these plans could be further developed at other locations in the borough, to maximise opportunities and get the most efficient use of the infrastructure.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

Crossrail 2 has developed a funding package where the majority of funding is locally provided. This type of funding model, where Government's contribution is dramatically reduced maximises value and instead focuses planners on how best to design projects that can pay for themselves through greater economic growth, job creation, reduced unemployment and increased tax receipts.

Government needs to demonstrate leadership and commitment to Crossrail 2 by providing the development funding needed to get projects off the ground. That businesses are paying for Crossrail shows that, providing there is a clear Government commitment to infrastructure investment, new funding streams can be secured. This minimises central government expenditure while maintaining the transformational benefits of the infrastructure. With a possible funding structure in place, central Government should provide the £250m needed to develop Crossrail 2 and secure powers to build it in this parliament.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

In Hong Kong, city planners work as part of the railway company to devise development plans which provide a funding stream for the railway. These integrated plans make the most of available opportunities and help pay back the investment faster. Parts of the Upper Lea Valley contain large areas which could be regenerated and support new development should Crossrail 2 go ahead. Mechanisms which capture this value could be developed to provide additional funding streams for the project.

Thank you for the opportunity to respond to the call for evidence.

Regards,

A handwritten signature in blue ink, appearing to read 'Joan Ryan'.

Rt. Hon Joan Ryan MP

Kent County Council response to National Infrastructure Commission re London's Transport Infrastructure



January 2016

Introduction

The right infrastructure is key to growth; however getting the right infrastructure at the right time and getting funding for it is a challenge for many of the priority growth areas of the country.

National government clearly has a major role to play and it is in this context that Kent County Council (KCC) welcomes the National Infrastructure Commission (NIC) as a permanent statutory body. The County Council supports the NIC's preparation of a National Infrastructure Assessment (NIA) which will provide long term strategic vision and establish clear, spatial priorities for the delivery of infrastructure aligned to economic and population growth. The NIA will ensure greater certainty for private investors, and provide greater assurance to local authorities and the development industry that growth is deliverable in a sustainable manner, supported by existing and planned infrastructure.

In November 2015 KCC published the 'Kent and Medway Growth and Infrastructure Framework' (GIF)¹ which comprehensively identifies the significant levels of economic and housing growth planned in Kent and Medway (to 2031) alongside the critical infrastructure necessary to facilitate this level of growth. Infrastructure necessary to unlock growth has been estimated at £6bn of which £2bn is currently unfunded, which if left unaddressed will undermine the long term delivery of sustainable growth in Kent and Medway. The County Council and its partners are now actively preparing a 10 point action plan to take forward the GIF including consideration of the funding models and structures required to deliver identified infrastructure priorities.

KCC therefore welcomes the opportunity to respond to the NIC in respect of London's transport infrastructure. The provision of good, efficient and reliable transport infrastructure in the capital is essential to ensure the free movement of people, goods and services between London and its environs, including Kent. Our county also acts uniquely as the primary transport corridor between the capital and the principal Channel ports of Dover and Eurotunnel.

London's transport infrastructure is not all about infrastructure in London. It is – or should be – about the provision of transport infrastructure which serves the whole of the greater south-east region, supporting the wider growth of the Home Counties which provide a significant proportion of the capital's workforce who are dependent on excellent transport infrastructure to access their employment and so contribute to the gross domestic product of the whole area.

There are a number of key transport initiatives which will have a direct bearing on London's transport infrastructure and its ability to cater for an ever increasing demand from commuter, business and leisure markets. Each of these initiatives is considered in relation to the specific questions posed in the consultation.

¹ The GIF is available to download via www.kent.gov.uk/GIF

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

The major economic and social challenges facing London and the greater south-east region over the next two or three decades can only be properly understood in the context of that wider region. The challenges facing London cannot be addressed in London alone; they must embrace the region in which the capital is located and from which it draws its daily workforce. The challenges facing London and its Home Counties must therefore be treated together.

KCC has identified significant increases in employment growth and housing need projections in Kent and Medway between now and 2031. This growth should be recognised as a part of the major economic and social challenges facing the wider south-east region, and the NIC's plans for London's transport infrastructure must be cognisant of these significant economic and social challenges.

Projected Growth in Housing Need to 2031

The following figures for each District in Kent, and for Medway, indicate the forecast level of housing need between 2011 and 2031 (correct at November 2015):

District	Additional housing need 2011-31
Ashford	14,540
Canterbury	16,000
Dartford	17,300
Dover	14,000
Gravesham	6,170
Maidstone	18,560
Medway	24,000
Sevenoaks	12,400
Shepway	8,750
Swale	13,192
Thanet	12,000
Tonbridge and Malling	13,460
Tunbridge Wells	12,960

Projected Growth in Employment to 2031

The following figures for each District in Kent, and for Medway, indicate the forecast level of employment growth between 2011 and 2031 (correct at November 2015):

District	Additional employment growth 2011-31
Ashford	17,200
Canterbury	17,000
Dartford	22,100
Dover	400
Gravesham	7,000
Maidstone	14,400
Medway	20,100
Sevenoaks	7,000
Shepway	500
Swale	9,900
Thanet	5,000
Tonbridge and Malling	7,700
Tunbridge Wells	9,900

Southeastern Metro Rail Services

KCC has taken a very keen interest in recent years in the commuter routes which serve the south-east London suburbs and the western fringes of Kent. An approach from Transport for London (TfL) in 2013 to seek approval from KCC to their proposal for the transfer of the franchising authority for the Southeastern Metro rail services from the Department for Transport (DfT) to TfL was opposed by KCC at this time. The proposal did however present KCC with the opportunity to commission detailed consultancy work on the likely impact of the transfer of these Metro services, on both London and Kent.

The report (attached) provided some very useful data concerning current and projected usage of the south-east London Metro network and highlighted particular concerns, specifically around ticketing and performance issues on certain routes through south-east London to the capital's termini. For the purposes of this response, the WSP report contains much useful data, and the NIC may find some of its material helpful in determining the need for particular infrastructure improvements in the south-east London Metro operating area.

Subsequently, KCC has responded favourably to a new proposal from the Greater London Authority (GLA) for the transfer of south-east London Metro services to TfL. Following an agreement between KCC and TfL which protects the interests of Kent's rail passengers through the inclusion of three 'red lines' in respect of fares, paths and capacity, KCC has now agreed in principle to the future transfer of these services at, or shortly after, the start of the new franchise for the Southeastern operating area in 2018.

2. What are the strategic options for future investment in large-scale transport

infrastructure improvements in London - on road, rail and underground - including, but not limited to, Crossrail 2?

Lower Thames Crossing

For many years KCC has promoted the need for a new Lower Thames Crossing that will cater for strategic traffic and the county's function as the gateway to continental Europe, as well as providing greater connectivity with Kent's immediate neighbours to boost local and national economic activity and productivity. The existing Dartford-Thurrock River Crossing (A282 trunk road) is a significant link in the strategic road network, facilitating the movement of goods and people from Kent across the Thames to Essex and the North. The crossing is used by over 50 million vehicles each year, which is well above its design capacity. This lack of capacity results in congestion and unreliable journey times. Recent attempts to improve the crossing by removing the toll-booths and encouraging free-flow traffic have seen positive results but nevertheless traffic volumes continue to grow at the crossing and congestion will soon return to the levels seen before the improvements.

With the Garden City development at Ebbsfleet comprising a predicted 15,000 new homes, and the proposed Paramount development on the peninsular forecasting 27,000 new jobs, the need for the Crossing is ever more pressing. The delivery of a third crossing is vital to support the future growth of London, the South East and the UK as a whole.

KCC supports the provision of a new Lower Thames Crossing to the east of Gravesend and Thurrock connecting the M2 with the A13 and the M25 between Junctions 29 and 30, including improvements to the A229 to improve the link between the M2 and M20 (known as 'Option C variant' in DfT consultation to date). This option provides a clear opportunity for the DfT to radically improve capacity and resilience of the road network crossing the Thames, but also to provide urgently required resilience for the strategic network across Kent between the Ports (Eurotunnel and Dover), the Midlands, and the North. KCC has commissioned research into the benefits of the new crossing and concluded that Option C variant has the greatest economic benefits, primarily through job creation and housing growth. The improved connectivity resulting from the new crossing would attract businesses to north Kent/south Essex. Improved journey time reliability would enable residents to access more employment opportunities, effectively increasing the size of the labour market.

A KCC commissioned study by KPMG in 2010 concluded that a new crossing to the east of Gravesend would directly create 6,000 jobs and contribute £12.7 billion to local GVA. In a further study, URS (2012) carried out demand analysis showing that the new crossing would improve development viability and unlock economic growth. By implementing Option C variant in conjunction with upgrades to the A2/M2 corridor (M2 Junction 7 improvements and dualling the A2 north of Dover) a second strategic route between Kent and the North would be created, which is vital to keep London and the rest of Britain connected to the Port of Dover. Another study commissioned by KCC (Gowlings, 2012) has shown that there is a high level of interest from potential financiers, meaning that it is an attractive investment that could be delivered quickly by the private sector.

As the growth of London extends eastwards, the infrastructure required to support it also supports Kent. KCC believes that the current level of congestion at the existing crossing, along with forecast traffic growth and the significant scale of potential development, means that a third crossing should be the top priority and included in the NIC's strategic vision for large-scale transport improvements in London.

The linking of HS1 and HS2

KCC has specifically raised the importance of a dedicated link between HS1 and HS2 through joint meetings with the London Boroughs of Hackney and Newham and other stakeholders who are equally determined to see the installation of what many regard to be a missing link in the eventual High Speed (HS) network. Originally the draft hybrid bill for HS2, phase 1 (London - Birmingham) included such a dedicated link, which would have left HS1 just to the north of St Pancras and joined HS2 to the north of Euston. However, to reduce the estimated costs of HS2 and to speed the bill's progress through Parliament, the link was removed from the hybrid bill.

The current draft legislation will therefore result in a gap, of no more than about two or three miles, between the London termini of both HS rail routes. The strategic opportunity of operating through domestic, and eventually international, services between locations north of London, Kent and continental Europe will have been missed.

KCC regards this missing link as an essential piece of London's transport infrastructure, and urges the NIC to consider the options for funding and Parliamentary support required for its delivery. We have seen in Kent the transformational effects of HS1: wider opportunities for travel to employment, leisure, business and higher education. It would be a missed opportunity for London's transport network if this short distance between HS routes were not bridged by a dedicated link. It would not need to be at the full high speed of either HS1 or HS2, but it must be included in any future list of key infrastructure transport projects in the capital.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

Crossrail 1 extension from Abbey Wood to Ebbsfleet and Gravesend

It is in the context of both the approved route of Crossrail 1 to Abbey Wood, and its putative extension eastwards, that KCC would support in principle the proposal for the Crossrail 2 scheme. The interchange between both Crossrail routes at Tottenham Court Road would be a key interchange in Central London, and would offer a wide range of journeys by rail with just one change for Kent passengers.

The principal large-scale rail transport infrastructure improvement that KCC would support would be the eastwards extension of Crossrail 1 from Abbey Wood to Ebbsfleet and Gravesend. An officer working group, led by the GLA and TfL, and including KCC and other interested authorities, is engaged in commissioning consultancy services to scope a Business Case into this proposal. KCC regards such an extension as essential in providing the necessary rail transport infrastructure to meet the planned growth in demand for rail transport between north-west Kent and London.

Crossrail 1 services will commence operation to Abbey Wood, which is located on the boundary between the London Boroughs of Bexley and Greenwich, in December 2018. The full Crossrail 1 route will be operational from December 2019, offering through services from Abbey Wood or Shenfield (Essex), via Liverpool Street and Paddington, to Heathrow or Reading. It will transform rail travel in and through the capital, and for Kent passengers will offer a single change at Farringdon from Thameslink services giving direct access to many West End destinations and Heathrow.

There has for been a long term aspiration held by, among others, the London Borough of Bexley for an eastwards extension of Crossrail 1. The line of route would follow the existing North Kent line from Abbey Wood, serving Belvedere, Erith, Slade Green, Dartford, Stone Crossing, Greenhithe and Swanscombe before serving Northfleet / Ebbsfleet International. It would then continue to, and terminate at, Gravesend, with turn-back and light maintenance facilities at Hoo Junction. This route has been safeguarded by all the affected planning authorities.

This project is crucial to London's transport infrastructure, as well as to that of north-west Kent and the Thames Gateway / Ebbsfleet area. It will, if approved, funded and delivered, provide a key rail transport corridor with frequent and reliable services direct to the West End and Heathrow, alleviating overcrowding and congestion on the exiting Mainline and Metro services which currently serve this and adjacent routes. It will also be imperative in providing the additional capacity required by the emerging Ebbsfleet Garden City through the Ebbsfleet UDC and, if it is approved, the proposed Paramount Leisure Park on the Swanscombe peninsula.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

In the United Kingdom, the example of Transport for the North (TfN), centred on but not exclusive to Greater Manchester, has established a template for the creation of further integrated transport authorities in other metropolitan areas. It is probable that the lessons learned in the creation and functioning of TfL, formed out of the former London Regional Transport and other transport authorities, would provide lessons and opportunities for TfN and other future transport authorities. The important point will be the opportunity for each metropolitan area to develop its own transport authority in a bespoke way that is appropriate for its location rather than to have a standard model applied throughout England.

As the largest non-metropolitan authority in England, KCC does not aspire to become its own transport authority. KCC regards the present arrangements, with significant influential input at all levels of Government, transport providers and operators by its members and officers, as the most effective way of procuring transport infrastructure in our county.

Finally, the proposed Strategic Transport Boards which are to be included in the new devolution deals will provide an opportunity for KCC to benefit from the increased level of devolved decision-making offered by Government. Following the success of the devolved funding granted through the LEPs, the new Strategic Transport Boards should enable local transport authorities such as KCC to adopt a more strategic approach to transport infrastructure investment throughout the county.

Conclusion

The provision of adequate transport infrastructure in London is key to the free movement of people, goods and services between London and the Home Counties, especially Kent. The areas highlighted above are the principal transport projects in which KCC is currently involved which have a direct bearing on this movement. KCC has also recently published its 'Growth and Infrastructure Framework' which includes estimates of future growth in employment and housing by district (including Medway). These statistics clearly demonstrate significant increases in both, especially in areas such as Ebbsfleet closest to Greater London.

The transport infrastructure for London and the greater south-east region clearly needs continued investment to ensure it is fit for purpose, for those living and working in the capital and for the ever greater numbers of people who will need to travel to London from Kent. KCC regards the work of the NIC as critical in ensuring the delivery of the transport infrastructure required to support the projected growth in employment and housing, in Kent and throughout the south-east.

Appendices

- 1 WSP Report: Southeastern Metro services – Transfer to TfL (WSP, 2013)
- 2 Crossrail 1 Eastern Extension – Economic Impact Study (TfL, 2015)

LONDON ASSEMBLY

Transport Committee | Regeneration Committee

London Assembly
City Hall
The Queen's Walk
London SE1 2AA

Lord Adonis
Chair
National Infrastructure Commission
1 Horse Guards Road
London
SW1A 2HQ

14 January 2016

Dear Lord Adonis,

Submission from London Assembly

We are writing to set out the views of the London Assembly Transport Committee and Regeneration Committee in response to the National Infrastructure Commission's call for evidence. We welcome this consultation on the major infrastructure challenges facing the UK, and hope it will lead to the Commission making a strong case for renewed investment in enhancing the transport network in London. Assembly Members look forward to discussing these issues with you further at the Transport Committee meeting on 10 February 2016.

This submission is based on the key findings of recent Transport Committee work on London's transport infrastructure in a range of areas, and the Regeneration Committee's investigation into transport-led regeneration schemes. It focuses on the delivery of Crossrail 2, upgrading and extending the London Underground, enhancing capacity on London's National Rail services, and the potential need for investment to support additional airport capacity in the South East.

The need to upgrade transport infrastructure in and around London is pressing, with the capital's population set to grow to over 10 million by 2036.¹ Huge numbers of new homes, at least 42,000 per year, must be built to address a severe housing shortage and accommodate London's growth.² As the Regeneration Committee found in its recent report, new transport infrastructure is often vital to unlocking the development of new homes and jobs.³ We are seeing this at the Barking Riverside development in east London, where the extension of the London Overground network underpins plans for around 10,800 new homes in the area.

The capital's transport network is already almost at capacity, and while Crossrail will add new capacity, London's growth means that this is likely to be fully utilised shortly after the line's opening. Meeting these needs will be challenging for Transport for London in the light of the recent Spending Review, which has put pressure on TfL's investment budget and did not include

¹ <https://files.datapress.com/london/dataset/2014-round-population-projections/update-03-2015-2014rnd-trend-proj-results.pdf>

² https://www.london.gov.uk/sites/default/files/gla_migrate_files_destination/London-Assembly-response-to-Draft-Housing-Strategy-FEB14.pdf

³ <http://www.london.gov.uk/about-us/london-assembly/london-assembly-publications/transport-led-regeneration>

any major commitment to investing in London's transport infrastructure.

Crossrail 2

The Commission is rightly focusing on Crossrail 2, a proposed scheme that has the potential to significantly increase capacity and connectivity across London and the wider South East region. The Government has previously indicated support for this scheme, although no further funding was promised in the recent Spending Review beyond the prospect of an application to the new Transport Development Fund. At the Regeneration Committee's recent briefing, Members heard that Crossrail 2 requires £250 million of development funding to ensure that the railway can be delivered by the early 2030s.

Crossrail 2 would provide sizeable economic benefits, supporting up to 200,000 new jobs, and regenerating parts of north east London that have relatively high levels of deprivation. In addition to helping meet London's housing and job needs, the timetable and phasing for Crossrail 2 is crucial so that it can alleviate crowding at Euston following the construction of HS2.

In order to provide the best value for money and take advantage of the skills and expertise developed during the Crossrail programme in London, we would recommend approving Crossrail 2 and commencing construction as quickly as possible. There are a range of potential funding sources for the scheme as a whole; TfL has suggested that, with fiscal devolution, around 50 per cent of the required funding could come from local sources.

London Underground

Of equal importance to London is the upgrade of the existing London Underground network. The tube is Britain's busiest railway and is becoming busier than ever, with records for passenger numbers repeatedly broken in recent weeks. Without a significant and sustained increase in tube capacity, the city risks grinding to a halt.

The ongoing Sub-Surface Upgrade Programme on the District, Circle, Metropolitan and Hammersmith & City lines is projected to increase overall capacity by 40 per cent on these lines by 2023. The New Tube for London programme on the Piccadilly, Bakerloo, Central and Waterloo & City lines will deliver between 25 and 60 per cent capacity increases by 2033. It is vital that TfL receives sufficient long-term funding to complete these programmes, which has not so far been confirmed.

In addition to the upgrade schemes, line extensions can also boost connectivity in and around London. In particular, we consider that the proposed extension of the Bakerloo line is a vital project for south east London. It will complement the regeneration of this area, boosting connectivity in Southwark and Lewisham in particular. It should be supported by the Commission.

National Rail

The Transport Committee has engaged with Network Rail on plans for upgrades to London's rail network in Control Period 6 (2019-2024). There are a number of key priorities for London, including releasing additional track capacity around East Croydon station, extending Crossrail to Heathrow Airport's Terminal 5, and four-tracking the Liverpool Street-Stansted route. We were pleased to see some of these projects being supported by Network Rail, although the subsequent reviews of the organisation and the delays to Control Period 5 projects have cast doubt over their future delivery. Network Rail's investment plans should be clarified as soon as possible.

The biggest challenge facing London's National Rail network is the need to move toward metro-style service provision in south London. There is a significant disparity in the city between parts able to access a high-frequency, high-capacity tube network (generally north of the River Thames), and others relying on National Rail services with much lower standards (mainly to the south). This is a constraint on economic growth and causes misery for many passengers using overcrowded, unreliable services. It is clear that this problem has not been given sufficient priority in recent years.

The Transport Committee has recently undertaken an investigation into the potential devolution of National Rail services to the Mayor and Transport for London. Devolution that has so far taken place – notably, the transformation of the Silverlink franchise into the London Overground network – has proven to be a great success. TfL has invested substantially in the network, improving reliability, capacity, service frequency and accessibility. As a large organisation with a diverse revenue base, TfL is much more able to manage the risks of this type of investment than private franchisees. We advocate further devolution, beginning with suburban routes of the South Eastern franchise in 2018, a move supported both by rail passengers both in London and Kent.⁴

Orbital rail

A more general, long-term priority for London's transport infrastructure should be the development of orbital links, whether light or heavy rail. This would support the growth of other economic centres outside the Central Activities Zone, by creating employment opportunities in areas such as Croydon. The Transport Committee also found in a recent investigation into National Rail services, that Kent-based commuters would benefit from better connections to east London, to avoid interchange in central London, which would have the additional benefit of reducing crowding for London-based passengers.⁵

Airport expansion

Finally, we would like to address the issue of surface transport access to airports serving London. We understand that the National Infrastructure Commission is not seeking views on whether or where additional runway capacity should be provided in the South East, and our comments do not indicate support for expansion. However, we believe it is vital the Commission recognises that the surface transport implications of whatever decision the Government makes – should it decide to proceed with airport expansion – are huge.

As the Transport Committee set out in a submission to the Government, the Committee is deeply concerned that the Airports Commission's final report did not set out realistic plans for how much additional transport capacity would be required to serve an expanded Heathrow Airport, or a meaningful estimate of the costs of upgrading infrastructure, if a third runway is approved.⁶ Before any final decision is made the Commission should undertake analysis to make a more informed recommendation to the Government about the surface transport implications of expansion at both Heathrow and Gatwick Airport.

⁴ <https://www.london.gov.uk/about-us/london-assembly/london-assembly-publications/devolving-rail-services-london>

⁵ <http://www.london.gov.uk/moderngov/documents/s49213/Appendix%20%20-%20Notes%20of%20Sevenoaks%20meeting.pdf>

⁶ <https://www.london.gov.uk/about-us/london-assembly/london-assembly-publications/surface-access-upgrades-essential-third>

We hope that you find this submission to be useful as you consider the transport infrastructure challenges facing London, and will welcome the chance to discuss them further with Assembly Members at City Hall in February.

Yours sincerely,

Handwritten signatures of Valerie Shawcross and Gareth Bacon. Valerie's signature is on the left and Gareth's is on the right.

Valerie Shawcross CBE AM
Chair, Transport Committee

Gareth Bacon AM
Chair, Regeneration Committee



Andrew Adonis
Interim Chair
UK Infrastructure Commission

[contact redacted]

Website: www.lbbd.gov.uk

Reference:

Date: 24 December 2015

Dear Andrew Adonis

National UK Infrastructure Commission call for evidence - London's transport infrastructure

Thank you for giving the London Borough of Barking and Dagenham the opportunity to provide our views on London's long term infrastructure needs. Barking and Dagenham is London's Growth Opportunity with the potential for 35,000 new homes and 10,000 new jobs over the next fifteen years but this is only possible with significant investment in transport infrastructure. Therefore please find at Appendix 1 the Council's response to the questions set by the Commission which we would be delighted to discuss further.

Yours sincerely

Daniel Pope
Group Manager Development Planning

Phone: 020 8227 3929

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Our address: Town Hall, 1 Town Square, Barking IG11 7LU

Appendix 1

National UK Infrastructure Commission call for evidence - London's transport infrastructure

What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

- 1.1 London's population is forecast to increase to over 10 million people by 2030. Within this Barking and Dagenham's population is forecast to grow by 30% and is only second to Tower Hamlets in terms of population growth. It also has the country's youngest population. Barking and Dagenham is London's Growth Opportunity with the potential for 35,000 new homes and 10,000 new jobs by 2030. It is at the epicentre of the Royal Docks, Upper and Lower Lea Valley, London Riverside and Thames Gateway Growth Areas. The Council is committed to growth, to playing its role in London and delivering for its community. It has ambition and aspiration to become a destination of choice, where people stay and feel welcome.
- 1.2 The major economic and social challenges facing London over the next two to three decades are meeting housing need, access to jobs, health inequalities and ensuring people have the right skills to compete for tomorrow's jobs. As evidenced by the Marmot Review "Fair Society, Healthy Lives" these issues are interlinked.
- 1.3 Nowhere in London are these issues collectively more pronounced than in Barking and Dagenham. At the same time nowhere in London is there the scale of opportunity to address these challenges provided the right investment in transport and social infrastructure is secured.
- 1.4 The major issues for Barking and Dagenham are:
 - Ensuring 35,000 are delivered and that these are real homes for real people i.e. homes that people working in London can afford and chose to live in.
 - Ensuring that transport connections enable these people to access jobs in growth areas of Central London, Royal Docks and the Lower and Upper Lea Valleys.
 - Ensuring that new communities have the prerequisite social infrastructure and are designed to enable people to lead healthy lifestyles and access high quality lifelong learning opportunities to give them the skills and confidence to compete for London's jobs.
 - To deliver growth in a way which empowers people to do more for themselves whilst strengthening the institutions which support local communities. This includes ensuring the proceeds of growth are maximised to sustain vital local services.

- 1.5 If these issues are not addressed London's economy will suffer as businesses will not be able to attract employees as they will be priced out of the capital due to the double whammy of not being able to afford to either live in London or afford to commute into London from cheaper areas.
 - 1.6 There exists an opportunity to prove that London can still be a place where people on low to medium incomes can afford to live and chose to live; a city which still functions as a place; a smart place which embraces technology and real time data to enable people to live healthy and sustainable lives and to access lifetime learning opportunities; a place where development is designed to meet the needs of people of all ages, which foster social interaction, and where walking and cycling are the default options for short journeys. That place is Barking and Dagenham.
-

What are the strategic options for future investment in large-scale transport infrastructure improvements in London – on road, rail and underground including, but not limited to Crossrail 2?

How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?

What might their potential impact be on employment, productivity and housing supply in London and the south east?

- 1.7 Improved transport infrastructure is vital to London's future global competitiveness.
- 1.8 The Council is concerned that the traditional cost benefit ratio using the WebTag business case methodology fails to capture the economic benefits of the development that new transport infrastructure can unlock. For this reason the Council considers that the Gross Value Added generated by new homes and jobs must also be taken into account.
- 1.9 The Council is also concerned that the focus on funding sources such as Community Infrastructure Levy and Tax Increment Funding can work against low value areas such as Barking and Dagenham. This results in transport investment being focused in high value areas where the proceeds of development are higher and where transport schemes rely less on Government funding. However this accelerates the delivery of unaffordable homes out of the reach of normal Londoners and frustrates the delivery of real homes for London's workers in affordable places like Barking and Dagenham. These are homes for workers on low and medium incomes who are vital for the functioning of London's economy. To address this, the Council as part of the

North East London Strategic Alliance, has been making the case for the devolution of stamp duty receipts to help fund strategic transport schemes and this should be considered in the Commission's review.

- 1.10 Therefore investment in large-scale transport infrastructure improvements should be prioritised taking into account not only how much growth they will unlock but what sort of growth, who ultimately will benefit from the investment? Investment in Barking and Dagenham will benefit Londoners as it will unlock the delivery of homes within reach of the average London worker enabling them to live near to where they work. Unlike higher value areas the investment is also more critical as other sources of funding are less readily available.
- 1.11 There are four large scale strategic transport improvements in London which Barking and Dagenham consider are crucial to the success of London's economy as they will unlock the 30,000 new homes planned in London Riverside and connect them to the 215,000 new jobs planned in Canary Wharf, Royal Docks and Upper and Lower Lea Valleys. These improvements will allow people living in these new homes to enjoy relatively short journeys to work thus addressing a major factor in London's poor productivity. They will also alleviate pressure on already overcrowded transport infrastructure which is harming London's economic competitiveness.
- Crossrail 2 eastern spur
 - Riverside Tunnel and Castle Green
 - Gallions Reach River Crossing and DLR extension to Barking Riverside
 - London Overground Extension from Barking Riverside to Abbey Wood

Crossrail 2 eastern spur

- 1.12 There is a strong case for a Crossrail 2 eastern spur which clearly delivers significantly greater regeneration benefits than an extension to New Southgate.
- **Regeneration potential of London Riverside and wider Thames Gateway area** – Over 30,000 new homes and 10,000 new jobs are forecast to be delivered within London Riverside by 2030. This growth will inevitably lead to further pressure on already overcrowded rail services. Crossrail 2 would have a transformative affect on Barking Town Centre connecting Stratford which is East London's largest growth centre and the Thames Gateway which is the region's largest growth corridor. It is clearly an anomaly that as it stands neither London Riverside or Thames Gateway Essex is due to be served by Crossrail.
 - **Supporting population and employment growth** – In TfL's own sensitivity testing of route options for population and employment growth, it

was suggested that a Crossrail 2 eastern branch option could generate 52% of all population growth and 79% of all jobs growth in the Greater London Authority (GLA) area between 2031 and 2041 (equating to some 100,000+ extra people and 85,000+ additional jobs in that period). Whilst the borough's proposals for a Barking Town Centre Housing Growth Zone would deliver 5000 new homes over the next ten years ultimately Crossrail 2 could provide a catalyst for double this in the longer term. Moreover beyond the sites currently indentified in the London Riverside Opportunity Area Planning Framework, Crossrail 2 could reshape the industrial areas along the line by raising land values and transforming the prospects for new jobs and homes in areas currently undervalued and underutilised. These areas include Rippleside and parts of the Ford estate. The economic case for an eastern spur to Crossrail 2 is therefore extremely strong.

- **Benefits for passengers and train operations** – After Stratford, Barking is the best connected town centre in East London so it makes sense for it to be served by Crossrail 2. An eastern spur would transform Barking by providing an interchange between rail services from London Riverside and the Thames Gateway Essex growth areas. An eastern spur would provide, for people travelling from London Riverside and the Thames Gateway Essex growth areas, an interchange between Crossrail 1 and 2 services at Stratford a link to High Speed 1 and 2 at Euston St Pancras and interchange onto London Overground and London Underground services at Barking. Network Rail's long term demand projections indicate an increase in peak hour passenger demand in the range of 24% - 46% on services into London Fenchurch Street station to 2043.

1.13 The London Boroughs of Hackney, Newham and Havering and Essex County Council, have recently commissioned a joint study to explore the feasibility of an eastern Crossrail alignment and to present an outline business case for its development. It is the intention that the study, due to be completed by the end of February 2016, will provide a sound basis for further discussions with the Mayor of London, TfL and other relevant stakeholders.

Riverside Tunnel and Castle Green development opportunity

Background

- 1.14 The Roads Task Force Commission (RTF) was set up by the Mayor of London in 2012 to tackle the challenges facing London's streets and roads. This independent body brought together a wide range of interests and expertise, united in the belief that the Capital needs a long-term strategy for roads and a commitment to major investment in street management and urban design. The RTF report, published in July 2013, sets out a vision of how London can cope with major population growth and remain one of the most vibrant, accessible and attractive world cities.
- 1.15 Based on experiences of other major cities across the world it recommended undergrounding roads to reduce traffic congestion and attendant impacts and enable regeneration. In response the Mayor and TfL considered more than 70 locations across the capital for tunnels, flyunders and decking. In February 2015 the Mayor identified the A13 tunnel, between Lodge Avenue and Gale Street, as one of the top 5 locations for further feasibility. In developing business cases for these five tunnels the A13 was identified as most feasible and is now TfL's preferred scheme. TfL see this as a demonstration project with potential for application across London. It is untenable not to deal with the problems of air quality, severance and blight and inefficient land use that surface trunk roads cause across London.

Benefits

- The Riverside Tunnel unlocks land for over 5000 new homes and 1000 jobs on a development site known as Castle Green. These are additional homes to those identified in the London Plan and therefore help bridge the capacity gap the Mayor needs to cover between housing need and supply.
- This is the most prominent site in Barking and Dagenham, 100,000 vehicles pass it each day as well as thousands of commuters on the trains into and out of London. They form their image of the borough and East London from this site. The tunnel unlocks redevelopment enabling old, tired and eyesore industrial buildings to be replaced with modern visually stimulating development providing a fitting gateway to the 16,000 new homes planned at Barking Riverside, Thames Road and Creekmouth, 5000 at Barking Town Centre and 3500 at Beam Park and Ford Stamping Plant, enhancing values and increasing viability of development in these locations.
- The A13 is one of the 5 most polluted roads in London and breaches EU limits. The tunnel would be fitted with filtration system to remove pollutants significantly enhancing air quality for communities either side.

- The Riverside Tunnel overcomes the severance caused by the A13 which is a monumental psychological and physical barrier separating communities north and south and enables public transport to run between them.
- It improves journey times by removing the Renwick Road lights and Lodge Avenue flyover bottlenecks and improves resilience as the Lodge Avenue flyover is an accident hotspot and common location for breakdowns

Business case

- By 2036, more than 40% of East London's housing and 60% of jobs growth are due to be delivered within 2 miles of the A13 and the DP World port and logistics park continues to grow.
 - The Tunnel will cost £700m to construct and £260m to acquire land at today's prices. There is the potential for Community Infrastructure Levy, New Homes Bonus, road user charging and land value uplift to cover a significant proportion of the tunnel cost. This proportion could increase if stamp duty is devolved. The majority of the tunnel cost therefore is directly generated by the tunnel itself and would not be available otherwise.
 - Over the 60 year appraisal period using TfL's London Value of Time (VoT), the net present value (NPV) of the tunnel scheme is estimated at £617m due to journey time savings. These are highest for journeys of 20km plus which is why there is support from Essex MPs and it also has a positive impact for freight from Essex including London Gateway. The Riverside Tunnel generates a Gross Value Added of £791m due to the additional jobs and homes it unlocks.
 - In a 'with development' scenario, the scheme has a Benefit Cost Ratio of 1.85 representing "medium" value for money. However this doesn't account for the wider regeneration and strategic benefits that this development would unlock for London, which would include thousands of much needed homes.
 - This is not radical. It has been done in Oslo, Paris, Madrid, Boston and many other cities but it will be first of many in UK. TfL will use tunnelling expertise from major projects such as Crossrail and TfL is committed to CPO powers to assemble land at Castle Green.
-

Gallions Reach River Crossing and DLR extension to Barking Riverside London Overground Extension from Barking Riverside to Abbey Wood

- 1.16 Following the Mayor of London's decision in 2009 to abandon the Transport and Works Act for the Docklands Light Railway Extension from Beckton to Dagenham Dock the Council has worked hard with Transport for London to secure the future of the 10,800 homes at Barking Riverside by progressing the London Overground Extension as an alternative. This extension also provides passive provision for a station at Renwick Road to serve the 5000 new homes planned at Castle Green.
- 1.17 The Transport and Works Act (TWA) application for the London Overground Extension from Barking Station to Barking Riverside is due to be made in 2016 and the service is due to be operational in 2020. The S106 for Barking Riverside does not allow more than 1500 homes to be occupied until the TWA is authorised. Therefore the London Overground extension unlocks 9300 homes. However there exists capacity for a further 10,000 homes on former industrial land around Barking Riverside but this requires further transport improvements to unlock it. The Council considers that there remains a strong business case for extending the Docklands Light Railway across the River Roding to supplement the London Overground Extension and to deliver a further 10,000 homes.
- 1.18 Transport for London recognise this and as part of the current consultation on River Crossings have put forward a number of options for future extensions of the DLR including options across the River Roding to either Barking Riverside or Barking.
- 1.19 This would provide a convenient link to the 1000s of new jobs planned at the Royal Docks and the Crossrail Station at Custom House as well as potentially provide a link to growth areas south of the River and allow the London Riverside and Royal Docks Opportunity Areas to be planned and to function as one integrated growth zone.
- 1.20 The Mayor's Infrastructure Plan and his recent publication "Connecting the Capital" supports the proposal for a further extension of the London Overground line from Barking Riverside to Abbey Wood Crossrail Station. This is the missing link in the Mayor's aspiration to create a London orbital railway and would unlock the growth potential of the Thamesmead and Bexley Opportunity Area which has capacity for 21,500 homes and 8,500 jobs and also provide a convenient link from Barking and Barking Riverside to the Abbey Wood Crossrail Station.
- 1.21 Collectively the London Overground Extension with new stations at Renwick Road and Barking Riverside with an interchange at Abbey Wood and a DLR Extension to Barking Riverside and potentially Dagenham Dock would serve

50,000 new homes a similar number of homes to those planned in the Upper and Low Lea Valleys combined.

National Infrastructure Commission
1 Horse Guards Road
London
SW1A 2HQ

19th December 2015

Dear National Infrastructure Commission,

RESPONSE TO NATIONAL INFRASTRUCTURE COMMISSION CALL FOR EVIDENCE

Please accept this letter as London Borough of Brent's response to the National Infrastructure Commission's (NIC) call for evidence on the following three issues:

1. Improving connectivity between cities in the north of England
2. Large-scale transport infrastructure improvements in London
3. Improving how electricity demand and supply are balanced

Brent appreciates the opportunity to contribute towards the NIC's work and the Borough supports the process currently being undertaken by the Commission. The following response has been prepared based on the questions put forward by the NIC for each issue.

ISSUE 1: IMPROVING CONNECTIVITY BETWEEN CITIES IN THE NORTH OF ENGLAND

Brent has no comment on the issue of connectivity between cities in the north of England. We support Local Authorities in the north of England who wish to comment on this issue.

ISSUE 2: LARGE-SCALE TRANSPORT INFRASTRUCTURE IMPROVEMENTS IN LONDON

Q1: What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

Brent is facing many of the same economic and social challenges as London and the United Kingdom as a whole. Sustained high population growth is a challenge across many policy areas, including housing, transport and employment. Brent's population is projected to grow by 24% to almost 390,000 over the period from 2012 to 2036 compared to 22.5% growth London-wide over the same period¹. This growth will place greater pressure on housing and services which are already straining to cope with record populations and usage, such as transport. In addition, it's a continuing challenge for the borough to support employment growth within the borough to provide jobs and economic stimulus for residents.

In recent years, the dynamic of these challenges has also changed, with greater focus on sustainable development. This trend is likely to continue in the future, with an increasing focus

¹ Office of National Statistics, 2015, *ONS 2012-based subnational population projections*, [Sourced from London Datastore] <http://data.london.gov.uk/dataset/ons-2012-based-subnational-population-projections/resource/dfdd7444-ea66-4a27-91ffa95fdc9fe611#>

on car-free development and localised employment and services, thus reducing the need to travel, along with the provision of sustainable transport options, such as walking and cycling in addition to public transport.

In order to deal with these challenges, significant investment is required in local transport infrastructure, including resolving existing maintenance requirements on local road networks. At the same time, investment is also required in large both new large-scale infrastructure (such as the Crossrail/West Coast Main Line link) and the modernisation of existing infrastructure (such as the Bakerloo line modernisation).

Q2: What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

Brent believes that the greatest opportunity for investing in transport infrastructure in London is not in the strategic network, but in the local network. It is local transport networks which are currently suffering from deferred maintenance and lack of investment due to funding cuts, while additional funding is being made available for strategic transport networks, which, while important, do not carry the vast majority of vehicles (either passenger or freight) and can not support economic growth without a well maintained local network. At the same time, we recognise that funding must be provided to the strategic network as well. We do not see the demands of the different networks as an 'either-or' scenario, rather investment must be directed towards both networks to ensure the delivery of high quality national transport networks which support economic growth and improve peoples' wellbeing.

At a strategic level (both nationally strategic and regionally strategic), there are a number of major schemes which Brent supports:

West Coast Main Line / Crossrail link:

This project is Brent's highest priority transport project, on the condition that Crossrail trains call at Wembley Central Station. This project will support substantial regeneration in Wembley, along with providing high speed, high quality access for residents and businesses to Central London, Heathrow and the rest of the nation via the Old Oak Common Interchange.

Brent continues its work with Transport for London (TfL) on this issue and we would encourage Central Government and any other stakeholder to support it.

Upgrade and extension of the Bakerloo Line:

In addition to supporting growth in southeast London, the Bakerloo line currently has the oldest rollingstock on the London Underground network, dating to 1972. These trains are in considerable need of renewal, in addition to the need to modernise track and signalling along the route.

An upgrade of the Bakerloo Line, completed in conjunction with an extension in southeast London would improve access to public transport, reduce car usage and associated emissions and congestion across northwest London. The extension would support regeneration in Wembley, South Kilburn and Old Oak Common / Park Royal, improve journey times and provide better connections, improving public transport capacity and passenger satisfaction along the length of the Bakerloo Line.

High Speed 1 / High Speed 2 link:

While this project has been excluded from the HS2 Hybrid Bill, currently before parliament, Brent believes it is essential towards achieving a comprehensive national High Speed Rail network in the future. At the same time, the previous proposal via the North London Line in Camden, impeded the capacity of this route and would have had a detrimental impact on local communities.

An improved solution needs to be developed now, so that other projects do not jeopardise the practicality and deliverability of this link in the future.

Electrification of transport networks (road and rail):

Brent supports the electrification of transport networks (including both road and rail vehicles) for both freight and passenger services. While rail electrification works are planned with lengthy lead-in periods, the electric vehicle market is less certain, and as these vehicles become cheaper and more widely spread, there is a risk that domestic energy consumption could rise considerably for these vehicles. This could potentially require additional infrastructure to support these vehicles.

Increasing the uptake of electric vehicles in commercial fleets and household vehicles is predicated on having sufficient charging infrastructure to give people the confidence to switch to a hybrid or fully electric vehicle. Domestic infrastructure, coupled with nation-wide charging infrastructure is essential to ensuring that the nation's homes, offices businesses are prepared for zero-emission vehicles of the future.

Freight transport networks:

An essential requirement of any strategic infrastructure is the provision for freight to utilise the network. Pursuant to this, where possible, Brent strongly supports the relocation of freight from road haulage to rail, given the impacts on local amenity of poor air quality, traffic noise and safety risk of freight vehicles. We also support maintaining and/or improving access in the form of service slots and sidings for freight to rail networks, such as the West Coast Main Line, Dudding Hill Line and the Midland Main Line.

Cycling infrastructure:

While cycling infrastructure has generally not been considered to be strategic infrastructure, with the addition of high-capacity cycling infrastructure currently being constructed and/or planned across Greater London, along with the demand for greater cycling provision means the scale of infrastructure and popularity of cycling is increasing. The greater number of cyclists will generate additional demands on strategic road networks and for regional cycling infrastructure. These considerations should be taken into account both for strategic planning and in assessing individual traffic schemes.

Resolution of London's air capacity issue:

In February 2015, Brent Council wrote to the Davies Commission to recommend that of the three options being considered to increase London's air capacity, Brent's preferred option was the Heathrow Northwest Runway. The Davies Commission agreed with this and recommended the government move forward with this option. A final decision on how the government will proceed has been delayed several times. Ongoing uncertainty regarding whether an additional runway will be built at Heathrow or Gatwick Airports, or not at all affects the planning and transportation decisions being made by Brent, other Local Authorities and TfL. Resolution of this issue needs to be a priority in consideration of national infrastructure.

Q3: What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Brent understands that Transport for London has already undertaken considerable work to evaluate and increase the benefits of the proposed Crossrail 2 scheme. In spite of not being located on the route for Crossrail 2, Council officers have been kept abreast of the project's evolution as there are potential long-term impacts for the borough in relation to connections to Crossrail 1 (at Tottenham Court Road) and HS2 (at Euston), along with the interchange between these two projects at Old Oak Common.

Given that the opportunities for increased benefits will come with greater demands on local authorities along the route, Brent will reserve contribution on this question to those authorities.

Q4: What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

Brent supports the funding arrangements for Crossrail 2, as currently outlined by TfL. We believe that it is fair and reasonable that large-scale, transformative infrastructure projects (including Crossrail 1 and Crossrail 2) should be funded by a combination of Central Government funding, Greater London Authority (GLA)/TfL funding, S106/Community Infrastructure Levy development contributions and localised business rates supplements for beneficiaries of the scheme.

A key consideration of equity which must be addressed for Crossrail 2 and future regional schemes such as this is the disparity of power for enforcing localised contributions between local authorities under the GLA and those located in the Home Counties. It certainly is achievable to come to negotiated settlements on funding agreements with these local authorities, however the Mayor of London does not have any authority to enforce them outside of the terms of the agreement. This will be of particular concern for Brent in support of the Crossrail / West Coast Main Line link, which will travel through the London Boroughs of Brent and Harrow, before continuing through Three Rivers District, Watford, and Dacorum Councils, which are all located outside of Greater London.

Q5: How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

No specific comments on this question.

ISSUE 3: IMPROVING HOW ELECTRICITY DEMAND AND SUPPLY ARE BALANCED

We have no specific recommendations for action on this issue, however we would note our concern regarding the challenge of ensuring continuity of electricity supply (across both the high voltage and low voltage networks) given projected population and employment growth, particularly in areas designated for regeneration, such as Old Oak/Park Royal. Of interest to the Council is how these services will be accommodated; particularly where they are proposed within the public highway and may affect transportation networks, other services or potential infrastructure improvements. In addition to this, Brent would be interested in opportunities for data to be shared, and upgrade works to be coordinated between utility providers so as to minimise disruption to residents and businesses.

I trust this response has been of some assistance, however if you have any questions, please feel free to contact our Transport Planner, Chris McCanna, on 020 9387 5424.

Thank you for your consideration.

Yours sincerely,



Tony Kennedy
Head of Transportation

London Borough of Camden's response to National Infrastructure Commission Call for Evidence – London's Transport Infrastructure

1. General comments

This response has been agreed by Camden's Cabinet Member for Regeneration, Transport and Planning.

Answers are given below to Questions 1-3 in the call for evidence. Further evidence is set out under 'References' at the end of this submission.

2. Question 1 - What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

Camden has a very successful and diverse economy and it makes a significant contribution to the UK economy (with the 5th largest GDP of any local authority district in the UK) and is a key part of Central London's economy owing to its concentration of businesses, retail and tourism (Camden's GDP is the third largest of any London borough after the City of Westminster and City of London).

The borough is forecast to grow from 229,700 residents (in 2013) to over 265,000 by 2031 and the number of jobs to increase from 286,000 to 375,000 by 2031. This builds on historic rates of high growth recorded in Camden. Between 2004 and 2014 residents numbers grew by 13% while employment levels increased by 30%.

The level of development activity attests to the attractiveness and dynamism of Camden's local economy. In the decade 2005-15, 7,493 homes were built and 689 schemes involving employment floorspace were completed creating 453,742 sqm of office/industrial/warehousing floorspace and 59,000sqm of retail floorspace.

The London Plan housing target for Camden is about 8,900 additional homes from 2015-25 however London boroughs are advised to achieve and exceed this target in order to close the gap between London's needs and the supply of housing. LB Camden's emerging Local Plan aims to deliver a minimum of 16,800 homes from 2015-30 (including over 11,000 self-contained homes¹). A profound shortage in the number of affordable homes in London and the rapid growth in house prices and rents mean that more people are choosing to live outside the capital increasing the levels of commuting. A million people currently are commuting across Greater London's boundary every day into the capital. Without significant growth in the provision of affordable housing there is a risk that many businesses and the public sector will experience greater difficulty in attracting and retaining staff. Rising housing costs mean that residents are faced with spending an increasing proportion of their income on housing or living in cramped accommodation.

Camden's 'daytime population' already approximately doubles due to the influx of workers, let alone students and visitors travelling into the borough daily for a variety of purposes. Camden's night-time economy is also significant. In addition we have large numbers of people in transit throughout the borough. With population growth

¹ Self-containment is where all the rooms in a household's accommodation are behind a single door which only that household can use.

expected in the region of 2,300 people a year until 2031, the challenge is to ensure that this is supported by healthy and sustainable transport choices. Camden's screenline counts show that between 2006-2014, trips by car reduced by 13% - a trend which is expected to continue as the proportion of households without access to a car continues to increase (from about two-thirds currently). A sharp increase in cycle journeys has also been recorded. In 2006, cycling represented about 7.6% of Camden's traffic flow but in 2015 it was 13.6%. This is expected to continue to increase as a result of major investment in the cycling network in Camden and London.

3. Question 2 - What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

- How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?
- What might their potential impact be on employment, productivity and housing supply in London and the southeast?

Crossrail 2

Transport for London consultation exercises have demonstrated that the 'regional option' of Crossrail 2 has greater support than the 'metro option' and is better suited to meet the needs of London's growing population and employment. It provides new connections across the London region directly into the heart of the capital and opens up significant regeneration opportunities, particularly by increasing the scope for new housing that London needs in areas such as the upper Lee Valley. Camden Council has recently provided a detailed response to the Crossrail 2 Growth Commission – call for evidence, which is attached to this submission.

In summary, the Council supports the principle of Crossrail 2 because of the benefits that it offers to Camden residents, businesses and institutions and to London as a whole. Through increasing capacity and connectivity, Crossrail 2 would support the conditions for continued economic growth, bringing vital jobs and business activity to the borough. By reducing congestion on current transport routes the scheme could mean faster and less crowded train and bus journeys for Camden's residents and visitors. Without Crossrail 2 the Underground platforms at Euston, already operating close to capacity, would not be able to cope with the additional demand generated by High Speed 2 leading to the intermittent closure of Euston Underground station when demand related to HS2 and National Rail services peaks. This would be similar to the intermittent closure of Oxford Circus Underground station currently experienced.

The current plans for the Crossrail 2 station at Euston show that around 130 homes and 17 businesses may be directly affected by its construction. These proposals have come about as a result of uncertainty over the redevelopment of the current Network Rail station at Euston which fails to realise the opportunity to incorporate the

renewal of the 'classic' Network Rail station as part of the proposed build programme.

A large proportion of this impact – and cost - is unnecessary and could be avoided by re-locating the proposed Crossrail 2 station entrance within the footprint of a redeveloped Euston station. A comprehensive redevelopment of the station integrating Crossrail 2, High Speed 2 and the 'classic' Network Rail station would deliver ongoing efficiencies and a better passenger experience at the interchange in perpetuity and mean the full opportunities for development and growth can be realised.

Euston Station comprehensive redevelopment

The most significant barrier to the delivery of additional growth at Euston is the risk of failing to integrate and co-ordinate the redevelopment of the existing Euston Station in conjunction with the proposals for the High Speed 2 and Crossrail 2 stations. By co-ordinating projects there are opportunities to share worksites, speed up delivery, reduce land take and create a comprehensive redevelopment above an integrated jointly delivered transport interchange between High Speed 2, commuter lines, the Underground, buses and Crossrail 2.

The Euston Area Plan (EAP) is the agreed opportunity area planning framework for Euston, jointly prepared and adopted by Camden Council, the Greater London Authority (GLA) and Transport for London (TfL) with HS2 and Network Rail providing technical support. It sets out the potential for transformational development and regeneration above and around the station with the potential to deliver 2,800-3,800 new homes (including the delivery of much needed affordable homes) and 7,700-14,100 new jobs. This vision encompasses a high quality development around a world class transport interchange, resolving the issues around movement between rail, Underground, bus and taxi services and would reconnect communities to the north, south, east and west. Links between the station and the surrounding street network are poor and the linear bus street at the front of the station is a barrier to permeability and provides a poor environment. Investment in the public realm and facilities for cyclists would help provide a more legible and safe environment and support non-polluting and healthier means of travel.

The Euston Growth Strategy (prepared by Camden Council, the GLA, TfL and Network Rail) indicates that a comprehensive redevelopment could generate a development value of circa £3bn, an additional £1.1bn of GVA per annum and return approximately £1.3bn to the exchequer up to 2060.

The lack of funding for the redevelopment of the classic Network Rail station puts the delivery of the shared strategic vision and development parameters set out in the Euston Area Plan at risk. Without a comprehensive approach to the station the significant growth and regeneration potential at Euston will not be fully realised. The benefits of much increased permeability, connectivity and ease of movement will be compromised and this uncertainty mars the prospect of harnessing developer interest in a comprehensive approach. Failure to bring about the timely redevelopment of the Network Rail station would prolong the severity and duration of

impacts on the local community which are already set to experience 17 years of construction disruption from High Speed 2

The existing station is no longer considered to be fit for purpose and fails in many respects. It provides an extremely poor station environment with limited facilities for passengers and is regularly overcrowded. Accessibility to the station and connectivity across its site between the track, concourse and surrounding street network is far below the standard which would be expected of a nationally important rail terminus and interchange and moreover one that is likely to become the UK's largest transport hub. There is an opportunity to create a station that the country can be proud of.

Growth in passenger demand from the West Coast Mainline on its own supports the redevelopment of the Network Rail station. Increasing congestion within the station building will worsen the experience of passengers using the station still further and be detrimental to its role as a key 'gateway' to London. Despite its strategic importance to London's economy, there is a sense that Euston station has been left behind as other London termini (King's Cross and London Bridge) have benefitted from significant investment to increase capacity and improve the passenger environment.

High quality development is capable of being delivered above and around this station to make efficient use of this Central London location in a way which delivers clear benefits for Camden's residents and businesses. The Council has evidence which suggests that a level deck solution, where the tracks of the classic rail station are sunken alongside the High Speed 2 tracks, would maximise the benefits realised from a comprehensive scheme. It would facilitate additional and larger development plots within the station complex. The construction of a platform above the existing station is capable of accommodating significant levels of development without causing detrimental effects (e.g. on the designated viewing corridors).

Development at Euston is well placed to build on growing cluster of high tech and knowledge based industries and institutions in this part of Camden. Further expansion and growth of these knowledge industries is expected to occur over the next decade. This 'knowledge quarter' includes the British Library, University College London and University College Hospital. The construction of the Francis Crick Institute is nearing completion and organisations such as Google and the Alan Turing Institute for Big Data will be moving into this area. Euston station is also close to Camden Town and capable of supporting the growth and regeneration expected to occur there.

Camden Council asks that a recommendation is made by the National Infrastructure Commission to the Secretary of State for Transport and the Chancellor of the Exchequer to accelerate the process of bringing forward funding for the redevelopment of the Network Rail station so there is one integrated development of the station (i.e. NR and HS2) undertaken in the same timeframe, with Transport for London's plans for Crossrail 2 fully integrated into the scheme. We also suggest that Euston Station could form a case study for the Commission to consider in further detail.

Improve orbital routes and provide new rail connections

Since Transport for London took over responsibility for rail services on lines now comprising the Overground network ridership has increased markedly. The growth in ridership cannot be solely attributed to conventional elasticity factors such as increases in rail services levels and background growth factors associated with rising population and employment, but to other factors such as improved connections, marketing, information, wayfinding within stations, re-staffing of stations late at night and quality of rolling stock and improved performance (*London Overground Impact Study*, for Rail and Underground Panel, TfL, 16 November 2011).

The extension of the Gospel Oak Barking (GOB) line to Barking Riverside will also enable regeneration of this area and bring similar benefits as those set out above for Crossrail 2. Funding has been committed for the electrification of the GOB line and this is planned to be finished by 2017. The extension of the Northern line to Battersea will have similar benefits to the GOB extension.

The proposed 2 new Overground stations at Old Oak Common (at Old Oak Common Land and Hythe Road) will help transform this area into an important new transport hub, linking with High Speed 2 and Crossrail and the regeneration area there, although funding for these stations has not yet been fully identified.

In making improvements to orbital and other rail services in London particular consideration should be given to improvements that maximise the use of existing infrastructure (thereby giving good value for money), that involve new connections and as far as possible that can be made within existing rail lands so as to minimise objections and reduce costs. Examples include the West Coast Main Line to Crossrail link (which would extend Crossrail westwards making better use of the new Crossrail tunnels, and would facilitate the reorganisation of terminating rail services at Euston for the comprehensive development of that station as described above) and the four tracking of part of the West Anglian Main Line that recently became part of the Overground. These two examples are not yet fully funded and should be priorities for investment.

Major works at selected Underground stations

The growth of rail ridership on the Underground necessitates major works at certain Underground stations to increase capacity for passenger movements within these stations for a variety of purposes including improving operational safety and enabling enhancements to existing rail service levels. Examples of projects that are currently being investigated or seeking powers but are not yet fully funded include Holborn, Bank and Camden Town, and these should be priorities for investment.

The fully funded Northern line Extension to Battersea between the Charing Cross and Bank branches facilitates the separation of the Northern line; trains crossing one another to travel to different branches at Kennington and Camden Town reduces train frequencies so works at these stations ultimately enable greater capacity for the entire Northern line. Higher throughput of trains at Bank station on the Northern line threaten the operability of this station, hence the advance works being programmed for this station. The Northern line extension to Battersea includes the building of more cross-passenger tunnels at Kennington to facilitate interchange between the

branches of the line and it is imperative that funding is provided for this approach at Camden Town station for the same reason.

Step free access at rail stations

In recent years works that provide step free access from the street, through a station and onto platforms has been undertaken in numerous stations in London including Camden. This has opened up rail services to those with ambulant difficulties, bringing economic and social benefits. These benefits increase more than pro rata as additional stations are improved, widening the network of stations that can be used. This programme of improvements should be continued, with priority given to well-used stations and those stations that are important hubs within London's transport networks. For example, the Thameslink and Overground stations in West Hampstead are being made step free, so if the Underground station at this location were made step-free the benefits would be wider than those that would be attributed to this station alone - given the wider network that would accrue by passengers interchanging onto the other very nearby stations at this location.

Rail station improvements and relationships to the surrounding urban realm.

The provision of new rail lines or improvements to particular stations should not be looked at in isolation. The urban realm outside stations should also be improved to provide better interfaces with connecting modes and to land-use developments that will be encouraged by rail improvements. The integration of transport and land-use planning improves public transport ridership and regeneration potential creating a virtuous circle of change. For example, the Council has been working with partners to harness the benefits of the new Crossrail station at Tottenham Court Road through 'The West End Project'. This is intended to transform the public realm, improve movement through the area and boost business activity.

Improving cycling infrastructure

Currently Camden is making substantial additions and improvements to its cycling infrastructure. By the end of 2015, Camden has doubled the amount of segregated cycle lanes in the past two years and by the end of 2016 Camden plan to have over 10km of new and improved segregated cycle lanes in the borough linking many of the boroughs town centres to each other and to the West End and City. The rapid development of cycling facilities (whether segregated or not) is resulting in a marked growth in cycling – by 2% from 2014 to 2015 alone to bring the cycle market share to 13.6% borough-wide for daytime traffic flows. South of Euston Road cycling accounts for more than 23% of daytime traffic. This supports sustaining increased levels of investment in cycling infrastructure for all types of rider.

4. **Question 3 - What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?**

The comprehensive redevelopment of Euston Station would provide opportunities to reduce the cost of delivering the Euston-St Pancras Crossrail 2 station and increase the benefits of the proposed scheme. This would be unlocked through aligning the Crossrail 2 programme with the redevelopment of the classic Network Rail station at Euston, and a commitment to the funding of both projects. Uncertainty over the redevelopment of the current Network Rail station and lack of a comprehensive plan for Euston Station has resulted in the current proposals which would lead to the demolition of over 130 homes, 17 businesses and community facilities. The costs of acquiring this property and providing adequate compensation to landowners adds significant unnecessary cost to the project. The impact on residential property at Euston is greater than at any other proposed Crossrail 2 station.

Both the cost and impact on residents and businesses in the Euston Area could be significantly reduced by a comprehensive approach to the station encompassing High Speed 2, the redevelopment of the classic Network Rail classic station and any new Crossrail 2 station. This would allow for re-location of the proposed Crossrail 2 entrance to a site within Euston station, the opportunity to share worksites, speed up delivery and reduce land take. This would avoid the highly detrimental consequences of demolition in the area north of Grafton Way to allow for the construction of a new station entrance and box.

The Tottenham Court Road Crossrail 2 station is currently proposed to have a southern entrance in Shaftesbury Avenue and a northern entrance on Oxford Street at Rathbone Place – both wholly within Westminster. At this early stage of the project the details are under discussion, however the Council is seeking a northern exit on Tottenham Court Road itself as this would build on the regeneration benefits in this area which are starting to be realised through the West End Project and the increased capacity of the Northern and Central line ticket hall. Transport for London is aware of this possibility and is looking at options.

As part of its representation to Transport for London on Crossrail 2, the Council has highlighted the significant impacts on Camden residents living in close proximity to the proposed Rathbone Place entrance (in Westminster). It is likely that this entrance would become a major pedestrian trip generator and may not be the optimal location in terms of pedestrian wayfinding and connectivity to the wider area. For this reason and the potential adverse impacts of the construction works on Gresse Street residential property, we have asked TfL to fully investigate alternative sites.

References:

Euston Area Plan (adopted by Camden Council 2015)

<https://www.eustonareaplan.info/>

Euston Growth Strategy (November 2015)

<http://www.eustonareaplan.info/documents/> : under 'Other Documents'

Please see below a copy of LB Camden's submission to Crossrail 2 Growth Commission

CROSSRAIL 2 GROWTH COMMISSION: CALL FOR EVIDENCE

SUBMISSION BY LONDON BOROUGH OF CAMDEN

23.12.15

1. Introduction

If Crossrail 2 goes ahead, Camden will be the host borough to two Crossrail 2 stations at Euston St. Pancras and Tottenham Court Road. The London Borough of Camden therefore welcomes the opportunity to submit evidence to the Crossrail 2 Growth Commission. This submission covers:

- Overview of Camden's current position on Crossrail 2
- The need for a comprehensive approach at Euston encompassing HS2, Crossrail 2 and the Network Rail Stations
- The growth and regeneration benefits of the comprehensive approach
- Tottenham Court Road

Further detail can also be found in the London Borough of Camden's draft submission to TFL's current consultation on Crossrail 2.

2. Overview of Camden's position on Crossrail 2

Camden Council supports the principle of Crossrail 2 because of the benefits that it offers to Camden residents, businesses and institutions and to London as a whole. Through increasing capacity and connectivity, Crossrail 2 would support the conditions for continued economic growth, bringing vital jobs and business activity to the borough. By reducing congestion on current transport routes the scheme could mean faster and less crowded train and bus journeys for Camden's residents and visitors, and better access to employment opportunities. However, we are opposed to the current plans as written due to their impact on residents and businesses at Euston.

In total, the proposals would require the demolition of approximately 131 homes and 17 businesses. The impact on residential property at Euston is greater than at any other proposed Crossrail 2 station. A large proportion of this impact is unnecessary and could be avoided by re-locating the proposed Crossrail 2 station entrance to a site within Euston station. The demolition affecting the area north of Grafton Place, to allow for construction of a new station entrance and box and for some of the station tunnelling works, is a direct consequence of uncertainty over the redevelopment of the current Network Rail station as part of a comprehensive Euston Station Plan. This site contains 71 homes including 45 in the Council-owned Wellesley House. The resultant impact on residents and businesses is unacceptable and Camden Council cannot support the project in its current form.

However, in early December the Secretary of State for Transport provided a number of assurances to Camden linked to the HS2 Hybrid Bill proposals for Euston. These assurances, explored further below, provide an opportunity to revise the Crossrail 2 proposals and significantly reduce the impact on residents and businesses in the Euston area as well as to deliver a better transport solution. This can though only be unlocked by aligning the Cross Rail 2 programme with the redevelopment of the classic Network Rail station at Euston, and a commitment to funding of both projects.

3. The need for a comprehensive approach at Euston

The most significant barrier to delivery of additional growth at Euston is the risk of failing to comprehensively redevelop the existing Euston Station as an integral part of the delivery of the HS2 and Crossrail 2 stations. By coordinating projects there are opportunities to share worksites, speed up delivery, reduce land take and create a comprehensive redevelopment above an integrated jointly delivered transport interchange between HS2, commuter lines, the underground, buses and Crossrail 2.

LB Camden have been lobbying individually through the HS2 Select Committee process and through our Euston Strategic Board (a joint board with the Deputy Mayor of London, HS2, Network Rail and DfT) to secure funding to integrate the delivery of the projects, and in particular to secure funding to redevelop the existing station within a complementary timescale to the Crossrail 2 project.

LB Camden secured a number of assurances on this through the HS2 petitioning process, which include the setting up of a new Euston Station Strategic Redevelopment Board with members from LB Camden, GLA, TfL, Network Rail, DfT and HS2 which has a responsibility to integrate the delivery of the HS2 station, the redevelopment of Euston Station, Crossrail 2 and over site development and advises the Secretary of State for Transport. This is welcomed, but there is still currently no funding committed to redeveloping the existing Euston Station in the timescales required to prevent extra land take for Crossrail 2. As currently programmed a

preferred option for the design of a redeveloped classic station will not be known for a further two years which is out of sync with both the CR2 and the HS2 station design process.

LB Camden considers that the design of all the stations needs to be undertaken at the same time to enable the full potential growth and regeneration benefits and to deliver a world class station with high quality development above and around it. This provides the opportunity to integrate the Crossrail 2 station and remove the need for the demolition of as many homes and businesses. TfL have indicated that this could also be more effective in reducing passenger congestion on the Victoria Line and Northern Line, a key objective of the Euston Crossrail 2 station. Communities surrounding Euston are already set to endure 17 years of construction disruption arising from HS2. Integrated design of the Crossrail 2 works would provide the opportunity to co-ordinate works to minimise the severity and duration of construction impacts on already severely impacted local communities.

4. Growth and regeneration benefits of the comprehensive approach

The Euston Area Plan (EAP) is the opportunity area planning framework for Euston, jointly prepared and adopted by Camden Council, the GLA and TfL. It sets out the potential for transformational development and regeneration above and around the station and this envisages the delivery of between at least 2,800 and 3,800 new homes and 7,700 and 14,100 new jobs. The vision encompasses a high quality development with a world class transport interchange and reconnected communities to the north, south, east and west.

The Euston Growth Strategy, prepared by Camden Council, the GLA, TfL and Network Rail in close consultation with HS2, indicates that a comprehensive redevelopment of the station area alone could deliver up to 16,200 jobs and 2,200 homes which could in turn generate a development value of circa £3bn, an additional £1.1bn of GVA per annum and return approximately £1.3bn to the exchequer up to 2060.

The council has further evidence which suggests that a level deck solution for Euston station, where the tracks of the classic network rail station are sunken alongside the HS2 tracks, can provide even greater returns whilst significantly enhancing the regeneration potential in line with the objectives of the Euston Area Plan. This should be explored with the integration of the CR2 station at Euston.

The Euston Growth Strategy includes five recommendations:

- A commitment to comprehensive redevelopment at Euston

- Comprehensive master planning, design and engineering (including HS2, the classic station and Crossrail 2)
- Easing rail capacity to get Euston right
- Upfront funding for over-site development enabling works
- A local skills and employment strategy to get our people ready

The assurances provided to the Council by the secretary of state are a significant progression of the first two recommendations and further work with the partner organisations is currently ongoing to take this forward.

To allow for the design and reconstruction of the station while maximising operating flexibility, measures to ease capacity at Euston should be considered and implemented. The delivery of HS2 and Crossrail 2 are interlinked, as TfL predicts that onward passenger demand from HS2 (Phase 2) passengers arriving in Euston requires the delivery of Crossrail 2. Other measures, such as a link at Old Oak Common, from the West Coast Mainline to Crossrail 1 and other measures should also be considered.

Securing funding for a development deck and over-site development (OSD) enabling works across the whole station site, including any Crossrail elements will also be essential for achieving growth. So far funding is only in place for the OSD enabling works above the HS2 station.

Measures to ensure growth delivers real benefits for local people and businesses are essential to the success of any scheme. The growth strategy seeks the development of a local skills and employment strategy to get our people ready. As part of the HS2 assurances, the secretary of state has committed funding towards a construction skills and training centre at Euston, building on the model established at the King's Cross Construction Skills Centre. This will provide real opportunities for local people to access jobs in the construction industry. Given the scale of CR2 in Camden, we would ask that Crossrail 2 commit to funding and working with the Construction Skills Centre to support Londoners to access employment on these major infrastructure projects.

5. Tottenham Court Road

The Tottenham Court Road area is already undergoing substantial works, many of which are associated with Crossrail 1. The area is also located at the borough boundary between Camden and Westminster and is already densely developed and highly populated. The Council is concerned about the potential impacts on Camden residents living in close proximity to the site and the siting of the entrance at Rathbone Place, as raised in the Council's draft Crossrail 2 consultation response. There are also concerns about the impact of further

disruption on local businesses, which would need to be carefully managed and minimised. Any further opportunities for growth are likely to be more limited and dependent on the station option taken forward.

London Borough of Croydon Response to National Infrastructure Commission Call for Evidence

London's transport infrastructure

January 2016

Introduction

Thank you for the opportunity to provide evidence to the Commission on London's transport infrastructure needs.

Croydon is a member authority of the South London Partnership (SLP) and London Council's, both of which are responding to the Commission's current call for evidence. Transport for London (TfL) is the strategic transport body for the Capital, planning and managing London's, Underground / Overground, tram, bus and strategic road networks. TfL is undoubtedly (either itself or as part of a Greater London Authority (GLA) 'family' submission) providing evidence on London's transport needs.

Croydon's submission is not intended to repeat evidence provided by the above. Rather its purpose is to add emphasis and provide more detail on one element of transport infrastructure of key importance to Croydon and the wider region and one falling outside of TfL's direct remit, namely the Brighton Main Line (BML).

Major economic and social challenges facing London and its commuter hinterland

Within its evidence, the SLP highlighted the scale of transformation already underway, at Croydon's growth zone/Opportunity Area (focused on the Croydon Metropolitan Centre). Here, upwards of 23,500 new jobs and 8,300 new homes are to be delivered by 2031. The annual Gross Value Added equivalent of these jobs is estimated to be in order of £1.2 billion by 2031.

The SLP's evidence also highlights South London having the highest road-based mode share of any London sub-region, together with some of the slowest journey times. If the growth within Croydon and South London is to be sustainable then (as well as improvement to its strategic road connections), investment in infrastructure providing for alternatives to the car is critical.

Thirdly, the SLP's evidence highlights the scale of population growth forecast for South London with current projections at nearly 240,000 additional people by 2020 rising to over 400,000 by 2031 (equivalent to another Croydon). It contrasts this population growth with the predicted pattern of employment growth. The London Plan forecasts around 800,000 additional jobs but these are mainly located in . The GLA forecasts that South London is set to achieve only 40,000 additional jobs. The SLP emphasises the importance of creating more jobs locally in order to lessen the demands on already strained transport infrastructure.

In summary the major challenge facing London, Croydon and London's commuter hinterland is growth and maintaining or improving access whilst maintaining or improving environmental quality and quality of life.

Growth does not only pose challenges. It also offers opportunities. By providing thousands of new jobs, side by side with new homes and the range of service offered by the Croydon Opportunity Area, Croydon is providing for access with the minimum of travel.

Polycentric growth, such as that at the Croydon Opportunity Area, offers a wider range of benefits. Network Rail's London and South East Market Study

(<http://www.networkrail.co.uk/improvements/planning-policies-and-plans/long-term-planning-process/market-studies/london-and-south-east/>) predicts peak hour passenger demand on Thameslink and other fast services from Sussex (just some of the Sussex services to Central London on the BML via East Croydon) doubling between 2011 and 2043. This growth is largely predicted to arise from growing population outside of London accessing jobs in central London

Table 1 Peak hour passenger demand projections 2011 – 2043 taken from 'Long Term Planning Process: London and South East Market Study' Network Rail, October 2013

Route	Service group	2011 total	Forecast passengers in 2043	Increase 2011 to 2043
London Bridge	Thameslink & Sussex fast	15,200	27,900 – 31,400	91% – 115%
	Sussex stopping services	9,300	11,700 – 12,900	26% – 39%
Victoria	Sussex routes - fast services	12,100	14,700 – 16,200	22% – 34%
	Sussex routes - stopping services	12,900	16,500 – 18,600	27% – 44%

Network Rail's Sussex Route Study (www.networkrail.co.uk/long-term-planning-process/south-east-route-sussex-area-route-study/) highlights the busiest/most congested parts of the BML as the route from East Croydon to London Bridge and Victoria. By providing thousands of new jobs at the Croydon Opportunity Area, Croydon provides the opportunity for those living between Brighton and London to access jobs without riding on the most congested part of the BML. The growing job market in central Croydon also provides for increased 'counter commuting'. Those living in inner London are able to travel outwards to work in Croydon, greatly increasing the utilisation of the BML infrastructure. It also means that those currently traveling into the Croydon Opportunity Area by tram and bus etc. to interchange to rail for onward travel to work in central London, have the opportunity to work in Croydon and shorten their commute.

What are the strategic options for future investment in large scale transport infrastructure improvements in London

The BML is Croydon's rail spine. It is also Croydon's and London's connection to Gatwick and the wider Coast to Capital Local Enterprise Partnership zone. However, the BML is severely overcrowded, with passengers routinely standing from south of Haywards Heath in the peak. This can only be resolved through running more trains. Current passenger growth is running at least 4%

per annum. If no action is taken, crowding will increasingly extend further south, and occur across a longer part of the day, leading to more instances of passengers being physically unable to board trains.

The BML is also poorly performing, with Public Performance Measure (PPM) plateauing at around 90% for several years, before dropping off due to the London Bridge works. The core reason for the poor performance is the extensive operational interaction between the numerous different train service groups, due to the current complexity of configuration of the rail network. By means of comparison: routes from London Waterloo feature operationally simple grade separated junctions all the way out as far as Woking, whereas there are over a dozen major operational constraints in the Croydon area alone.

The current Thameslink works at London Bridge will provide more cross-London capacity, but this work does not address the key bottleneck on the BML which is in the Croydon area. Hence the full potential benefits of Thameslink are significantly constrained by capacity away from central London. Therefore, only a few additional trains will be possible from 2018 until such a time as this is addressed.

The Croydon bottleneck impacts on service performance across a wide area. From 2018 following completion of the Thameslink works, it will also impact on new routes north of London.

As well as quantifying the problem, Network Rail's Sussex Route Study also lays out the solution. Resolving the bottleneck in Croydon requires additional tracks and platforms in a relatively contained area at East Croydon and grade separation of the London Bridge and Victoria Lines just north at Windmill Bridge Junction. The benefits are very large in comparison with the geographical extent of the project.

In terms of interchanging passenger numbers, East Croydon Station is the fifth busiest in the country (behind Clapham Junction, Waterloo, Victoria, London Bridge) and busier than the recently rebuilt Birmingham New Street and Reading stations. It is also busier than Stratford (London), St. Pancras, King's Cross, Euston, Glasgow Central, Liverpool Street, Manchester Piccadilly and Leeds. In terms of total passenger entries, it is the 17th busiest station in the country. It is busier than the likes of Cannon Street, Edinburgh, Brighton, Gatwick Airport, Glasgow Queen Street, Reading, Marylebone and Liverpool Central stations (ORR Station Usage Estimates 2013/14). However, East Croydon station concourse is severely congested.

New development adjacent to East Croydon and across the Opportunity Area, mean that the station itself is now the "missing piece" in the wholesale transformation of the area. There is an opportunity for a major regenerative station rebuild scheme including railway improvements, housing, offices, retail and improved urban realm. The opportunity exists to upgrade the critical constraints on the BML. However doing this requires land outside the railway corridor in the rapidly developing central Croydon area. There is a major risk that the opportunity could be lost forever if not taken now.

The signalling equipment on the Brighton Main Line requires wholesale renewal in the early 2020s due to it reaching the end of its asset life. It will be far more efficient to upgrade the BML in combination with this signal renewal, rather than as a separate project.

Croydon and the wider SLP share a desire for a “London Overground” type transformation of train services in South London. This is not possible to achieve through management or operator changes. It requires the operationally critical infrastructure constraints in the Croydon area to be removed through a major infrastructure upgrade.

Conclusions

Growth presents both transport challenges and transport opportunities. Growth within the Croydon Opportunity Area means that many of those opportunities can be realised. However for the Croydon Opportunity Area to fully achieve its potential, and for growth in London and the Coast to Capital LEP zone to be sustainable, it is critical that the major bottlenecks on the BML be addressed. In order to ensure efficiency, it is vital that the investment take place at the same time as the planned signal renewal during the next Control Period. It is similarly the right time to complete the regeneration of East Croydon with a new 21st Century station at the same time additional track and platforms are being provided.

Andrew Adonis
Chairman of the National Infrastructure
Commission

Sent via email:
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Please reply to : [contact redacted]

E-mail :

Phone :

Your Ref :

Date : 8th January 2016

Dear Andrew,

Thank you for providing Enfield Council the opportunity to respond to the National Infrastructure Commission Call for Evidence on large-scale transport infrastructure improvements in London. We welcome this opportunity to respond on Crossrail 2 and the Council's wider aspirations for local growth linked to the project.

The Council strongly supports Crossrail 2 and believes it will provide the catalyst for transformational change in the Upper Lee Valley, unlocking the potential for thousands of new homes and jobs.

The Council has responded to both the Mayor's consultation and the Crossrail 2 Growth Commission call for evidence. It is understood submissions will inform the identification of further feasibility work needed to ensure plans for local development and the route are aligned.

The Council's response to the consultation questions is set out in the attached submission. Should you require any further clarification as to the Council's response, please contact Joanne Woodward, Head of Strategic Planning and Design on the details above.

Yours sincerely,



Rob Leak
CHIEF EXECUTIVE

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

1.1 Population growth across London and the South East is a major challenge for the area. Enfield's population has grown rapidly in the past decade and presently stands at 324,574 people and 129,000 households making it the fourth most populous borough in London. Projections suggest that by 2032 the population could rise to over 400,000 and the number of households to 169,000 (ONS 2012). This means we need approximately 1,900 new homes per year along with new schools, commercial uses and improved infrastructure, including significant transport investment.

1.2 These pressures for housing growth are not restricted to London and the Council has already received a request from one of its adjoining planning authorities concerning the potential for Enfield to accommodate some of its housing growth thereby increasing the pressure to find a sustainable solution to the need for new housing. More requests are expected as neighbouring authorities review their housing needs and available land supply.

1.3 The scale of the challenge means that a range of sources of supply of suitable land will be needed, including the intensification of existing urban areas and the need to consider land not currently identified for housing growth. Significant improvements to the rail infrastructure offered by Crossrail 2 will help unlock this potential.

1.4 The Council is taking a proactive approach to managing change and delivering growth in the borough. Its flagship regeneration project at Meridian Water is a £2 billion scheme set to deliver up to 8,000+ homes, a range of neighbourhood facilities and over 3,000 new jobs. The Meridian Water project alone will generate a £2.5 billion growth in GDP. Rail investment to the value of £70m which is already in place is a vital component of the infrastructure which supports Meridian Water. Indeed, without this investment, the regeneration of this nature and on this scale could not be taken forward. The Council is keen to work with the Crossrail 2 Commission to explore further the potential for growth in the borough arising from Crossrail 2, which will trigger further increases in housing capacity and associated economic benefits utilising the same principles which underpin the Meridian Water masterplan.

1.5 The West Anglia Routes Strategy Strategic Case submission by the London Stansted Cambridge Consortium (LSCC) (June 2015) states that on current trends the population of the LSCC area as a whole is forecast to grow by well over half a million people in the next fifteen years and another 210,000 jobs are expected - all of this before arrival of Crossrail 2. With GVA growth projected to significantly outpace job growth, the area will be contributing greatly to productivity growth. The Upper Lee Valley Opportunity Area is already a major employment zone, and the London Plan (2015) expects it to accommodate an additional 15,000 jobs, with potential for more if infrastructure

is improved further. Its potential for housing is even greater with the new revised London Plan coming forward in 2016, anticipating a minimum of more than 20,000 new homes, and it could be much higher with Crossrail 2.

1.6 Areas like the Upper Lee Valley have the greatest potential to grow Central London's labour supply, further serving dense and productive employment there as well as supporting employment areas such as Stansted outside of London. The potential for growth in the Upper Lee Valley has previously been recognised in the Mayor's Upper Lee Valley Opportunity Area Planning Framework (OAPF) 2013 and London Plan (2015).

1.7 Research by Oxford Economics, *Investment and Regeneration in the Lea Valley Corridor – Assessing the potential economic impacts for London and the UK* (2012) estimated that the Upper Lee Valley had the potential to generate £3.5bn+ of GDP if enhancements to rail infrastructure to provide four tracking and 8tph are provided along the West Anglia Main Line. Transport improvements already underway will help support growth and regeneration in the short term, but in the longer term these benefits would be substantially greater with a Crossrail 2 service of at least 12tph.

1.8 Tackling the borough's unemployment rate (7% compared to 6.6% for London as a whole) is another important objective for regeneration in Enfield. Building new homes in the borough on the scale needed but which are not connected to employment through rail infrastructure would not deliver our objectives for creating employment; stimulating economic growth and providing social equality. Similarly, the new employment opportunities planned as part of the regeneration of the area will not impact on unemployment in existing communities if transport infrastructure does not connect new employment to existing homes and communities in Enfield and beyond.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

- **How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?**
- **What might their potential impact be on employment, productivity and housing supply in London and the southeast?**

2.1 Given the higher frequency of public transport that the combination of rail enhancement projects will deliver, including Crossrail 2, the North East Enfield Corridor will become a prime location as part of wider connectivity networks in and out of London and the wider Upper Lea Valley and London-Stansted-Cambridge Corridor. Crossrail 2 will support significant numbers of jobs and housing along the line and provide general regional connectivity.

2.2 Enfield's plans for a new gateway station at Meridian Water (to replace Angel Road) mean that there will already be a modern, high quality station serving a major development site. In order to accommodate Crossrail 2, stations at Brimsdown, Enfield Lock and Ponders End will also all be upgraded. This will accommodate higher frequencies, with an additional 12 trains an hour being proposed. This increased capacity will unlock the long term potential of the areas served. The New Southgate area would also increase capacity with up to 15 trains per hour, vastly improving capacity and journey times.

2.3 The provision of a station at Alexandra Palace will also open up direct access to Crossrail 2 for the 13 million passengers (based on 2013/14 figures) in Haringey, Enfield and Hertfordshire who use the stations to the north. The interchange at this station will also relieve crowding at Finsbury Park station, which before wider Thameslink upgrades and development in the local area already has 28 million Underground users, 6 million national rail and a conservative estimate of 1 million interchanges per year. The station will also cover a wide area of north London and offer alternative travel opportunities to those using Piccadilly line services in Enfield, again reducing crowding on existing services and opening up development opportunities currently constrained by network capacity.

2.4 Given the higher frequency of public transport accessibility that the combination of rail enhancement projects will deliver, a number of new local town centres could be developed along the North East Enfield Corridor, focused around the new Crossrail 2 stations and serving both existing and new communities. Indicative masterplanning suggests that commercial and residential uses could be accommodated together creating lively and attractive environments.

2.5 These rail infrastructure improvements would have a significant impact on employment and productivity. Enfield is already one of London's most important business destinations, easily accessible to London's strategic road network and positioned within the London Stansted Cambridge Corridor (LSCC). The relative low cost and availability of commercial floor space and land has helped attract an enviable and diverse industrial base to the borough. Representing the second largest industrial location in the capital, the borough is home to almost 10,000 businesses providing nearly 100,000 jobs. Enfield's employment is expected to grow to 121,000 by 2036. The Council has aspirations to meet the needs of the growing population, working towards a target of 40,000 new jobs between 2010 and 2035, equating to approximately 5% of the forecast job growth for London as a whole.

2.6 Existing growth sectors include low carbon clean tech energy from waste, logistics, warehouse and distribution and professional, scientific and technical. The relative low cost and availability of commercial floor space and land has helped attract an enviable and diverse industrial base to the borough. Maximising employment opportunities for local residents and Londoners whilst accommodating housing growth will be a key challenge for the future and a key priority is to retain jobs and businesses in the borough and help them thrive.

2.7 Although UK and London industrial heritage is in decline as a result of changes to the UK's economic environment, there are a number of viable businesses being priced out of the more expensive areas of London. This creates an opportunity for the borough to promote its capacity to accommodate these businesses with their increased employment offer as part of a wider transformational change agenda.

2.8 Current assessments prepared by the Council's Meridian Water specialist advisors highlight Enfield's ability to provide better equipped and comparably cheaper B1 employment space within easy reach of Central London making it an attractive choice for expanding incubator, accelerator and co-working (IAC) companies. This is in contrast to inner London where there is an increasing lack of flexible and affordable workspace for expanding creative and knowledge-intensive companies.

2.9 Meridian Water is ideally located within the London-Stansted-Cambridge Corridor and can therefore capitalise on sectors associated with this region including life sciences and ICT. The Council has a clear and credible approach to identifying new employment uses which can meet the project aspirations of achieving 3,000 jobs in higher paid sectors. This will see a shift away from the traditional lower density industrial sectors located in the Upper Lee Valley. Meridian Water will bring in employment uses which are capable of paying a salary range from the London Living Wage to a minimum of £70,000.

2.10 The successful realisation of a shift towards higher quality business and residential uses in Meridian Water helps support the case for stopping rail

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SUBMISSION FROM ENFIELD COUNCIL 8TH JANUARY 2016*

services within the area by Crossrail 2. Such services would also form a strong catalyst for the realisation of higher value sectors employing an increasingly higher skilled workforce and benefitting from connections to Central London and the London-Stansted-Cambridge corridor and wider south east region.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

3.1 The Council is already working closely with Transport for London to consider the positive impacts Crossrail 2 might have on promoting housing, improving access to jobs and delivering sustainable places and meaningful regeneration. Utilising the 'Crossrail 2 Strategic Business Case' submission as a basis for future work, the Council suggests that alternative growth scenarios could be modelled to determine the optimum level of benefits from growth that Crossrail 2 could bring. This would benefit from further collaborative working in partnership with the GLA.

3.2 Imaginative use of land in Enfield across the South East, will unlock the potential of areas by maximising housing and employment growth and creating sustainable communities which support both economic and social objectives. However, the realisation of this potential is dependent on rail infrastructure. Crossrail 2 in Enfield could:

- Support the delivery of a significant number of new homes to meet a strong and increasing housing demand;
- Enable the transformation of predominantly low density employment areas into higher density mixed use communities;
- Provide a huge uplift in public transport accessibility, improve access to employment by reducing journey times to key destinations in the Central Area Zone and the LSCC and
- Enable four-tracking of the West Anglia Mainline to increase capacity.

Phased delivery

3.3 The benefits of phased delivery of Crossrail 2 can be realised by Government confirming funding for delivering solutions to level crossings and 4 tracking of the Lea Valley mainline at the earliest opportunity. This phased approach has a number of advantages:

- It demonstrates ongoing commitment, helping to build confidence amongst investors and the public;
- The funding profile is smoothed and therefore more manageable;
- Infrastructure provision is more closely matched with demand with less need for revenue support or excessive crowding; and
- Local skilled workers have ongoing opportunities for employment which avoids de-skilling and labour shortages.

Land use

3.4 There is a need to understand the constraints, opportunities and likely impacts associated with any redistribution of industrial floorspace through the

consolidation, intensification and densification of existing industrial estates in North East Enfield. It is also important to further test the cohabitation opportunities of commercial uses through exploring typologies for new industrial and mixed use employment space. Where market conditions are considered to be appropriate, the constraints, opportunities and likely impacts of alternative locations within the borough for some of the existing industrial floorspace could be also tested.

3.5 This work should include industrial sectoral analysis to review the potential for new sectors such as bio-tech, to form part of future demand for space around key stations in the North East Enfield Corridor. This will need to draw upon analysis sectors such as the life sciences sector for the London Stansted Cambridge Consortium; the Upper Lea Valley low carbon economy; property requirements and locations for the London knowledge economy; and employment land market.

Upper Lee Valley Branch – Eastern Enfield

3.6 At present on the West Anglia Main Line, local stopping services and faster services from Cambridge and Stansted Airport all compete for space on the same line. This limits the number of trains that can call at local stations and extends journey times to and from the area. Liverpool Street and Stratford stations also currently face severe capacity constraints. It is forecast that by 2043 demand for rail travel on this line will have increased by 39% - currently there is no spare capacity for additional services.

3.7 Crossrail 2 provides a solution; it would free up capacity on the West Anglia Main Line helping to reduce journey times for longer distance services and would enable more local services to central London. Transport improvements already underway will help offset the pressure in the short term. But Crossrail 2 is needed to cope with longer term growth.

3.8 Enfield's plans for a new gateway station at Meridian Water (to replace Angel Road) mean that there will already be a modern, high quality station with step free access serving a major development site. Alongside this it is positive that in order to accommodate Crossrail 2, the stations at Brimsdown, Enfield Lock and Ponders End will be upgraded to higher standards, including making them step free. Further discussions will be necessary to agree the details of the upgrades, as well as the possible re-configuration/relocation of some stations to improve passenger access.

3.9 The Council strongly supports increased frequencies at all of these stations, with the additional minimum 12 trains per hour service proposed in the consultation, being a level which will unlock the long term potential of the areas served. It would create capacity for two additional local stopping trains per hour to Stratford and much improved connections to Stansted Airport and Cambridge. Conservative estimates are for Crossrail 2 to unlock 70,000 homes

and 27,000 jobs along the Upper Lee Valley, including at our key regeneration site of Meridian Water together with the wider and longer term opportunities for additional growth in the North East Enfield Corridor.

3.10 It is recognised that level crossings will have to close at Enfield Lock and Brimsdown and alternative solutions assessed to mitigate impacts on east-west transport connectivity, road safety and rail network reliability. The Council, along with stakeholders from along the West Anglia rail route, strongly supports this happening before 2024. However this is on the proviso that mitigation is put in place which improves transport network connectivity, with a particular focus on accommodating bus services and people who choose to walk and cycle, while causing the least disruption to residents in the area around them.

New Southgate Proposals

3.11 The Council welcomes the benefits which Crossrail 2 could deliver in the New Southgate area. The New Southgate proposals will provide up to 15 trains per hour via Seven Sisters; vastly improving capacity and journey opportunities. However this is a drop from 20 trains per hour and the Council would welcome discussion on the rationale behind this. Previously it was the case that 20 trains per hour was the minimum required to make the New Southgate branch viable. Given recent experience, the Council would like to see an early commitment from Network Rail and Transport for London to minimum levels of service, so that these can be factored into our discussions with development partners.

3.12 New Southgate station provides local employment opportunities at the adjacent Crossrail 2 train stabling and maintenance facility, while reduced journey times - only 21 minutes to Victoria - bring 410,000 more jobs within a 45 minute journey. These opportunities will be accessed via step-free stations which have capacity for 2,000 more passengers per day in the morning peak hour.

3.13 Overall the New Southgate branch provides direct access to Crossrail 2 for a large area of north London and unlocks potential for significant regeneration and redevelopment.

Alexandra Palace

3.14 The provision of a station at Alexandra Palace will open up direct access to Crossrail 2 for the 13 million passengers (based on 2013/14 figures) in Haringey, Enfield and Hertfordshire who use stations to the north. By providing an interchange further to the north for suburban rail passengers, there will also be crowding reduction benefits on both the Piccadilly and Victoria Underground lines; one of the core objectives for Crossrail 2.

3.15 Alexandra Palace interchange will also relieve crowding at Finsbury Park station, which before wider Thameslink upgrades and development in the local

area already has 28 million Underground users, 6 million National Rail and a conservative estimate of 1 million interchanges per year.

3.16 The station at Alexandra Palace will also cover a wide area of north London and offer alternative travel opportunities for those using Piccadilly Line services at Bounds Green and Wood Green, which again reduces crowding on existing services and opens up development opportunities currently constrained by network capacity. The Council's support for the benefits of the Alexandra Palace route alignment and the potential for growth it could have outside of London is shared by local authorities along the route north of London – including Hertfordshire County Council, Stevenage, East Herts, Welwyn and Hatfield Councils. The Council would welcome further discussion led by the Crossrail 2 Commission to debate the route options.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

- **What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?**
- **What innovative funding mechanisms could be considered to support delivery of key schemes?**

4.1 An independent report for Crossrail 2 produced by PricewaterhouseCooper (PwC) (2014) sets out options into how Crossrail 2 could be funded. It shows that over half of the costs of the scheme could be met by London using existing funding mechanisms. Enfield Council supports this and is prepared to play it's part.

4.2 The Council's vision is for phased investment in the transport network in the Upper Lee Valley, which has the following advantages:

- It demonstrates ongoing commitment, helping to build confidence amongst investors and the public;
- The funding profile is smoothed and therefore more manageable;
- Infrastructure provision is more closely matched with demand with less need for revenue support or excessive crowding; and
- Local skilled workers have ongoing opportunities for employment which avoids de-skilling and labour shortages.

4.3 The development at Meridian Water is expected to lever in significant investment into Enfield and unlock the financial potential of the area. The Council will work closely with its partners to support investment and job creation across a number of sectors in Meridian Water, particularly in the Meridian East area. Beyond the use of its planning powers, the Council is looking at opportunities to encourage investment in these areas, reducing regulatory and financial burdens wherever it can, bidding for joint funding wherever appropriate and leveraging in assistance from partner organisations and groups. In order to drive the local economy forward and create jobs for new and existing communities, Meridian Water presents an opportunity to expand on the existing area's assets. There is a significant opportunity to expand, upgrade, regenerate and/ or intensify existing facilities in the area.

4.4 Meridian Water is one of London's Housing Zones. The Housing Zone funding is already providing major station upgrades, including Funding for the upgrade of Meridian Water Station (formerly Angel Road); new road infrastructure and bridges.

*NATIONAL INFRASTRUCTURE COMMISSION – CALL FOR EVIDENCE
SUBMISSION FROM ENFIELD COUNCIL 8TH JANUARY 2016*

4.5 The Council is driving forward the development of Meridian Water through land purchase and pump priming transport infrastructure, including funding new bus routes. With additional funding streams in order to pump prime infrastructure on a larger scale, and in order to purchase land on the route in advance of development, the local authority would have the ability to capture the land uplift.

4.6 The Council is programming to have its planning framework in place by 2017/18, aligned with the programme for the Mayor's New London Plan and Upper Lee Valley Opportunity Area Planning Framework to capture growth generated through Crossrail 2 in order to exercise its Compulsory Purchase Order (CPO) Powers. Given the optimal timeline to seek parliamentary powers for permission to build and operate Crossrail 2 would be between 2017- 2020, the Council's land assembly strategy would need to commence in 2016 before certainty for Crossrail 2 project delivery is confirmed to assemble land at current use value.

4.7 The Council plans to carry out an early comprehensive assessment of current land values to inform the land assembly strategy, which will then be used to capture increases and recoup some of the uplift. Initial assembly would be through negotiated purchase but given the complex nature of land ownerships in the North East Enfield Corridor, the Council would need to exercise its CPO powers.

4.8 In the process of optimising land use we need to redesign infrastructure to ensure sustainable delivery on the scale required. This is likely to lead to profound changes which will impact on business rates during the period of change as some industrial estates are relocated and others come on stream. We will need a mechanism that can award a 'zonal status' on the areas affected to ensure that the loss of business rates does not impact the process. Transitional support to local authorities would need to be made available to ensure the success of transformation. Consideration also needs to be given to premium revenue streams being identified to offset the CR2 costs.

NATIONAL INFRASTRUCTURE COMMISSION CALL FOR EVIDENCE

RESPONSE FROM THE LONDON BOROUGH OF HACKNEY

1. WHAT ARE THE MAJOR ECONOMIC AND SOCIAL CHALLENGES FACING LONDON AND ITS COMMUTER HINTERLAND OVER THE NEXT TWO OR THREE DECADES?

London's population is rising rapidly, a predicted increase to 10 million people by the early 2030s is now being seen as a conservative estimate. Research by consultancy Atkins, in partnership with Oxford Economics and the Centre for London, claims London's population will actually become home to 12 million people by 2050, surpassing even the GLA estimate of 11.3 million. It also claims that there will be 6.3m workers by 2026 rather than 2050 as currently estimated.

London's overall employment growth is to a large part driven by its role as a leading world class city. The largest density of high value activities associated with this reputation are primarily located within inner London, an area defined as the Central Activities Zone of which Hackney forms a part. This area hosts over 30 per cent of London's jobs.

London's continued economic growth will, alongside demographic factors, drive an increase in population numbers. Current GLA forecasts show Hackney's population alone is predicted to increase by between 100-150,000 between 2011 and 2050.

Unless the supply of housing, new employment space and infrastructure is increased across the capital in line with population growth and the predictions of growth are used to anticipate both the investment and delivery of infrastructure, London's economy will falter.

While rail provides the main backbone of the transport system, London's buses tend to provide local links and with an affordable fare system. However, the streets are increasingly having to cater for higher volumes of pedestrians and cyclists and for servicing and freight logistic requirements as population densities increase.

To cope with the increase in population and economic activity London's current infrastructure must continue to expand to cater for additional demand. From utilities, particularly water and electricity, to Local Government and local public services such as Education, Health and Social Care provision. All will need to receive adequate revenue and capital investment from both public and private sources to keep pace with demand and maintain London's competitiveness.

2 WHAT ARE THE STRATEGIC OPTIONS FOR FUTURE INVESTMENT IN LARGE-SCALE TRANSPORT INFRASTRUCTURE IMPROVEMENTS IN LONDON – ON ROAD, RAIL, AND UNDERGROUND – INCLUDING, BUT NOT LIMITED TO CROSSRAIL 2?

- **How should they be prioritised, taking account of their response to London’s strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?**
- **What might their potential be on employment, productivity and housing supply in London and the SE?**

The Council would suggest that the infrastructure requirements needed are outlined in the Mayor of London’s Infrastructure Plan 2050 and subsequent updates. We would specifically refer to the following as relevant to Hackney:

CROSSRAIL 2

Crossrail 2 is needed to address capacity constraints that will exist on the London Overground and Underground. It will allow up to 270,000 more people to travel into central London during the weekday morning peak period. This scheme is seen as a priority.

The Case for an eastern alignment on the route

However, although Crossrail 2 will improve public transport connectivity to and from Dalston the Council considers that an additional eastern alignment would cater for further growth in Hackney Central and Hackney Wick before heading east to Essex via Newham and Barking & Dagenham.

When this option was first examined we note that the original projections from September 2012 indicated an increase in population of 101,000 and 85,000 additional jobs associated with it.

Significantly since those figures population growth projections for London have been revised upwards with population growths of 30% now forecast in Hackney and Barking alone by 2041 and 50% in Newham for the same period. Thus there will be an expectation of greater population growth along the route on the eastern branch in the order of 330,000 in those 3 Boroughs alone. On job increases these are forecast to rise by 150,000 in Tower Hamlets (mainly around Canara Wharf), 20,000 in Hackney and 70,000 in Newham, again by 2041. This points very much to the idea of the eastern branch having primarily a strong regeneration case and would greatly strengthen the need and business case for the railway.

The LLDC is on target to build 24,000 new homes by 2031 and is already delivering in excess of the London Plan housing target of 1,471 homes per annum. Enhanced connectivity has the potential to increase these figures considerably.

The proposed Crossrail 2 alignments to the northern route have also been promoted as they would relieve overcrowding on both the Victoria and Piccadilly lines. These lines have planned capacity increases of 9% and 60% respectively yet the Crowding Map for 2041 shows little overcrowding on the Piccadilly line north of Manor House.

Proposals for the routing of the eastern branch have indicated two potential alignments towards Stratford. One of these alignments suggests the possibility of an underground Crossrail 2 station at Hackney Wick. The Council commissioned consultants to prepare a report on the feasibility and business case for such a station. The report suggested that the amount of developable land within a 12 minute catchment could deliver associated regeneration benefits in the order of £1.4 billion, well in excess of the benefits necessary to justify a new station.

Accordingly, in any further work on the eastern branch Hackney would seek to have a station at Hackney Wick that would afford a level of relief on the already congested London Overground and also assist in relieving the crowding scenario forecast for 2041. A station in the Hackney Wick area would also unlock growth opportunities in the NW part of the LLDC area which has been identified in their Local Plan to 2031 as having the weakest public transport links.

A future station at Stratford

Currently Crossrail 2 are considering two potential alignments through the Stratford and Olympic Park area for the eastern branch. This consists of a southern alignment with a station at Fish Island and Stratford Regional and northern alignment with a station at Hackney Wick and north of the International Station at Stratford.

The International Quarter at Stratford will accommodate 25000 people. Here East, a new creative and digital hub is expanding to provide jobs in the media, creative and cultural industries. In addition the 2014 Employment Land Review estimates that employment growth in the LDDC area will provide an additional 44,700 to 47,000 jobs by 2031.

Both Hackney and Newham Councils consider the northern alignment to offer the best long term solution for the Queen Elizabeth Olympic Park, Hackney Wick, Stratford City, Stratford Regional Station and the High Speed Kent lines. This would provide a well served national and potentially international high speed, light and heavy rail interchange facility. This option is preferred as it would:

- Link up the International Station with the High Speed Kent services, the DLR and Overground providing relief to Stratford Regional Station and the southern entrance to Westfield Stratford as well as directly serve any forthcoming developments there such as the emerging Stratford City office quarter and the completion of the Olympic & Paralympic Legacy project.
- Relieve the 2041 crowding scenario identified at Stratford Regional on both the Central line and the new Crossrail 1 corridors and would make use of spare capacity on the Jubilee line to serve Canary Wharf.

In addition to locating a Crossrail 2 station north of the CTRL box, the development of a surface station at High Meads loop in close proximity to the International and DLR station would further enhance the hub arrangement. Such a station could allow Lea Valley Line services to utilise the loop at Stratford and provide additional platform capacity for Lea

Valley Line services and provide additional resilience for the Overground when congestion occurs.

Finally a further benefit of developing an additional interchange station at this location would result in higher PTAL levels and a corresponding increase in development values thus freeing areas currently inefficiently devoted to parking.

In order to promote the case for an eastern alignment we have collaborated with the London Boroughs of Newham and Barking & Dagenham, together with Essex County Council to commission a study into a possible eastern option.

Barking & Dagenham have ambitious plans already underway, to position Barking as a place to accelerate the areas growth potential and encouraging inward investment to build new homes and create new jobs. A number of key sites have been identified in and around Barking town centre which have the potential to unlock further growth together with developments further east at Beam Park in close proximity to the C2C line. A direct rail link between Barking town centre and the Stratford rail hub, which an eastern route for Crossrail 2 could provide, is a key infrastructure requirement.

The Study is expected to report in mid-February, and we would be happy to share any recommendations and conclusions from the study.

Continue to improve the London Overground Network

The expansion of the London Overground Network has been a success story with large increases in passenger numbers being accommodated with longer trains. More frequency increases and improvements are planned and the transfer of services to TfL has witnessed a transformation in the quality of the service as well as improvements to stations.

However, further growth in the coming decades will result in severe overcrowding on some sections of the E-W route between Stratford and Highbury & Islington, the line serves Dalston Kingsland, Hackney Central, Homerton and Hackney Wick.

London has seen the benefits of improved interchanges such as the one at Hackney Central/Hackney Downs which has already exceeded its first year target for patronage. The effect of this has, however, put pressure on the existing Hackney Central station which together with Dalston Kingsland, Homerton and Hackney Wick will need complete reconstruction to be able to cope with future increases in demand.

We note that TfL are about to submit plans to provide short term improvements to Hackney Central. Although these are welcome they are barely proposing to keep pace with existing demand let alone future demand.

On the N-S routes, recently taken over by TfL we note that the stations are characterised by poor or outdated infrastructure and we would also wish to see these brought up to standard alongside enhanced services.

Demand for rail travel in east London and north east London along the Lea Valley Corridor is expected to grow heavily in the next decade. Hackney Council is a member of the West

Anglia Routes Group which is working with TfL and Network Rail to seek a commitment to address ongoing constraints arising from having Lea Valley services better suited to a four track mainline currently operating on a two track railway.

Although three tracking is currently planned it is important that further improvements are initiated able to lead to more frequent services along the Liverpool Street to Cambridge corridor.

Continued investment on the Tube network

Whilst we acknowledge that there are no Underground stations in Hackney we nevertheless support continued improvements to the Underground network backed by investment into new rolling stock, signalling and capacity improvements.

We would suggest that the Waterloo & City Line be given priority for investment with walk through trains to enable more passengers to be carried as an early win in advance of Crossrail 2 opening. This line provides a strategic fast connecting link between north and south London. For Hackney this is via the Central Line which serves the area around Liverpool Street and Bethnal Green, both stations close to Hackney's borough boundary.

Improvements to the bus network

Although bus services are of a more local importance we would suggest that their continued improvement is as equally important in social and economic terms. A high quality affordable, reliable and efficient bus network is essential to a prosperous capital city.

Many workers rely on buses to commute at all times of night and day. Buses are also a lifeline for an increasing elderly population who rely on them to improve their mobility.

Buses are also a relatively cheap form of public transport able to swiftly provide new residential or employment areas with improved accessibility levels. Capital investment will be needed for both the bus fleet and bus priority measures to continue to ensure a reliable and efficient bus network has priority on the capital's streets.

Cycling and Walking

We fully support local transport modes and call for Cycling and Walking to be seen as part of the UK's transport national infrastructure programme.

Hackney's Transport Strategy is seeking a cycling modal share of target (for all journeys) of 20% in 2031. A continued investment into key cycling routes, contra-flow cycling measures and safety improvements at key junctions are the type of capital interventions required.

The Council strongly supports walking as an active travel mode and to this end has identified and will continue to identify areas where public realm improvements can bring improvements to promote this mode of travel. A growing population will demand an increasing focus on improving walking and cycling infrastructure within the capital.

3. WHAT OPPORTUNITIES ARE THERE TO INCREASE THE BENEFITS AND REDUCE THE COSTS OF THE PROPOSED CROSSRAIL 2 SCHEME

A significant step has already been taken to increase the benefits by opting for the 'regional' rather than the 'metro' route to maximise access to areas where growth is envisaged.

However, further benefits could be achieved for and by the scheme if the option to unlock the potential additional growth in the east is embraced.

Further analysis is required to define the benefits and quantify the reduction in cost to the scheme and we would support the call for this work to be initiated.

The Council would also suggest that opportunities to enter into joint ventures between public and private organisations be explored. The aim to achieve greater value for the scheme and provide a return on public and private assets in addition to socio-economic outcomes.

4. WHAT ARE THE OPTIONS FOR THE FUNDING, FINANCING AND DELIVERY OF LARGE-SCALE TRANSPORT INFRASTRUCTURE IMPROVEMENTS IN LONDON, INCLUDING CROSSRAIL 2?

- **What is an appropriate local and regional contribution – given the potential distribution of benefits to businesses, residents, transport users and the wider economy – and how could this be achieved?**
- **What innovative funding mechanisms could be considered to support delivery of key schemes?**

As has been stated by London Councils in their submission we acknowledge that London Boroughs will need to contribute to the funding for Crossrail 2 and to this end support proposals for London as a whole to contribute up to half the cost. As the beneficiaries will be residents and businesses it is appropriate that there are contributions from both.

We have looked at the suggestions in the PWC report for a delayed start to the project but feel that the urgency is such that the start needs if anything, to be brought forward.

Residents and businesses outside London who are connected to the route and receive the benefits of Crossrail 2 should also contribute in the same way that London's residents and businesses will contribute.

8 January 2016

Dear Sirs

National Infrastructure Commission – Call for Evidence

The NIC published its call for evidence on 30 October 2015. The Terms of reference cover

1. Future investment in the North's transport Infrastructure
2. London's transport infrastructure
3. Delivering future proof energy infrastructure.

This response from the London Borough of Haringey is in relation to London's Transport Infrastructure.

London Borough of Haringey – context:

Located in North London, Haringey is one of London's 32 London Boroughs. With a population of circa 270,000 the borough has both significant pockets of wealth, and towards the eastern edges with the Lea Valley regional park, some of London's and the Country's most deprived (as measured by the indices of deprivation) communities. Northumberland Park Ward, in North Tottenham is the 2nd most deprived community in London and the 120th most deprived in England out of 7,669.

Haringey is a borough that has been identified for significant housing and employment growth. The further alteration to the London Plan 2015 increased Haringey's annual housing target by 80% (from 832 new homes p.a. to 1502) and the borough has the highest employment growth target (as a percentage) in London. Over the last 3 years, as a result of the changes to government funding, the Council's budget has shrunk by £117m .

Haringey has well advanced plans to support London and the Country's growth requirements. Alongside an adopted and up to date Local Plan, the Council is now engaged in the production of 5 development plan documents, allocating Brownfield sites across the Borough for 20,000 new homes and planning to secure 12,000 new jobs. The adopted Local plan identifies Tottenham and Wood Green as the focus for future growth. Work on Area Action Plans for Tottenham and Wood Green is progressing. Around £1bn of public and private sector investment has been made in Tottenham.

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The Council fully supports the proposals for Crossrail 2 and is working constructively with Transport for London and Network Rail officers to secure effective planning and to ensure that the opportunities to support growth and economic improvement from the new stations and greater accessibility provided by the project can be fully realised. Within Haringey, Crossrail 2 will provide up to 5 new stations, connecting the two principal growth locations of Tottenham and Wood Green to London and the wider south east – including Stansted Airport and Cambridge to the North.

What are the major economic and social challenges facing London and its commuter Hinterland over the next two to three decades?

There is growing evidence that demand for housing in London and the wider south east is impacting upon the economic performance of the region. Affordability and the rising numbers in housing poverty mean that measures to increase the supply of affordable homes for Londoners are now a matter of national importance if the productivity and economic contribution that London (and its boroughs) can make to the country is to be sustained. If growing pressure on the use of land (including the recycling of former employment space for new housing) is not to impact London's capacity to contribute to the country's economic outputs, improving access to work and employment opportunities across economic areas will be of increasing importance. Within Haringey, some 84% of people travel outside of the Borough each day to work. Around 23% of residents work in central London. Public transport use in the Borough is high with almost one third of journeys by public transport. Private car ownership fell between 2001 and 2011 and continues to fall as a percentage of the population. The key transport corridors nevertheless remain air quality management areas as a consequence of unacceptable levels of pollutants derived from road traffic.

The Borough's population has also increased by around 17% between 2001 and 2011 and continues to rise. Over the same period housing stock rose by 11%. Meanwhile, some 3.5 ha of employment land has been recycled for housing.

For Haringey's economically deprived communities, raising household incomes by supporting access to new employment and work opportunities is central to improving not only the health outcomes and the quality of life but also in reducing the costs to the public sector arising from the necessary support to address the consequences of deprivation. Affordable and effective transport options with sufficient capacity to connect these existing and growing communities with the opportunities that London represents one of the key interventions that government can make to reverse the long term decline that these areas have suffered.

The evidence from Crossrail 1 demonstrates also the significant impact upon market and developer confidence that public investment at scale can have. Locations on the Crossrail route have experienced significant increases in development activity in recent years and have made a significant contribution towards meeting London's growing housing and employment land requirements. Within Haringey, the proposed Crossrail2 stations align with the Local Plan's growth locations (and reinforce a planned spatial growth option that underpins the economic performance of key existing areas (such as Wood Green Metropolitan Town Centre) whilst providing an important catalyst for regeneration and renewal in key parts of Tottenham (notably Tottenham Hale and Northumberland Park.

These areas, notwithstanding the Council and GLA investment to date, continue to exhibit challenges – whether in respect of development viability (because of development values and significant costs) or because of investor confidence.

What are the strategic options for future investment in large scale transport infrastructure improvements in London, on road, rail and underground – including but not limited to Crossrail 2?

Haringey Council consider that because of the significant positive impacts that are considered to flow from Crossrail 2, this strategic project should be afforded significant priority within government and the GLA. The Council has received significant positive feedback from the development industry concerning the prospects for delivery arising from the identification of the Crossrail 2 station sites within Haringey. The opportunity that CR2 represents to enable sustainable higher density development in Haringey is unmatched by any other form of strategic transport investment.

Given the significant role that the North Circular Road plays in accessing opportunities in outer London, the current capacity constraints and associated environmental effects that exist on the North Circular road, at locations such as Pinkham Way in Haringey also justify further strategic transport investment by government. North London is poorly served by orbital rail and opportunities for enabling greater movement between outer London Boroughs is constrained by existing network capacity. As London's population grows, and pressure on "affordable" business premises grows in more central sites (where the contrast between residential and commercial (industrial uses) is greatest, the pressure on orbital routes (by road and rail) can be expected to increase. If this growth in outer London trips is to be accommodated further investment is considered appropriate in existing key infrastructure such as the NCR to respond to both environmental as well as localised capacity and safety issues.

Following the successful investment in the Victoria Line and with the advent of the Night Tube, continued investment in underground rail is also a priority. The Piccadilly Line (running thorough the Borough) connects the metropolitan centre of Wood Green and its hinterland with the rest of London. However, investment in new rolling stock, and track/signalling is required to ensure that the capacity of this key corridor can be maximised.

What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

The Council has responded to the consultation on Crossrail 2 to support a single station option at Wood Green in place of the former 2 station strategy. The Council's position is based upon clear economic and strategic reasons but also recognises the financial benefits of this solution. Focusing the regenerative opportunities of Crossrail 2 into the heart of the Metropolitan centre of Wood Green will also, in the Council's view, maximise the benefits that can be realised from the investment proposed.

Haringey Council also considers that the long delivery times associated with Crossrail 2 means that TfL should fully explore the use of all of the land identified for both construction and delivery of the project. This includes developing a strategy to enable

positive “meanwhile use” of worksites and safeguarded land and to work with boroughs on long term solutions for worksite and over station development opportunities post implementation.

What are the options for funding, financing and delivery of large scale transport infrastructure improvements in London, including Crossrail 2?

The delivery of large scale transport infrastructure in London benefits the whole of London and the wider south east. The evidence that the Borough is presented with from developers seeking to bring forward new development in the Borough is that infrastructure costs play an important part in the delivery of new development – and directly impacts upon the achievement of important affordable housing and employment space outcomes through mixed use developments – particularly in more marginal areas of the Borough (which are in need of the investment most). Given the very broad spread of benefits from such infrastructure, the costs of delivery should be appropriately shared – and certainly should not land disproportionately on specific boroughs. Investment in rail infrastructure is of benefit not only to rail users and those located in the immediate vicinity, but also to those businesses and residents located some distance from stations. Funding for Crossrail under the existing CIL, represents a simple and transparent means by which contributions can be made towards delivery. The “infrastructure” for administration and delivery is also well established and understood. The Council would urge the commission to carefully consider the implications for any other funding regime that might be considered – and balance the costs of collection and enforcement against any potential benefit.

How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

The Council has no specific insight or views on what transferrable lessons might be derived from a study of other transport infrastructure projects. It nevertheless notes that public sector investment in strategic transport is central to unlocking growth in mature and growing cities across Europe and considers this investment to be a key part of the role of government in promoting sustainable development in line with the NPPF.

National Infrastructure Commission Evidence on Infrastructure Improvements in London

London Borough of Waltham Forest Proposal for a Crossrail 2 Line

Waltham Forest Council supports in principle introducing major new public transport infrastructure to accommodate an increase in London's population from 8.6 million today to a predicted 10 million by 2030. The Crossrail 2 scheme on its safeguarded alignment would provide significant additional public transport capacity to the north east sub region of London. The current proposals for connections towards Broxbourne and New Southgate would facilitate development in the boroughs of Hackney, Haringey and Enfield. However, the current safeguarded scheme does not connect eastwards to Waltham Forest, meaning that the borough will derive limited benefit from the scheme.

The current scheme does indicate the possibility of a future eastern spur but no information on the alignment of this is currently indicated. Waltham Forest Council considers that an eastern spur should be an essential element of the Crossrail 2 scheme from the outset. The Council would welcome the opportunity to explore the detailed alignment of this spur with stakeholders and delivery partners to ensure the borough has sufficient transport infrastructure in place to accommodate continued economic and housing growth.

In terms of the strategic role of Crossrail 2, the Council supports the key objective of accommodating housing growth and regeneration and also considers that the scheme has an important function in terms of relieving congestion on existing underground and suburban rail network. A scheme introduced on the safeguarded route would substantially reduce overcrowding on the Piccadilly and Victoria lines and on the West Anglia rail routes to East Hertfordshire and West Essex.

A potential eastern spur of Crossrail 2 would perform a similar dual function: regeneration and congestion relief. An eastern branch would help relieve congestion on the Central line which would otherwise be expected to become critical all the way from central London to Leytonstone. Latest Transport for London modelling suggests that between four and five passengers per square metre will be forced to stand by 2041 from Leytonstone with existing committed schemes in place.

With regard to the relocation of certain types of land use, such as employment land and open space, Waltham Forest Council seeks to retain these where possible, particularly employment land as this is in short supply in the borough. However, we recognise that there is a case for redesignation of land for housing-led development around public transport nodes where it is possible to implement high density residential development, in turn contributing to the cost of delivering transport infrastructure improvements. The Council has identified a number of such opportunities and is already delivering significant housing growth through the delivery of GLA Housing Zones in the west of the borough.

Work carried out for the development of TfL's North London Sub Regional Transport Plan shows that Waltham Forest has seen a higher population growth in recent years than neighbouring areas. Indeed, research carried out by the Council indicates that the actual population in the southern part of Waltham Forest is considerably higher than that indicated

by the census. This population growth is expected to continue over the next 20 years as the borough is both a desirable place to live and, relative to inner London, provides a greater range of accommodation that is more reasonably priced.

The borough has an ambitious target to deliver 12,000 new homes in the next five years, the majority these being in the southern half of the borough (the area that would benefit from a connection to Crossrail 2) with further growth planned for the following decades. There is scope for several thousand new homes in the Leyton area on a number of major development sites such as Leyton Mills Retail Park, along Orient Way and a possible scheme to deck over the A12 at Leyton/Leytonstone Central Line Stations which is being developed by Transport for London.

In recent years, Waltham Forest Council has worked with a range of strategic stakeholders and delivery partners to secure significant investment for the development and infrastructure at Queen Elizabeth Olympic Park which sits to the south of the borough; on the business case and delivery plan for Lea Bridge Station which will open in May 2016; and the introduction of network improvements and investment in transport infrastructure across east London's Overground network. On the basis of this track-record, the Council is extremely keen to work with partners to develop plans for an eastern spur of Crossrail 2 that facilitates further growth and capacity improvements in the borough and the east London sub-region as a whole.

Wandsworth Council's submission to the Crossrail 2 Growth Commission's call for evidence

December 2015

Contact – Jon Evans, Head of Policy and Communications, jevans1@wandsworth.gov.uk, 020 8871 7815

Question	Wandsworth Council's response
<u>The strategic role of Crossrail 2</u>	
<ul style="list-style-type: none"> Do you agree with the analysis of national/ regional economic trends which are integral to Crossrail 2's business case? 	<p>Yes, the Council fully supports the business case for Crossrail 2 (CR2), and has been an active supporter for many years.</p>
<ul style="list-style-type: none"> Do you support a key objective of Crossrail 2, which is to 'accommodate housing growth and regeneration across London and surrounding regions'? 	<p>Yes.</p> <p>The Council believes that CR2 has the potential to drive growth both within and beyond London – just as we are seeing in Crossrail 1 and the Northern Line Extension in the north east of our borough at Nine Elms (although the Commission do still need to be realistic about the scale of growth which can be achieved around stations). Therefore we expect to see that the burden of funding doesn't fall just to London or inner London, but that the scheme is looked at in its entirety. For example, a CIL or business rates levy funding mechanism could equally (and proportionately) apply to all areas where growth is expected to occur. In other words, all land and property owners who benefit in any significant way from the project should pay their share, regardless of where they are located.</p>
<ul style="list-style-type: none"> What are your thoughts on the displacement or relocation of certain types of land use, or co-location of employment and housing, to optimise the delivery of new homes around key public transport nodes? 	<p>We would wish to see land designated for some form of employment use protected as far as possible given the benefits we have seen of mixed quarters which combine housing and a commercial use. Transport improvements such as CR2 would enhance opportunities to provide more housing and better connected and attractive office and retail space in Wandsworth.</p> <p>The location of stations we feel should continue to consider the wider benefits and opportunities of enhanced transport links. A case in point is our continued support for a CR2 station at Tooting Broadway (in preference to Balham) given the potential for the station to have a much more profound impact in the Tooting area.</p>
<u>The local opportunities offered by Crossrail 2</u>	
<ul style="list-style-type: none"> What do you perceive to be the benefits of Crossrail 2 in your area of interest? 	<p>For Wandsworth there are five key benefits:</p>

Question	Wandsworth Council's response
	<ul style="list-style-type: none"> • The northern line which runs through Wandsworth is currently at capacity. Northern line relief is a stated aim of Crossrail 2 to the south of central London and this is something the Council fully supports. • Enhanced travel opportunities for residents of the borough, providing easier access to a larger job market. • An interchange with Clapham Junction has potential to further assist in securing major redevelopment in this area and particularly beyond the Council's existing and advanced plans to regenerate its two large council estates immediately adjacent to Clapham Junction Station. There is also the potential further and more comprehensively regenerate the Station itself and these plans should be bought forward in parallel. • Given that Crossrail 2 extends to the south of London it is very likely to provide relief on the over-ground suburban routes through the borough (e.g. Wimbledon – Earlsfield – Clapham Junction) which are currently highly congested and only likely to get worse. It can also provide alternative access to central London from South London, avoiding an interchange at busy London termini, such as London Victoria and London Waterloo. • The original alignment through Wandsworth, which this Council strongly supports, would see the creation of a station at Tooting Broadway. As identified, Tooting is an area where there is significant potential for regeneration and economic growth and in turn the potential for cross subsidy. Transport infrastructure like CR2 will unlock that potential and also give greater accessibility to employment for residents. The proposed revised alignment in Balham will see less potential for growth. <p>It is important, given the pressure that existing transport is under, that these benefits are realised from CR2 <u>without</u> impacting on the capacity (short, medium and longer term) of existing over-ground suburban routes serving Wandsworth and the region.</p>
<ul style="list-style-type: none"> • Are there any key sites in your area of interest that you think Crossrail 2 could trigger a significant change in land use or the density of development? 	<p>The Council believes there is significant potential to see areas in the GLA designated Housing Zone redeveloped; in particular Clapham Junction station and areas to the South of the station which would compliment development taking place to the north between the station and the river. This should act as the catalyst to deliver an ambitious masterplan for the station itself (which may include over-decking the platforms creating significant mixed use opportunity). Clapham Junction could also be a prime employment centre given its significant accessibility to a large are of south-west London and beyond.</p>

Question	Wandsworth Council's response
<ul style="list-style-type: none"> To what extent is additional supporting infrastructure required to capitalise on the growth that Crossrail 2 could unlock? 	<p>Clapham Junction area – unlocking growth will require considerable re-design of the station – for example – over decking the platforms to create significant mixed use space.</p> <p>A further extension of the Northern Line from Battersea to Clapham Junction is supported by the Council and would create a key Northern Line – CR2 interchange – as well as unlocking further development opportunity.</p> <p>We also believe that some redesign of bus routes, standing areas and pick up points might better serve the growing residential quarter now being developed along the river and closer to Clapham junction.</p>
<p><u>Successful delivery and potential barriers</u></p>	
<ul style="list-style-type: none"> To what extent are you encouraging significant housing and employment growth? 	<p>To a very large extent. Through its new “Wandsworth Housing Offer” the Council has forecast that a minimum 18,000 new homes will be delivered over the next 10 years –one of the highest London Plan targets for any London Borough.</p> <p>Nine Elms, itself unlocked by the Northern Line Extension, is delivering 20,000 new homes and as many new jobs. Significant efforts are underway by the Council working in partnership with developers to secure employment for local people in the construction phase, which will reach its peak in the coming year.</p> <p>The area around Clapham Junction is already designated as a Mayoral Housing Zone with a target to deliver across the area 5,000 new homes over the next 10 years and improved and better connected commercial space.</p> <p>The Council is leading this drive through its already advanced plans to regenerate its two large estates north of Clapham Junction Station to deliver over 2,000 new homes. Further significant development will be delivered between York Road and the River Thames with this development being supported in turn by a newly adopted Supplementary Planning Document which will underpin increased levels of development in this area. CR2 will only help to drive and hasten delivery.</p> <p>In terms of the Council's estate regeneration plans, a development partner is now being procured by the Council to deliver large scale regeneration of these inner city housing estates (Winstanley and York Road), creating many more and better homes and a much improved local environment. The scheme will also include a new piazza area outside of the north side entrance to Clapham Junction Station and the</p>

Question	Wandsworth Council's response
	opportunity to provide possibly the best connected commercial and housing accommodation in South London.
<ul style="list-style-type: none"> To what extent are developments which are coming forward now in your area of interest in the absence of Crossrail 2 - compatible with local and regional plan designations and guidance? 	Developments are all compatible with the London Plan.
<ul style="list-style-type: none"> What potential do you think Crossrail 2 has to strengthen the employment market in your area of interest? Are any external factors needed to maximise Crossrail 2's beneficial impacts? 	<p>Key potential surrounds Clapham Junction and the ability to enhance commercial space in this area.</p> <p>Current permitted development poses a significant threat to business space in Wandsworth and therefore employment; if there is not consensus and agreement to protect such space and indeed enhance the commercial offer which is likely to have a significant benefit to the funding of CR2.</p>
<ul style="list-style-type: none"> What are the most significant barriers to achieving any additional development opportunities that might come forward as a result of Crossrail 2? 	<p>The current thinking about the realignment via Balham is a key issue for this Council and its residents.</p> <p>A regeneration master plan could unlock significant development and economic growth potential in the Tooting area (and beyond towards areas like Colliers Wood). The Council believes the potential for this economic growth far outweighs that achievable in Balham.</p> <p>Whilst we accept that the geological surveys indicate that Tooting Broadway will present additional technical construction challenges, TfL/Network Rail must weigh-up all the arguments very carefully - and certainly factor in the economic growth potential around Tooting Broadway station <u>before</u> taking any decision to move the alignment to Balham.</p> <p>Tooting's case is further strengthened over Balham if the following are considered:-</p> <ul style="list-style-type: none"> St George's hospital in Tooting – currently one of the poorest connected major trauma hospitals in the capital. A CR2 station at Tooting Broadway is likely to provide greater relief for the northern line than Balham (which is already connected into London Victoria). According to the Government's Indices of Multiple Deprivation (2015), the Tooting area is significantly more deprived than Balham; a clear indication of the potential for CR2 to bring economic regeneration and better access to jobs for thousands of residents.

Question	Wandsworth Council's response
	<ul style="list-style-type: none"> • Tooting Broadway is currently a major interchange for buses from across the south and south west of London – much more so than Balham. <p>In addition, unlocking the very significant development potential around <u>Clapham Junction Station</u> (which is already in progress) will require both public (TfL, Network Rail) and private (see private landholdings to the north and east of the station) land owners to come together and master plan to unlock development potential. The Council already has kick started this process on its own estates and it is now for others to come forward and commit to a more comprehensive regeneration plan that can be supported, sponsored and enabled by both regional and national government.</p>

Wandsworth Council

December 2015

NATIONAL INFRASTRUCTURE COMMISSION

Call for Evidence

London's Transport Infrastructure

JANUARY 2016



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On the 13th November 2015, the National Infrastructure Commission published a Call for Evidence with respect to three core themes:

- 1. Connecting Northern Cities**
- 2. London's Transport Infrastructure**
- 3. Electricity Interconnection and storage**

This paper comprises the response of Arcadis UK to the second of those themes, **London's Transport Infrastructure.**

Introduction

Whilst we absolutely understand the desire of the Commission to seek responses that are grounded in evidence and data, the overall vision and strategy for London is exciting and will undoubtedly lead to a step change in infrastructure and therefore economic outcomes, there is a concern that existing approaches to investment appraisal will lead to sub optimal outcomes.

Therefore, we have taken an approach that seeks to provide some guidance to overcome some of these challenges by referring to our experience in other countries, and looked at the strategic question of how to value the benefits of the various competing investment interventions and how to prioritise them in what will inevitably be a constrained funding environment.

We look forward to discussing this submission with the Commission in due course and expanding on both the themes and Case Studies contained within it, and to providing any additional information and analysis from the rich library of other case studies developed by Arcadis.

Question 1 – What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

London is home to 8.6 million people, is projected to grow to 10 million by 2030 and, assuming trend rates of economic growth continue, become a city of over 11 million by 2050. London competes on a global stage as one of the greatest cities on earth and if it (and the UK) is to continue to deliver the benefits that flow from this status it needs to maintain its competitive advantage. Yet London is suffering from an acute shortage of affordable housing (200,000 additional units by 2030), education (600 new schools by 2050) and healthcare, and together with congestion and its aging infrastructure, means the city is becoming an increasingly less attractive place to live and work.

Attracting and retaining the talent required to maintain London's competitive advantage would depend on the ability to improve the quality of life for Londoners (and its hinterland). Managing the impact of climate change and changing the behaviours around public consumption of (what are now regarded as) basic human needs such as electricity, gas, water, and now data, are critical to the next generation and delivering a more sustainable environment.

This pace of change brings into question London's ability to fund this growth and ambition. Current funding models will not always be flexible enough to meet the demands of the city, and the ability for London and the surrounding hinterland to work together and be more flexible and agile; will be critical to its success. London's Infrastructure Plan alone calls for around £1.3trn of required investment through to 2050 to satisfy this demand.

London has extremes of wealth, with the very wealthy central London and the whole western corridor out to the Thames Valley self-evident. What is less obvious is that London also has some of the most deprived areas of poverty in the country. Rebalancing and redistributing some of London's wealth creation along its North/South axis and eastern corridor are real opportunities to address shortfalls in housing and employment to stimulate wider economic and social benefit.

Question 2 – What are the strategic options for future investment in large-scale transport infrastructure improvements in London – on road, rail and underground – including, but not limited to Crossrail 2

The strategic options should be driven by the need to both rebalance London's economy as well as address London's wider growth agenda. This growth agenda is likely to result in the need for extra capacity on key corridors to alleviate congestion as well as improve journey times for all modes.

These strategic options should also be assessed using an appraisal framework that takes full account of the additional agglomeration benefits that would be derived from creating a faster, more frequent and more integrated London regional transport network. Whilst individual projects such as Crossrail 2 will undoubtedly have a significant impact, the wider network effects ought to be greater than the sum of the parts.

For example, traditional project appraisal would tend to look at the business cases for projects such as Crossrail 2, Bakerloo Line Extension and the Overground to Barking in isolation. However, couple this with the potential investment by Network Rail to upgrade the West Anglian line into Liverpool Street to four tracks, and then both put into the wider regeneration context of accelerating growth to the opportunity areas of Upper Lea Valley and North Bexley. The result is the creation of vibrant and dynamic wider economic zones forming a Northern corridor from London to the knowledge economy powerhouse of Cambridge, including the international transport hub of Stansted Airport.

A similar approach could be used to connect the South Coast upgrade into Victoria Station via Croydon create another linear economic zone including another international transit hub at Gatwick Airport. Indeed, whilst Arcadis understands the NIC has not asked for responses on Aviation capacity, we do feel justified in pointing out these additional benefits bought by the wider connectivity along a North/South axis for London and the surrounding hinterland. Additional runways can be built at all of Gatwick, Stansted and Birmingham (leveraging HS2 links) airports for the same level of investment as required by a single third runway at Heathrow, and would deliver similar economic gains.

Arcadis has used this approach to create models that maximise social and economic benefits for transportation links in other countries such as Asia and North America, and would be happy to share these with The Commission.

Of course, London and its hinterland is not a homogenous region. Whilst economic zones of considerable size could be created (such as The City, through the Lea Valley and then to Cambridge via Stansted), the needs of the citizens in this region will be very different to those in other parts of London and the South East. Given the fact that funding is always more constrained than would be ideal, choices have to be made and that means determining priorities. Sometimes those choices will have to be made taking account of qualitative as well as quantitative factors.

Arcadis has therefore developed a framework that enables policy makers to prioritise these strategic choices.

Prioritisation Framework

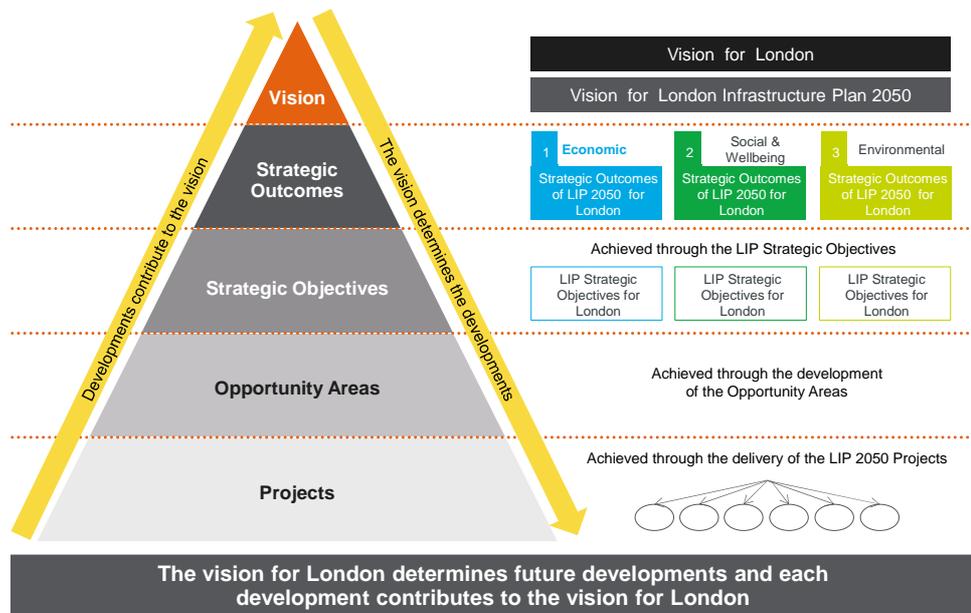
The establishment of a comprehensive appraisal framework that gives relevant weighting on a project-by-project basis and with appropriate local and regional context to:

- Direct User Benefits;
- Productivity Benefits;
- Investment and Employment Benefits;
- Changes in Land Use Planning.

will result in a more rounded approach to project appraisal.

A prioritisation framework is needed that takes account of factors that cannot always be easily quantified. Arcadis has experience of developing such a framework in London where the needs and agenda of the various Boroughs and Regions are often not aligned either economically or even politically, even though they all still see the benefit of functioning as a wider City Region. Below is an illustration of how the model works;

Prioritisation Framework Principles



A series of KPI's are developed for each of the strategic objectives that flow through to the Opportunity Areas to ensure the benefits are delivered over lifetime of the investment plan. These include employment, productivity and housing supply.

Question 3 – What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Having identified in Question 2 the benefits to be derived from a more integrated network that seeks to address both the needs to support the growth in London's wider economy as well as rebalance it, the question for Crossrail 2 is will the route currently being proposed support these objectives as much as it could do?

The criteria for assessing benefits needs to be broader than might traditionally have been the case. For example, is it correct that the benefit assessment for every station should be limited to a 1km radius from the station when the demographics for each are different? The private sector will always maximise their investment opportunity in a way the current appraisal model does not properly capture, particularly for densification and infill. Crossrail 2 will need to think and act more like a developer who runs rail networks, a good example of this approach being MTR in Hong Kong. London is a city with high land values with a growing population, and these land values could be sustained along the entire line of route with the right approach.

Arcadis have developed a model that assesses the wider social and economic benefits beyond the conventional scheme appraisal and this is set out in the case study below.

CASE STUDY – INTERNATIONAL RAIL PROJECT

Arcadis was commissioned by the Government of a major and rapidly developing country to undertake a socio-economic impact assessment study for a transformational investment in high-speed rail infrastructure. Having studied available literature and ex-post assessments of the economic benefits of High Speed Rail (the number and quality of such studies being still limited), Arcadis developed a new methodology to the ex-ante assessment of the economic benefits of High Speed Rail – the Socio Economic Development Plan.

The methodology assumes that rather than simply build the infrastructure and assume the private sector will respond to the availability of infrastructure by investing (which to an extent they will), a more accelerated and optimised approach to stimulating economic growth would come from a structured and proactive approach on the part of Government, whether national, regional or local. By assessing local physical, social and economic opportunities and aligning them to the broader economic and industrial strategy of the Government, we were able to identify for each of the principal economic centres on the line route, the industry clusters most likely to benefit from the introduction of a High Speed Railway and contribute the most to Agglomeration effects.

The opportunities identified through this process included:

- Physical Development – Integrated and Planned Land Use.
- Socio- Economic Development – Regeneration of key centres as well as improved mobility / development of talent.
- Business Opportunities – dramatic acceleration of the growth of emerging industry clusters (many in advanced and emerging technologies) through links to new customers and markets.
- Monetisation Opportunities – Land value increases generally as well as specific development opportunities at transportation hubs.

Overall, we determined that this approach could support a doubling of GDP compared to the current forecast for the same corridor over the next half century. Whilst the project was undertaken in a country with different socio—economic characteristics than the Northern Powerhouse region as well as being in a very different phase of economic and industrial maturity, the approach adopted in terms of planned interventions to maximise the Agglomeration benefits from major transport infrastructure has many similarities worth evaluating.

The influence of Crossrail 2 on regional networks should not be discounted either as 6-8 train paths per hour will be freed up into Liverpool Street and Victoria stations. Along the New Southgate branch a connection to Network Rail at Seven Sisters should be made.

In terms of cost reduction opportunities, in assessing whether the current route is in fact the right one, Arcadis believe you could omit King Road station (£600m saving) and with the Piccadilly Line upgrades being undertaken this calls into question the rationale for the New Southgate branch.

Question 4 – What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

The London Finance Commission has outlined its approach for funding London's infrastructure, largely based on keeping a greater share of the tax receipts generated by the city. Whilst this is a model that should be considered, Arcadis believe approaches are valid and possibly, in a hybrid form i.e. parts of different models used in tandem.

One of the challenges is to use models that are understood by lenders and investors and the risk profile can be managed. Some options for further consideration should be;

- For large one-off projects, the funding model used for Thames Tideway Tunnel and creating a separate Regulated Asset Base (RAB) has its place.
- London should utilize its asset base to create a balance Sheet approach. This would allow access to borrowing that is currently not available and is how the private sector would operate.
- Creating 'London Bonds' that finance a portfolio of projects and/or areas of regeneration.
- PPP – a model that has a poor reputation in the UK but commonplace in Europe and the United States.
- Community Infrastructure Levies (CIL's).
- Tax Increment Finance (TIF).

What the above illustrates is there are already a number of tried and tested models that should not limit London's ability to invest in its infrastructure. The finance is available. What is required are the conditions to invest i.e. stable policies.

Question 5 – How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied to London?

Arcadis has considerable experience of responding to similar challenges in cities in other countries. We have set out below one such case study in New York City that could be applied to London.

New York City will use the Lower Manhattan Resiliency Project (aka The Big U) to strengthen social and economic resiliency in climate-vulnerable communities, and to enhance the City's coastal defences in response to the evolving risks associated with climate change and other 21st century threats.

Lower Manhattan and its residents remain vulnerable to the impacts of climate change and sea level rise. The City's project, "**Protect and Connect**," will integrate physical and social resiliency into the diverse communities of Lower Manhattan through the implementation of physical projects, programmes, and policies. This will provide integrated flood protection to maintain the social and economic viability of neighbourhoods, and invest in resilient affordable housing by adapting building systems and neighbourhood infrastructure to protect homes from climate stressors. (see link

http://www.nycedc.com/sites/default/files/filemanager/Projects/Seaport_City/Southern_Manhattan_Coastal_Protection_Study_-_Evaluating_the_Feasibility_of_a_Multi-Purpose_Levee.pdf)

The funding vehicle was a Multi-Purpose Levee (MPL) which;

- Enhanced flood protection for Southern Manhattan.
- Resiliency programme funding source (i.e., the ability to self-finance and/or generate surplus revenue to fund other resiliency efforts); and
- Economic and community development (i.e., new economic activity, affordable housing, and open space; integration with Southern Manhattan's urban fabric and character).

The private sector developer revenues were projected from two sources;

1. The phased disposition of the rights to create new residential (market rate and affordable), office, retail, and hotel development on the MPL, in accordance with certain space absorption estimates; and
2. Ongoing property tax or equivalent payments in lieu of taxes ("PILOT") from new buildings on the MPL.

Revenues from development rights were estimated by modelling hypothetical vertical development cash flows for each of the uses described above and solving for the amount private developers would be willing to pay per square foot for the right to build each product type. These "residual" values per square foot were multiplied by the projected development programme for each development parcel to determine the revenue generation potential of each parcel in each of the different flood protection options under review. Payments for development rights were assumed to consist of a ground lease, structured as either a lump sum payment or a stream of future cash flows (the latter were calibrated to equal a lump sum payment in net present value terms).

The ground lease was assumed to generate a modest reduction in the value of development rights compared to land sale, which is consistent with observed conditions at other local sites subject to a ground lease such as Battery Park City.

This Feasibility Study's financial analysis relies on a number of assumptions relating to rents, operating expenses, property taxes, tax incentives, tenant improvements and leasing commissions for commercial uses, exit sales for income-generating uses, as well as sale prices for condominiums. These assumptions are based on historic data for Southern Manhattan's neighbourhoods, as well as reasonable projections of future conditions. Residential development on the MPL was assumed to be 20% affordable housing and 80% market rate housing.

In addition to the revenues generated through development rights, this Feasibility Study examined the revenues from property taxes or PILOT. The NYC Department of Finance provides detailed estimates of property taxes per square foot, by use and neighbourhood, in its "FY 2014 Guidelines for Properties Valued Based on the Income Approach, Including Office Buildings, Retail, Garages, Hotels, and Residential Properties." The Financial Feasibility analysis projects annual property tax revenues for each new development parcel on the MPL based on these estimates, which are weighted to reflect the breakout of each use on each such parcel.

Project costs can be financed with a range of different options. Depending on the magnitude of those costs, the availability of funds, and the preferences of decision makers, project costs could be financed:

- Directly through City, state and/or federal government capital budgets (and those of their component entities).
- With revenue bonds tied to on-site development proceeds and PILOT, with or without a public sector guarantee.
- By a private master developer in exchange for the right to develop on newly created parcels; or
- By a hybrid of these options.

Given the magnitude of potential MPL project costs and the range of potential new development on the different MPL typologies, a private master developer is unlikely to independently finance all project costs, even in exchange for the right to all project revenues. At the same time, given the constrained budgets of the City, state and federal governments, public capital grants would likely not be available to cover more than a portion of project costs.

The Feasibility Study assumes that a future MPL project would largely be funded with a combination of General Obligation bonds and revenue bonds. The latter requires public credit enhancement and/or debt service support, at least in the earliest phases of the project (i.e., before a critical mass of revenue-generating uses is completed). Therefore, to compare future costs and revenues, the financial feasibility analysis applies a discount rate associated with publicly supported infrastructure projects.

Project Financing Structures

The magnitude of project costs, as well as the potentially long gap between the beginning of MPL construction and the first deliveries of revenue-generating uses, suggests that a future MPL project may require some upfront public support to cover infrastructure costs. Depending on the option selected and a range of future decisions by policy makers, this public support requirement may vary. For example, a project with a higher affordable housing requirement or lower density would generate lower

revenues and could require a greater financial role for the public sector. This public sector role could include:

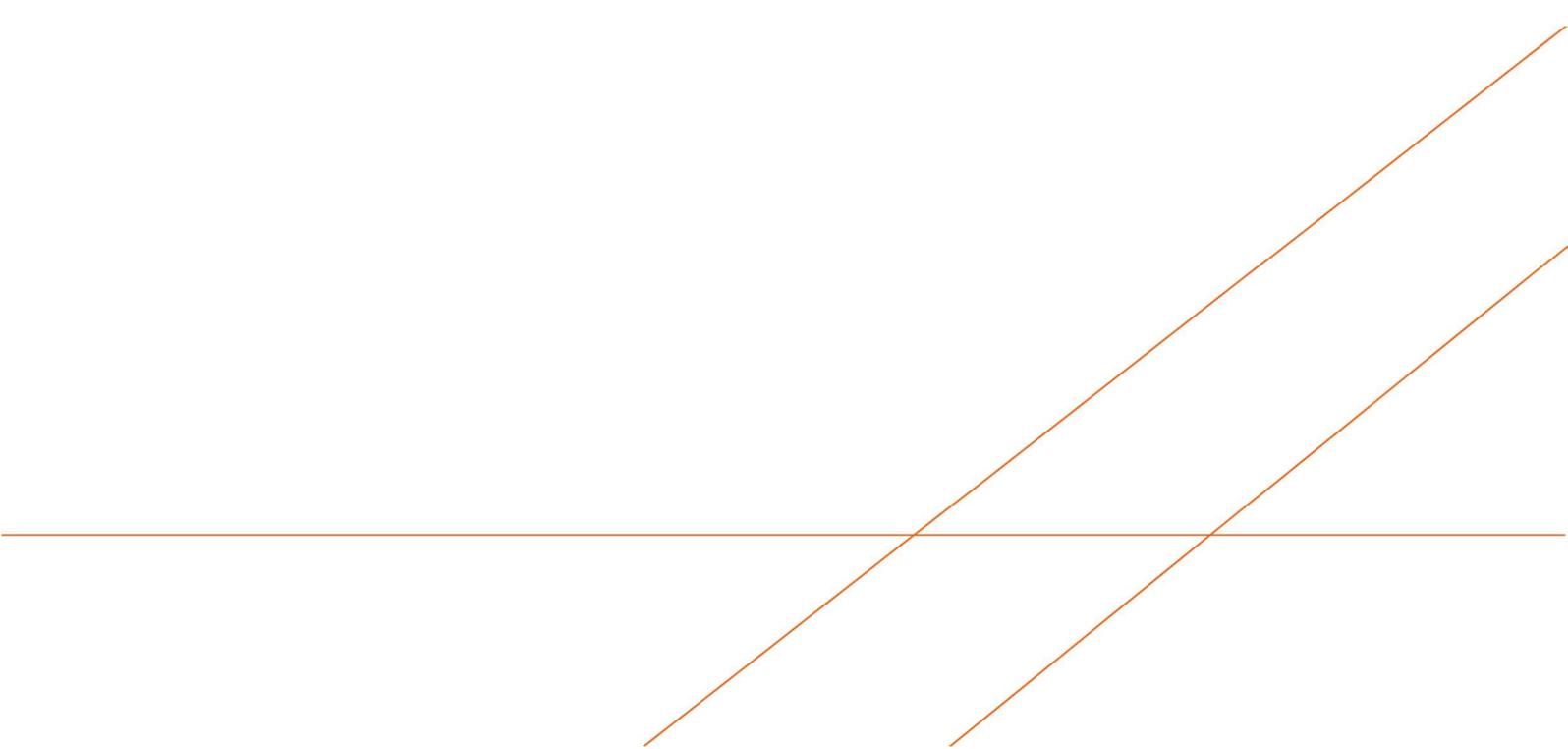
- Credit enhancement for initial bond issues, likely a requirement given the perception of risk during the early years of a new project.
- Debt service support prior to the completion of revenue-generating uses in order to minimize capitalized interest costs; and
- Capital grants from federal, state or City agencies to cover certain upfront costs as available.
- Project revenues, consisting largely of land sale or ground-lease payments and PILOT or property tax payments, would become substantial as the project is built out. Over time, these revenues could cover all required interest payments and pay down outstanding principal on infrastructure bonds. The time required to retire infrastructure bonds would depend on the degree of upfront public capital support and the degree to which capitalised interest can be avoided prior to the completion of revenue-generating uses.

The lesson for London is simply that there are proven funding models for the public and private sectors to work together, all it takes is political will.

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8 January 2016

Dear Sir/Madam

NIC Consultation – London’s Transport Infrastructure

For this topic area, we have not attempted to answer each question as set, however, we would hope it may be helpful to contribute some remarks that might inform the process and suggest a direction toward future lines of enquiry.

London’s Transport Infrastructure

London is a “world city”. It is a leading financial and commercial sector, hosting many of the world’s leading banks and corporations. It is a global hub for professional, legal, accounting, consultancy, and media related services. It is home to world-class research and development in numerous fields supported by a thriving academic network. And London is a global cultural centre, boasting world-class museums, galleries, theatres and night life.

In short, it is a thriving 24/7 metropolis that ranks among the most desirable locations to live and work in the world.

Much of that success is built on major infrastructure projects delivered successfully over the city’s history from Bazalgette’s sewers to the Jubilee Line Extension. Yet there is no room for complacency. As globalisation takes hold, there has never been a more pressing need to prepare for the future and ensure the Capital is fully equipped to compete in the new global marketplace, while providing for the domestic needs of its citizens.

With the capital’s population growing faster than homes, jobs and infrastructure can keep pace with, the case for strategic infrastructure investment is pronounced. London’s population is expected to increase from the current 8.6 million to more than 10 million by 2030 and reach a staggering 11.3 million by 2050. This prompts the obvious question ‘where will everyone live and work?’

Not only that, but London is also a major generator of wealth within the UK, so it is critical that London retains its pre-eminent role as an engine of growth for UK plc, as well as providing a roadmap for progress in other cities around the country.

London must remain competitive and it must remain an attractive place to live and work. Not just for the mobile global citizens contributing to the city's growth, but also for the many millions of Londoners who provide the critical lifeblood of the city. As such, London has to provide the hard and soft infrastructure needed to meet the needs of everyone.

To do so means supporting thriving commercial hubs alongside varied and affordable housing, as well as delivering accessible social infrastructure linked by seamless and effective, integrated transport systems.

Infrastructure investment in London can therefore no longer be a series of speculative thoughts about what could be delivered in the future. Rather it must deliver a comprehensive series of packages to drive growth and demonstrate to investors that London can and will stay ahead of the curve.

London's strong performance can support the infrastructure investment required in the North and elsewhere. However, the purse strings cannot simply sit within public sector coffers. A new system of funding and de-risking projects needs to be explored in partnership with the commercial sector. Options for new financial vehicles and delivery arrangements akin to some of the successful projects delivered in recent years across the USA and Asia should be carefully examined as part of the Commission's process to find appropriate and new financial solutions.

The transport element here provides a major challenge for London. Not only is much of London's existing transport network over 100 years old, it is operating at a capacity level way beyond that envisaged by the original design. As a result, London's road and rail networks require a high level of maintenance to operate at these levels.

Under-investment in this area would represent a clear brake on the city's prospects for development and growth. Equally a massive shortage of affordable housing, especially adjacent to good transport facilities, represents a potential curb on future development and the city's global status.

There are a number of potential schemes which address some of the issues and should certainly feature on the core list of priorities including the Upper and Lower Lee Valley, Barking Peninsula, Old Oak Common, Ebbsfleet and other areas of South London. Additionally, there is a need to investigate the multiple value outcomes of future infrastructure which includes flooding, landscape, development value, and transport with multiple outcomes which should be acknowledged earlier on in the cost benefit analysis of projects.

A particular project that Arup considers fundamental to the infrastructure investment plan in London is Crossrail 2. It needs to deliver an ambitious scheme which links the fortunes of highly productive parts of London, with other areas of latent potential. Yet, we also consider an approach should be taken where Crossrail 2 has a focus on orbital connectivity so that we do not see 'all roads leading to the CAZ and major employment areas', but instead to capitalise on the opportunity to develop successful growth nodes in outer parts of the capital.

Analysis points to the need to improve orbital connectivity around London and we think can be delivered incrementally with less burden on financial resources. The case is particularly strong when looking to areas with latent potential to deliver housing and employment clusters. Moreover, links to strategic growth corridors stretching out of

London to places like Cambridge, Gatwick and Brighton provide a growth story greater than the sum of its parts.

Looking to these examples, it is the ability to deliver jobs and homes which drives the choices for the route, rather than the route dictating the growth. In the instance of connecting Wimbledon to Croydon, a whole new corridor for connectivity could drive investment and jobs to supplement the growth of CAZ with new opportunities for complimentary growth corridors.

A link from Purley to Gatwick that takes in a link to Crossrail at Heathrow also provides for a series of employment and housing opportunities that will be lost with a radial route straight through the centre of London.

Our proposal is to consider a 'star and cluster' approach to London's growth which improves connections in these areas, with targeted regeneration investment alongside to transform the places which need it most, including Croydon, Barking and the Upper Lee Valley.

The challenge for the NIC will be to decide which projects are the easiest to fund; which offer the maximum potential for development; and which provide the greatest capacity and resilience gain for the network as a whole. It is undoubtedly a challenging prospect, but one that will be made easier with the advent of the NIC and a chance to develop a truly long-term view of how the UK should meet the needs of the Capital.

Arup stands ready to support the work of the NIC in the months and years ahead to make this initiative a success for the benefit of both London and the UK as a whole.

Yours faithfully

James Kenny
Head of Global Affairs, Arup

ACE Evidence: London's Transport Infrastructure

ACE response to the:

National Infrastructure Commission Call for Evidence

8 January 2016

About ACE

As the leading business association in the sector, ACE represents the interests of professional consultancy and engineering companies large and small in the UK. Many of our member companies have gained international recognition and acclaim and employ over 250,000 staff worldwide.

ACE members are at the heart of delivering, maintaining and upgrading our buildings, structures and infrastructure. They provide specialist services to a diverse range of sectors including water, transportation, housing and energy.

The ACE membership acts as the bridge between consultants, engineers and the wider construction sector who make an estimated contribution of £15bn to the nation's economy with the wider construction market contributing a further £90bn.

ACE's powerful representation and lobbying to government, major clients, the media and other key stakeholders, enables it to promote the critical contribution that engineers and consultants make to the nation's developing infrastructure.

Through our publications, market intelligence, events and networking, business guidance and personal contact, we provide a cohesive approach and direction for our members and the wider industry. In recognising the dynamics of our industry, we support and encourage our members in all aspects of their business, helping them to optimise performance and embrace opportunity.

Our fundamental purposes are to promote the worth of our industry and to give voice to our members. We do so with passion and vision, support and commitment, integrity and professionalism.

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Q1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

The story of London over the past twenty is one of success, a story that has seen the capital move from a declining, unattractive place, to one where people want to come and live and work, and in which companies wish to invest. The cities transport networks have, understandably, come under increased pressure due to this trend, and could be a significant hindrance to growth in the coming years.

In 2015, the capital's population reached 8.6 million people, surpassing the previous peak seen in 1939. The GLA's London Infrastructure Plan 2050 estimates that London's population is likely to rise by around 37 per cent to 11.3 million by the middle of this century. The higher end estimate suggests it could go as high as 13.4 million, however.¹ This growth equates to roughly two tube trains per week!

In addition, estimates suggest that there will be an additional 1.4 million jobs in London by 2050, an annual increase of 0.71 per cent, with two-thirds of these expected to be located in the inner-city boroughs. On top of this, there will be increases in visitor numbers, with the best estimates being that by 2022 around 21 million tourists will come, an increase of 40 per cent in the decade since 2012.²

In addition, and although outside the remit of the National Infrastructure Commission's terms of reference, an increase in visitor numbers will see added pressure on London's air connections. Further capacity will be required, as will the connections and ability to move passengers on the transport links to and from wherever this is provided.

All of this means there are obviously significant implications for demand, with Transport for London estimates suggesting that it will increase by up to 50 per cent, with traffic on the Underground and rail networks rising by 60 and 80 per cent, respectively.³

This will all occur in the context of increasing economic, financial, and fiscal devolution as central government continues to reduce the amount of subsidy from Whitehall to ensure the elimination of the UK's deficit. Future mayoral administrations must therefore ensure the capital must develop its own innovative funding mechanisms for the operation of Transport for London (TfL), with the aim of delivering a cost effective service for London's residents.

¹ *London Infrastructure Plan 2050 A Consultation* (2014), Greater London Authority, p. 7

² *Ibid*, p. 8

³ *Ibid*, p. 9

Q2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

- How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?
- What might their potential impact be on employment, productivity and housing supply in London and the southeast?

The needs of London in terms of its transport infrastructure, fall into roughly three categories: capacity, connectivity, and capability. There are growing challenges around and increasing and an aging population, and all that entails in terms of economic and social activities. It is, therefore, vital that our transport networks have the ability to carry increasing and diversifying demand, that they connect with where people need them to, and that organisations and individuals have the resources and abilities to deliver and make use of them.

As stated already, by 2050 the capital will need 50 per cent more public transport capacity. Crossrail 2 is, therefore, a vital project that will provide much-needed capacity on a network that will soon have to cater for ten million residents, as well as numerous commuters from outside London.

Transport for London has a swathe of other initiatives, however, including the existing upgrade programme to the Underground network that will see 36 trains per hour on the Jubilee, Piccadilly, and Northern lines by the mid-2030s. This will increase peak capacity on these lines by between 20-50 per cent.

There are also plans to extend the Bakerloo line south from Elephant and Castle to Lewisham and beyond, transforming connectivity in South London. The modernisation of key central London stations including Holborn, Euston, Victoria, and Waterloo, that will also be a catalyst for the growth and development of the surrounding areas, is also proposed.

On the rail network, the long term aim of the Mayor's Office and Transport for London is to gain further control of the commuter routes in and out of the capital. This has the potential to transform the rail network inside London's boundaries into the equivalent of a second tube network, in terms of capacity.

Through closer collaboration with Network Rail to provide more trains and carriages per hour, the authorities in London feel it is possible to carry twice as many passengers than at present, reducing crowding.

As for London's roads, in terms of strategic interventions, again Transport for London has significant plans in this area, with up to three new river crossings proposed for the capital east of Tower Bridge and a new inner orbital tolled road tunnel that could see congestion reduced by 20 per cent in central London.

ACE's members feel that the best way motorists can be supported is to provide them with a reliable asset, i.e. the road, with as little disruption as possible and as cost-effectively as possible. They feel this can best be achieved by closer collaboration with all the parties involved in this process, from Highways England, TfL, the GLA, and the boroughs.

This collaboration will have the same benefits as those outlined above. More innovative solutions will be delivered with less disruptive last-minute changes that add cost and time onto a project. Motorists will therefore be able to enjoy a better quality road and journey, traffic will flow more smoothly, and the business of the capital will be conducted more efficiently.

Continued support should also be provided for efforts to promote cycling in London, with the provision of improved infrastructure, particularly along the capital's roads and in the form of the Cycle Superhighway network. For example, 'rest areas' along the routes could be introduced with covered areas, access to tools, and volunteers from the London Cycle Campaign during weekends. This could help people adjust their bikes and provide support for those cycling with children.

Much of the work to develop these options is already being carried out by Transport for London, along with the correct staging and prioritisation of the projects across all modes of transport. ACE would encourage any recommendations from the National Infrastructure Commission to take this into account and to ensure that the construction sector's desire for certainty through a visible and stable pipeline is met as far as possible.

Q3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Crossrail 2 on its own has a cost-benefit ratio that will see around £1.80 generated for every £1 invested in the project, according to research by consulting firm PWC. This increases to a range between £2 and £2.60 when wider economic benefits are taken into consideration according to the same research and from data provided by AECOM, the global engineering firm. 4 London First in their report, Funding Crossrail 2, estimate that it could be even higher, at £4.10⁵

⁴ *Crossrail 2 Funding and Financing Study* (2014), PWC, p. 11

⁵ *Funding Crossrail 2* (2014), London First, p. 6

There exists significant opportunities, therefore, to dramatically increase the already significant benefits to London and the whole UK when constructing and operating Crossrail 2. Much of this will involve factors beyond the scope of a purely transport-focussed project and hence will need input from a multitude of stakeholders and interested parties, and require broader consideration than other projects.

There will be a massive opportunity for significant regeneration all along the route of Crossrail 2, from the area around Shepperton and Chessington in the South to Cheshunt and the upper Lea Valley in the North. This could represent a substantial number of jobs, housing, and prosperity in areas where it could do a lot of good.

In addition, this is an excellent opportunity to line up major infrastructure projects in order to get the most out of supply chain efficiencies, skills developments, and therefore save on costs. London is embarking on a number of projects that require, for instance tunnelling skills and if schemes are planned properly it will be possible for these trained experts to transfer from one project to another seamlessly.

This will have the benefit in the first instance of training up a large number of skilled experts, benefitting them and the wider economy. It will also enable the UK to position itself as a global expert in tunnelling as our engineers are trained up and gain first-hand experience of what it is like to engage in this kind of work. Finally, there will then be little need to scour the world for expertise, driving up costs, and relying on externalities not influencing the labour market.

This is just one example as well, there are multiple disciplines that will be needed to undertake a project such as this and that present an excellent opportunity in training and developing an expert workforce.

Finally, committing early, planning thoroughly, and lining the project up so that it fits seamlessly into a programme of other large-scale infrastructure projects will ensure that all companies involved in the process can themselves plan effectively, allocate resources efficiently, and enable the project to be delivered on time and on budget. Certainty is the key to delivering a project like Crossrail 2.

Q4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

- What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?
- What innovative funding mechanisms could be considered to support delivery of key schemes?

ACE supports a mixed approach to the funding and financing of London's transport infrastructure improvements, especially when it comes to Crossrail 2.

Specifically on Crossrail 2, ACE feels that much good work has been done by the London First Crossrail 2 working group, which published a report looking into this particular issue, and would encourage the National Infrastructure Commission to give strong consideration to its recommendations.⁶

Based on 2012 prices this would involve a grant from central government of around £4 billion, while Network Rail would contribute £2 billion to a final cost of around £16 billion, subject to an exact contingency figure that Treasury insists on incorporating into the total. These figures, however, would be more than recouped by government and the UK's rail infrastructure owner through increased tax revenues and reduced congestion on the existing network.

Contributions totalling just over £6 billion from the existing Transport for London farebox and borrowing based on Crossrail 2's potential farebox should also form a significant part of any funding of the project. Contributions from developers, as well as the potential for intensified development of land in and around stations could also bring in around £3.5 billion, along with another £2.5 billion in the form of council tax and business rate contributions.

A significant source of funding, however, could come from a greater amount of fiscal devolution. At present a mere seven per cent of all the tax paid by London residents is retained by the Mayor of London and the boroughs, while the equivalent figure for New York is around half.

Devolving control of property taxes, as well as lifting borrowing ceilings, in conjunction with a parallel reduction in the grant from central government would see funding of around £5 billion made available for the Mayor of London. This could then be put to use on Crossrail 2, or indeed, other infrastructure projects in due course.

This last point is an essential one too, for funding future projects beyond Crossrail 2. This fits into the government's agenda around devolution, and would be consistent with measures implemented in other areas of the country such as Cambridge and Manchester. In addition, it could also help to meet the target of eliminating the deficit and paying down the national debt.

This kind of mixed approach should be one that becomes the standard for delivering large scale, long term infrastructure in London. The exact nature of the make-up of each element should be within the remit of Transport for London, however, with the options of

⁶ London First, *ibid.*

borrowing money, requesting funds from central government, eliciting contributions from developers and business partners, all contributing.

Ultimately, this will contribute to the certainty that the construction sector requires through the ability of Transport for London to plan into the longer term and fund projects itself without as much recourse to central government. In turn, Whitehall will benefit from increases in tax revenue and improved efficiencies in the capital.

Q5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

In ACE's view, there are three case studies of major metropolitan areas in other countries that have shown innovative responses to similar challenges and priorities that London is itself facing. These are Paris in respect of long-term certainty, Hong Kong in respect of innovative funding solutions, and New York in respect of devolution of powers.

We have that in Paris, the authorities there have developed an ambitious, innovative, and fully funded plan for almost every aspect of their transport network up to 2030. Known as 'Le Nouveau Grand Paris', this has allowed all those involved to plan thoroughly, align projects to enable the efficient allocation of resources, and ensure budgets and timetables were realistic and achievable.⁷

In Hong Kong, public transport is operated by the Mass Transit Railway (MTR) Corporation, one which posted a \$2 billion profit in 2012. It did this through 'value capture', taking advantage of the uplift in values and profits through the increased passenger traffic that is provided by their services. This can then go to subsidising further expansions and upgrades, all while keeping fares low.

Finally, as stated above, we have seen New York enjoy high levels of fiscal devolution, with around 50 per cent of all tax revenues raised in the city remaining there. A similar approach in London, with more of its funds being placed at the disposal of the Mayor, would enable greater decision-making ability and allow for increased certainty through improved planning.

⁷ *Le Nouveau Grand Paris* (2015), Syndicat des transports d'Île-de-France, http://www.stif.org/IMG/pdf/dpi_2015_ensemble-fiches-projets_mel_bis.pdf

National Infrastructure Commission: Call for evidence

APM background

The Association for Project Management (APM) is a registered charity with over 21,000 individual and 550 corporate members making it the largest professional body its kind in Europe. APM is committed to developing and promoting project and programme management through a wide range of activities including membership, qualifications, events and enhancing standards and knowledge in the profession.

About APM's call for evidence and background of respondents

APM held an online survey which was open to members and the wider project management community. Responses came from a wide variety of business sectors such as transport and logistics, consultancy and construction as well as a broad spectrum of roles including project managers, academics and company directors. The timing of the call for evidence reduced the opportunity for the fullest consultation, so this document presents an informal synthesis of responses received, rather than a formal statement of APM policy.

NIC Call for evidence

I Connecting northern cities

1) To what extent are weaknesses in transport connectivity holding back northern city regions (specifically in terms of jobs, enterprise creation and growth, and housing)?

Respondents felt that weaknesses in transport connectivity are currently playing a major role in holding back the development of enterprise creation and growth in northern cities. Job creation was also an area of concern in terms of connectivity with respondents noting that connectivity played some extent in regards to this issue. Housing was not a great issue amongst respondents, with most believing that connectivity had little or no impact on the northern housing market.

2) What cost-effective infrastructure investments in city-to-city connectivity could address these weaknesses? All transport modes are open for consideration.

Some respondents noted that road users could be reduced by expanding the Manchester Metrolink into Cheshire which would primarily serve to support the Cheshire hinterland around Manchester. It was felt that Manchester Airport railway station has a useful range of services but the lack of parking, very limited pick up and no bike facilities, means it is impractical for many would be travellers particularly locals who have not flown into Manchester Airport. A railway link from Manchester Airport south connecting into the Manchester- Chester line, would considerably improve the access to the Airport from Chester and surroundings. Modern electrified rail services with fast and reliable commuter services are desperately needed throughout the north of England, both between and within cities. Rail connection to airports such as Leeds and Manchester are essential. Rail networks should also consider more reliable goods transport to take heavy goods vehicles off the road thus rail development should be prioritised over building new and enhancing existing roads.

All respondents felt that, although road transport will continue to be highly important, is important to note that it is only one form of communication and is currently close to maximum capacity. Respondents noted that by including on-line and virtual communication methods when considering infrastructure investments, it would be easier to identify the essential from the nice-to-have. It was felt that a policy of nationally driven localisation would create the capability for regions to identify and resolve their own transport needs which would speed up action and create a greater focus on sustainable regional needs.

In terms of funding, respondents believed that the current regulated privatised system in key transport modes exposes the taxpayer to all of the downside risk and the private sector to all of the upside risk. They considered whether it would be possible to run a multimodal tender where private and public sector bid on the same basis. It was felt that running a tender like this, with all costs truly pushed up front, allows for the different bodies real risk appetite to be shown, ensuring that a true cost can be identified and assessed appropriately.

3) Which city-to-city corridor(s) should be the priority for early phases of investment?

Respondents considered a number of potential corridors which they felt should be considered as priorities for early phases of investment. These included:

- The expansion of the Metrolink into Cheshire
- Hull and Grimsby (docks) to Leeds
- Leeds to Birmingham
- Leeds to Newcastle
- Manchester to Birmingham
- Manchester to Liverpool

4) What form of governance would most effectively deliver transformative infrastructure in the north, how should this be funded and by whom, including appropriate local contributions?

It was suggested that a strategy of regional empowerment could involve some type of pan-northern political body to make the decisions. This could potentially be headed by Ministers and include northern MP's and Councils with oversight from central government to ensure that national interests were not compromised when achieving only local gains. The advantage of such an approach would be centralised information and idea sharing which might stimulate growth with sustainable solutions conceived by the areas impacted by change. It was also felt that local employers should have a voice and thus involved in the funding solution.

Funding could be from a combination of central and regional potentially supported by fairer distribution of existing subsidies, possibly away from London, and by reducing road infrastructure development in favour of rail and by private contributions from rail operators as well as government capital and borrowing.

5) What are the key international connectivity needs likely to be in the next 20-30 years in the north of England (with a focus on ports and airports)? What is the most effective way to meet these needs, and what constraints on delivery are anticipated?

Respondents believed that both Leeds-Bradford and Manchester airports had the potential for expansion but require enhanced rail links and more long distance flights in order to reduce the need to travel to airports in the south east. All respondents noted that northern ports have an important role to play in terms of international connectivity over the next 20. Sunderland, Grimsby/Immingham and Hull were cited as potential models which would serve to support UK import and exports and hopefully help support a northern powerhouse built around engineering and advanced manufacturing. Success at these ports may also open the way for Newcastle or Middlesbrough ports to be further developed to respond to changes in demand and volume.

2 London's transport infrastructure

1) What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

Nearly all respondents believed that the UK is overly reliant upon London and the South East which has led to over-crowding, inflated property prices and increasing pressure upon its infrastructure and services.

Many also felt that this 'London centrality' fuelled unnecessary travelling into London whilst creating a lack of investment in the northern cities and elsewhere. Most respondents felt that incentives are needed to encourage people to move to other parts of the country to utilise the available resources and capacity in other UK settlements.

2) What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

Respondents only offered limited guidance in answering this question but many felt that large scale infrastructure developments could be diverted from London to northern cities.

3 Electricity interconnection and storage

1) What changes may need to be made to the electricity market to ensure that supply and demand are balanced, whilst minimising cost to consumers, over the long-term?

Many respondents noted that in the short term, local generation through wind and solar energy should be encouraged and supported, with some local storage and less reliance on the national grid. Demand management can only be assisted by improving housing stock and price incentives. Participants noted that the UK faces a major power supply shortage with poor resilience, lack of generating capacity and poor distribution. Most of the market questions cannot be addressed adequately until secure supply is achieved.

2) What are the barriers to the deployment of energy storage capacity?

Much household demand could be for low voltage, such as can be generated by solar energy and stored in batteries. Respondents suggested that new housing might have a low voltage distribution network for lighting and electronic items. For higher voltage storage, options were limited.

3) What level of electricity interconnection is likely to be in the best interests of consumers?

Respondents believed that one of the main issues is the fragmentation of the market which makes it impossible to coordinate interconnection. Participants considered that a larger grid may not be required if there were more localised generation and storage.

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January 2016

National Infrastructure Commission call for evidence – London’s transport
infrastructure
IPSE response

January 2016

ADVISING
EMPOWERING
INSPIRING
SUPPORTING
ENABLING
**INDEPENDENT
PROFESSIONALS**

About IPSE:

- The Association of Independent Professionals and the Self Employed (IPSE) represents the estimated 4.5 million individuals working for themselves in the UK.
- Over 97% of our 20,000 members work through their own limited companies
- IPSE also represents 48,000 self-employed construction workers through our relationship with leading construction contract and payroll providers Hudson Contract
- Research has shown that independent professionals allow businesses to promote innovation, maximise performance across peaks and troughs in demand, and create jobs by increasing the level of innovation and efficiency in the economy.

London's transport infrastructure

- 1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?**

Housing

With London's population expected to hit ten million by 2030, the development and provision of appropriate housing is clearly going to be a major challenge in the coming years. Welcome steps are being taken to address this, for example with the £103 million funding package announced by the Mayor of London in 2012 to support the development of 2,700 homes. Similarly, IPSE was pleased to hear the announcement from the City of London that it planned to build 3,700 new homes by 2025 on housing estates and other land it owns outside the Square Mile.

To ensure these projects are fit for the way people will work in the next two to three decades, IPSE believes government should ensure that new housing developments are equipped with fibreoptic broadband as standard. This will be particularly beneficial to the growing numbers of self-employed individuals in the labour market who are looking to strike out on their own and grow a business.

There are already 4.5 million individuals working for themselves, delivering flexible expertise to a wide range of businesses while enjoying the autonomy this way of working offers. As the [2013 paper](#) by Professor Andrew Burke illustrated, independent professionals allow businesses to promote innovation, maximise performance across peaks and troughs in demand, and create jobs by increasing the level of innovation and efficiency in the economy.

This focus on housing will provide a big boost for the UK's construction sector, where 2.1 million individuals work contributing £103bn, or 6.5% of total economic output, to the UK economy.

Flexible workspace

As the labour market continues to shift, with individuals choosing the greater autonomy that comes with self-employment, government will need to pay greater attention to where people work. Those working independently are increasingly opting to work in collaborative workspaces known as "workhubs" – there are an estimated 40 in London today.

Workhubs typically consist of hot desks, meeting rooms and high speed broadband. They also offer services such as IT and business support and other training programmes. This collaborative way of working provides a motivating environment, as well as helping to build a community of like-minded individuals. As research from the Brighton Fuse project has shown, this environment allows freelancers to more easily share ideas, innovate

and ultimately grow their business. It is however difficult, and often financially prohibitive to open and run premises.

Indeed one third of 18-39 year olds identify cost as a major reason why they do not use workhubs. Freelancers unfortunately do not benefit from the tax system in the same way most small businesses do. This is because small businesses with premises are exempt from paying business rates, yet those using workhubs are effectively forced to pay them indirectly. This is because they are typically a significant part of the operating cost of many workhubs, which are often run by collectives of self-employed workers.

As this way of working becomes even more common, the planning system may prevent the speedy rollout of workhubs. Identifying a site is one thing, but getting planning permission can be difficult. Reclassifying retail properties as office space has proven difficult for a number of workhub developers.

To support this way of working, IPSE believes action is needed in four key areas:

- Cut business rates for workhubs – small businesses with a rentable value up to £10,000 are eligible for 100% business rate relief – extending this to workhubs would ensure independent professionals are also effectively incentivised to develop and grow their business
- Incentivise the use of empty properties as workhubs – councils could easily address this blight by publishing interactive maps of disused buildings in the area. This would include the dimensions of the property, its rateable value for business rates and its previous use.
- Extend Permitted Development rights to allow empty premises to change their use – government should explore allowing empty retail premises (A1, A2, A3 & A4) over 500m² to be reclassified as B1 office space under permitted development rights.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

Transport connectivity is vitally important for the self-employed. IPSE survey data from 2015 found that independent professionals travel on average 1,775 miles each month to their place of work, while spending £8,056 each year on transport costs.

Investing in all forms of transport infrastructure is therefore vitally important in allowing freelancers the freedom to travel quickly, delivering flexible expertise to businesses of all sizes. When travelling by rail, policymakers can also go further in helping freelancers work on the move. Ensuring rail franchising agreements include a commitment to enabling WiFi across their networks will provide a productivity boost to the large number of freelancers who regularly travel into or from London.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

As with all large infrastructure projects, greater effort needs to be made to open up the procurement process to smaller businesses and collaborations of independent professionals. Often it is only the very largest businesses who can compete here, given the onerous compliance requirements and very complex contracts.

But this does not always lead to satisfactory outcomes. The cost and complexity of large contracts can lead to delays and ultimately hit the public purse. For example, it was widely reported in 2015 that taxpayers could be hit with a bill for up to £700m after the government reportedly lost a legal battle with Fujitsu over a failed NHS

IT system. The Fujitsu Connecting for Health contract was part of the £12bn NHS national programme for IT, large parts of which have had to be abandoned at a cost estimated by the National Audit Office to be £2.7bn.

As important infrastructure projects are delivered in London over the next twenty years, government clearly needs to move away from its dependence on larger suppliers to deliver projects, instead effectively using the unique flexible expertise that independent professionals offer and the value they deliver for complex projects.

In delivering large infrastructure problems in London, government should build on its ambition that 1 in every £3 of government spend will be with SME. It should go further in breaking up contracts, committing to a sub-target that a quarter of spend within the SME ambition will be with microbusinesses including collaborations of independent professionals.

In addition, government should commit to publishing tender documents in an open source, editable format. This would allow microbusinesses to suggest revisions and flag up aspects of the contract which present difficulties.

It is of course inevitable that some large London infrastructure contracts will be awarded to larger businesses, but this doesn't mean independent professionals have no role to play. A Cabinet Office study has found that the fifty largest suppliers to government are responsible for 35% of government spending, and there must be a role to play for our smallest businesses further down the supply chain.

IPSE believes a greater onus must be placed on these large "tier 1" contractors to demonstrate how they will open up opportunities for subcontracting to the widest possible group. Tier 1 contractors should be expected to publish details of who they contract with in order to promote accountability.

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London's transport infrastructure

What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

London faces a number of key challenges over the coming decades. The City continues to grow at a rate not seen for many years (the fastest rate in 80 years) and our work has shown that the existing London Plan and the Mayor's London Infrastructure Plan (2050) are underestimating the level of population growth and employment growth that the city can expect over the next 25 years. This has significant implications for London in relation to how the population can be accommodated, how people will travel to work, access to job opportunities, the city's environment and quality of life. The hard and soft infrastructure that will be required to support this growth will need to be planned to deliver these greater levels of growth, but will also need to be adaptable to future changes in the economy, environment and society.

The recently published Atkins report Future Proofing London (which can be downloaded from our [website](#)) identifies four key interlinked risks that London faces which include:

- Housing - A failure to meet the city's housing needs
- Economy – the economy becomes less diverse
- Society – society becomes more unequal, and increased social tensions impact on London's stability
- Environment – the city's continued growth degrades the environment further impacting on quality of life

The following provides further detail on each of these key economic and social challenges and provides a reference to the appropriate section in the Future Proofing London report where further illustration and detail on these points can be found.

Population and employment growth greater than expect and planned for

As part of our work on Future Proofing London we worked with Oxford Economics to look at future population and employment scenarios for London. Oxford Economics forecast London's population to reach 12 million by 2050 compared to the London Infrastructure Plan (2050) that projects the population to reach 11.3 million by 2050. This is a difference equal to the current size of Manchester.

The London Infrastructure Plan forecasts jobs to reach 6.3 million by 2050, this is a level that Oxford Economics forecasts will be surpassed by 2026.

If these projections that underpin London's strategic and infrastructure planning are underestimating the level of growth that is likely in London, then the city will be failing to plan properly for its growth, and the risks we have identified will be exacerbated.

(for further detail on the population and jobs growth see section 3 pages 38-40 of Future Proofing London).

Housing

Housing is a vital piece of the city's infrastructure, without sufficient housing London cannot continue to accommodate population growth and house those that work in the city. Housing demand continues to grow as the population increases and with population estimates identified above this demand is not set to ease any time soon.

Supply is failing to keep pace with demand, current rates of housing delivery (26,000 pa) are well below London Plan housing targets of 42,000 pa, and the London Plan target itself is likely to be below what is actually required (with many suggesting 50,000 homes per annum are required).

The increasing demand for housing and the chronic undersupply of housing are combining to make housing affordability a serious issue for London. On top of this, wages have not increased at anywhere near the same rate as house prices, this is not just an issue for those on low incomes but also for those on medium incomes.

These housing issues are pushing people out of both central London and London entirely to find a place to live. Some of those moving out of London are retaining their jobs in London resulting in ever greater commuting distances.

(for further detail on housing challenges facing London see section 4 pages 45-50 of Future Proofing London).

Economy

Jobs growth over the past 15 years has been focused on the Central Activities Zone (CAZ) with less growth in outer London. With job densities much greater in inner London, many outer London residents are reliant on commuting to jobs in central London. The trend in greater job growth in inner London compared to outer London is expected to continue and as a result there will be a need to consider the implications this has for outer London communities and London's transport infrastructure.

Much of the job growth has been in high value sectors (such as professional, real estate and scientific and technical activities) again with the greatest concentrations of growth in these sectors being in inner London. However the cost of housing is impacting on the ability to fill graduate vacancies in these professional sectors. The housing crisis could lead to labour shortages (across all sectors of the economy) and / or increasing reliance on people commuting from greater distances to fill jobs.

Coupled with the growth in high value sectors has been the decline in employment in lower skilled jobs, which are forecast to decline further. This continued shift to a higher value economy has its benefits (particularly in terms of GVA growth), but it also presents challenges with regards to whether there are sufficient job opportunities available to the lower skilled population.

The sectors of the economy that will see substantial jobs growth in London are going to change, with greatest growth in professional, scientific and technical services (28% of all jobs growth 2015-2030) administrative and support (16%) and information and communication (10%)

and limited growth in financial services (0.6%) in what has traditionally been a big growth sector for London. Many of the businesses in knowledge based sectors are small scale and often rely heavily on affordable and flexible business space, rather than traditional office accommodation. With the continual loss of industrial and business space to competing land uses (such as residential) these sectors may find that land and premises availability and affordability act as a constraint on growth.

(for further detail on housing challenges facing London see section 4 pages 51-57 of Future Proofing London).

Society

Inequality in London is getting worse and poverty is shifting to the suburbs, compared to a decade ago when poverty was more evenly dispersed. Whilst the number of wealthy households in inner London has increased by 203% between 1980 and 2013. Recent data shows a large proportion of overseas buyers for inner London homes, and a high proportion of residents in inner London with second homes.

Despite the growth in London's economy, deprivation levels remain high in much of east and south east London. In west and south west London there are higher levels of residents with managerial and professional jobs and higher income levels than east and south east London.

There has been greater growth in those seeking job seekers allowance in outer London than in inner London and the growth in unemployment rates have been much higher in east and outer east London.

These clear patterns of suburbanisation of the less wealthy coupled with a forecast for more modest growth in job opportunities (particularly in higher value sectors) in outer London, will mean that the increased polarisation of London's society is set to continue. The implications of this are likely to be

- greater social unrest impacting on stability of the city
- reduced social mobility and loss of human capital, which ultimately can limit economic growth and innovation
- poorer physical and social health as a greater section of society find it difficult to access social and cultural opportunities
- more volatile economic growth

(for further detail on housing challenges facing London see section 4 pages 58-64 of Future Proofing London).

Environment

Environmental changes as a result of both climate change and the Cities population growth have the ability to impact on London's economy and society.

There is a significant amount of residential, commercial and community premises and vital infrastructure that is within the Thames tidal floodplain. Climate change could lead to increases in sea levels which in turn will increase the risk of tidal flooding and increases in heavy rainfalls

leading to an increased risk of fluvial flooding. With the potential for significant loss of life and damage to property there will be a need to ensure that London invests appropriately in ensuring its flood defence infrastructure is fit for purpose.

Surface water flooding is also a key issue and likely to increase as development of the city continues and climate change impacts take hold. London is vulnerable to surface water flooding with 16 of London's boroughs identified in the top 20 districts in England as susceptible to surface water flooding.

London is one of the most water stressed cities in the world. With an increasing population the issues related to water scarcity are likely to increase. London will need to consider how it manages water demand downwards and or looks to secure water supplies in a different way, although it will be vital that any alternative water supplies are sourced sustainably.

London is susceptible to Urban Heat Island effect due to the high-rise form and density of development. Increasing summer temperatures have the potential to lead to a greater number of heat-related deaths, an increase in respiratory illness and a decline in labour productivity.

In addition to the environmental risks associated with climate change, air quality is another challenge that London faces as it continues to grow. The majority of pollution in London comes from transport and congestion. The additional growth that is expected in London will generate additional trips with a further impact on emissions. Air quality is a significant challenge for the city as poor air quality is harmful to human health and ultimately reduces the quality of life in London.

(for further detail on housing challenges facing London see section 4 pages 65-68 of Future Proofing London).

National Infrastructure Commission
1 Horse Guards Road
London
SW1A 2HQ

Balfour Beatty's submission to the National Infrastructure Commission inquiry into future investment in London's transport infrastructure

1. Introduction

Balfour Beatty is a leading international infrastructure group. With 20,000 employees across the UK, we provide innovative and efficient infrastructure that underpins our daily lives, supports communities and enables economic growth.

As this country's largest infrastructure Group, Balfour Beatty has more than 100 years of experience globally, and draws on the engineering skills and innovation of over 20,000 highly committed employees across the UK. Balfour Beatty finances, develops, delivers and maintains the increasingly complex infrastructure that underpins this country's daily life – in transportation, power and utility systems, social and commercial buildings. We are committed to London. From the Crossrail Liverpool Street and Whitechapel Station tunnels, to the £590 million Heathrow Terminal 2B project and the £300 million Aquatics Centre for the London Olympics, Wembley stadium, the Channel Tunnel Rail Link and soon the £416 million London 'Super Sewer' scheme, our expert teams have for many years helped to make the London landscape – both visible and invisible – what it is today, ensuring it can to continue to grow as one of the world's leading capital cities.

This note draws on our expertise to set out some of our thoughts on the key questions relating to the future of London's transport infrastructure.

London is facing unprecedented population growth, projected to reach 10 million by 2030 and more than 11 million by 2050¹. In order to support this growth, London's infrastructure will need continued investment to ensure it can maintain its status as a world class business location, competing with other top tier cities around the world and acting as a driver of the UK economy. Of course, significant transport investment is already underway in London, from Crossrail 1 to High Speed 2 and Thameslink, but more is needed. For example, much of London's commuter rail network is already operating at capacity in peak hours: additional capacity is required to tackle existing overcrowding and to support future growth.

Infrastructure requires vision, ongoing investment and consensus. Major projects take years to plan, build and develop; they are often disruptive to everyday life, especially in densely populated London, and their benefits are not felt within one electoral cycle or immediately understood by the public. The costs of disruption in London are high and the design of old-fashioned legacy systems often constrains options today. Prioritising and realising large projects requires political will. As much as possible, consensus is required for good infrastructure planning. The Olympic Park, where Balfour Beatty constructed the award-winning London 2012 Aquatics Centre, is a good example of what can be achieved with cross-party political support, while other worthwhile projects either do not happen or are slowed considerably if they do not have it.

¹ London Infrastructure Plan 2050, Mayor of London

In our view, there is a real need for clear long-term plans that have cross party support. In March 2015, the Mayor launched a long-term infrastructure plan², with the objective of setting out London's infrastructure needs and how to pay for them. As part of this, London's Infrastructure Delivery Board³ was established to bring together the interested parties in developing the programme of infrastructure works and advising on their deliverability, enabling the Mayor to seek to gain cross-party support. While Balfour Beatty welcomes the establishment of the Board, this body is still very new and has no statutory role, so it remains to be seen how effective it will be.

Balfour Beatty strongly supports investment in London's infrastructure. We believe that it is important not just to maintain London as a global city and to ensure that those that live and work there have access to the services they need, but that continued investment in the capital is vital to the UK economy as a whole. However, we would caution that investment in London or in the North of England should not be viewed as a 'zero sum game'. The two should be considered together for the good of the national economy, and both should see increased and sustained investment.

2. Responses to specific questions outlined in the Inquiry

What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

The challenges facing London are, in our view, mostly linked to its continued and rapid expansion. How to house the increasing population, how to transport people around the capital, and how to accommodate their other infrastructure needs including access to office space and business parks such as Tech City and the Advanced Business park, for example. There are of course many other social challenges, such as community cohesion, which we do not feel qualified to express views on. Here we outline a small number of the main challenges which we do have experience of:

- Delivering and maintaining infrastructure: London's transport infrastructure is already struggling to cope with current peak demand, a situation which will be further compounded by population growth and by plans including as High Speed 2 (HS2): the first phase of HS2 is due to open by 2026, which will mean large numbers of additional passengers to Euston station, where the Underground station is already at capacity. The opening of the second phase of HS2 in 2033 will place further burdens on routes to and from Euston.

A key economic challenge lies therefore in ensuring London's infrastructure is up to scratch. This is a twin challenge of planning and delivering new infrastructure; and ensuring the efficiency and maintenance of the city's existing infrastructure. The ability to rise to this challenge relies, in our view, on the level of forward planning and ability to adapt to changing circumstances and of course it requires regular and sufficient investment. Furthermore, infrastructure investment is most effective when developments are integrated from the initial vision, through the planning process all the way to implementation. Projects such as the Channel Tunnel Rail Link, the Jubilee line extension and Crossrail show what can be achieved when these requirements are all delivered.

While we understand that it is not part of the NIC's remit, we also believe that an early and final decision on aviation capacity in the South East needs to be taken. Of our closest competitors, Frankfurt has four runways; Schipol, six runways; and Charles de Gaulle has four runways. The continued delays are, we believe, damaging the UK's competitiveness.

² Ibid

³ <https://www.london.gov.uk/what-we-do/business-and-economy/better-infrastructure/london%E2%80%99s-infrastructure-delivery-board>

- Housing shortage: Currently, fewer than half of London's target of 42,000 homes are being built, and the numbers seem to be going in the wrong direction: there were around £4.5bn in orders for new housing construction in London in 2014/15, down 16% from the previous year⁴.

The housing shortage has a number of economic impacts. Low and middle income earners are being increasingly priced out of London. Increasing house prices are negatively impacting firms' ability to recruit and retain staff: the CBI/ CBRE London Business Survey⁵ found 32% of businesses saying that they are unable to offer flexible part-time employment due to the time/cost of the commute into London for employees who cannot afford to live locally. Similarly almost a third of firms said that employees are moving away from the local area and therefore having to leave their jobs as housing costs are too high. This is problem employers are facing now, but it is likely to get worse in future, especially for key workers such as nurses and teachers.

As some employees are forced to move further out of the capital due to rising housing costs, getting people from London's outer regions and from the wider country into London quickly and affordably is key. Transport connections are vital for commuters and Crossrail 2 will play an important role in facilitating these journeys.

Another point to consider if London is to deliver a greater amount of housing stock, is that density levels within the city may need to increase. London is not dense in comparison to places like Hong Kong for example. Discussions will be needed around the level of density that is acceptable and where this will take place.

Of course, the social angle of the housing shortage is significant. The most recent report on London poverty outlines that 1.2 million Londoners in poverty live in a working family, up 70% over the last decade⁶. The report highlights that, in a continuing trend demonstrated in the four previous editions, a key driver of poverty in London is the affordability of housing. With a shortage of affordable housing, the only option for low-income households is private renting, however, rents have increased by 19% in London in the last five years (compared to the 11% average across the country) resulting in an average private rent of £1,600 per month (more than double the £770 average in England)⁷. Indeed, average private sector rents in London are more than twice the national average for all property sizes⁸.

- Skills: London is a global city, a member of small elite group of cities that competes in an international market to attract highly skilled mobile workers in areas such as creative and media, financial services, IT software and global services. A well educated workforce and a deep skills base are crucial to enable it to maintain its position as a global city, and one which continues to see significant economic growth. However, every year India and China educate more than four million graduates, compared with just over 250,000 in the UK⁹. If something were to significantly reduce the flows of skilled immigrants from overseas into London that recent years have witnessed, this problem is likely to be compounded.

⁴ [ONS, New orders in the construction industry](#)

⁵ CBI/ CBRE London Business Survey 2015

⁶ New Policy Institute, London's Poverty Profile 2015, October 2015

⁷ Ibid

⁸ [Valuation Office Agency private rental market statistics](#)

⁹ Europe Economics, The Competitiveness of London – Future Challenges from Emerging Cities, 2008

In the infrastructure industry, designing, constructing, operating and maintaining the infrastructure which keeps London moving requires specialist skills and experience. In order to make sure we have the skilled labour necessary to build the transport networks, buildings, rail and runways and so on, it is important to ensure that London develops and retains the required level of skilled resource. Business needs confidence in the quality of the pipeline in order to ensure it has the skilled staff for some of the specialist roles in major projects. This is especially the case where new skills are required for innovative schemes.

Balfour Beatty welcomes and supports the government's ambitious plans to create 3 million more apprenticeships by 2020. We invest in apprenticeship programmes across a broad range of disciplines, employing over 150 apprentices each year in the UK in addition to the 320 currently under training in a diverse range of roles across the business¹⁰. We employ around 700 more young people on graduate and part-time higher education / degree schemes. However, we do not believe that the apprenticeship levy alone will be enough to meet the shortfall in skilled workers the infrastructure industry needs.

- Flooding: Of course, the impact of flooding from the Thames would be disastrous: not just in terms of the number of businesses and dwellings sited in London and the fact that London is the UK's largest centre of activity, but the Central Government district of Whitehall is also almost entirely within the Thames floodplain. Furthermore, the damage to London's transport infrastructure would be significant: much of the central area of the Tube network is based within the floodplain and 86 railway and underground stations, eight power stations, 1,000 electricity substations and 16 hospitals could be at risk¹¹.

However, assuming that the Thames Barrier continues to perform and that the Thames Estuary 2100 plan works, the other, less manageable threat is in the form of surface water for example, following prolonged heavy rainfall in the Thames catchment area. The amount of impermeable surface cover in London, such as concrete on pavements and buildings, means that rainfall runoff from the land into the drainage systems and rivers creates a build-up of water and potentially fluvial and surface water flooding. Drainage systems may have inadequate capacity or become blocked leading to further flooding. The more building there is and the less green space, the more pronounced this problem becomes. Climate change, with its projected extremes of weather and wetter winters, is likely to add to this and the City of London have identified surface water flooding as one of the most serious challenges London faces¹². Therefore robust and effective management strategies and flood resistance and resilience measures need to be put in place in order to mitigate the risks and opportunities for integration should be capitalised on. For example, the capacity of green space to reduce flood risk is rarely factored into the planning or design of parks.

- What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

Balfour Beatty's priorities for strategic investment options for London are:

- A. Crossrail 2: Crossrail 1 will deliver a 10% increase in transport capacity east to west. However, it will not address the issues of congestion levels on north-south tube and rail lines

¹⁰ <http://www.balfourbeatty.com/index.asp?pageid=364>

¹¹ The Environment Agency's "at risk" list, 2015

¹² <https://www.cityoflondon.gov.uk/services/environment-and-planning/sustainability/climate-change/Pages/surface-water-flood-risk.aspx>

and the need for significant additional capacity due to projected population growth. We believe that a new north-south line linking Wimbledon to Hackney across central London and extending into the suburbs, linking in with London Underground, London Overground, Crossrail 1, National Rail, High Speed 1, High Speed 2, London Trams and international rail services, should be approved as a matter of urgency. The urgency relates both to the need to address the two problems outlined above, but also to the need not to lose the skills and knowledge gained from Crossrail 1 due to a time lag between the two projects. The priority, in our view, is to plan the new rail line in conjunction with housing and regeneration needs.

Firm decisions on the route, a construction timetable and a credible funding package need to be made as soon as possible. We furthermore believe that additional Crossrail lines could follow.

- A. London Underground: As well as developing the new Crossrail 2 line, line upgrades and station works are still necessary to maintain a resilient underground system. We agree with Transport for London that, even with the new capacity the Tube upgrade is bringing online, it will not be enough to meet London's future needs. Investment must continue across the wider tube network: we must ensure that journeys are seamless across the whole network. There will be little point having a good quality, fast Crossrail 2 if the onward tube connections are prone to signal failure, over-crowding and delays.

Furthermore, the areas that are opened up by Crossrail 1 and the potential Crossrail 2 will mean that more people from those areas access the Underground for their onward journeys. Constant upgrades and developments must therefore be factored in as a priority.

- B. New East London river crossings: We agree with the Centre for London report¹³ that there is a need to address the severe lack of crossing capacity on the East Thames. There are three crossings to the east of Tower Bridge, compared to 16 road crossings on the 20 miles of the river west of Tower Bridge. All three of the eastern crossings are regularly congested. However, the population of East London is forecast to increase by 600,000 in the period to 2031¹⁴, and this area of the capital is a key priority for regeneration, housing and jobs.

We support a minimum of two bridges at Gallions Reach, which would connect Thamesmead with Royal Docks; and at Belvedere, which would connect north Bexley with Havering. These options were the two identified by a recent TfL consultation which received 7,500 responses, 90% of which were in favour of new river crossings in east London. The two new crossings would form part of a package alongside the Silvertown tunnel, which would connect the Greenwich Peninsula with the Royal Docks and would play a key role in supporting the population and employment growth forecast for London.

Balfour Beatty believes that the success of the toll bridge at Dartford suggests new projects could be paid for with private finance and money recouped from those using the crossings.

- C. An orbital underground ring road: This would relieve congestion around Tower Bridge and Old Street, as well as the Old Kent Road, the A40 around Acton and the A503 at Woodberry Down.

¹³ Centre for London, Linking London: A New Generation of River Crossings to Revitalise the East Thames, October 2014

¹⁴ TfL, 2015

There are also other points to consider in relation to improving London's future infrastructure, for example:

- One of our observations from our work elsewhere in the world is that, when large-scale infrastructure projects are delivered in this country, opportunities are often missed for infrastructure integration. For example, the Crossrail tunnels that are currently being built could have included broadband fibre, but will not because decisions were not made at the right time. We need to become better at considering all future infrastructure needs upfront at the inception of major projects.
- It should not all be about new infrastructure. Work is also needed to improve the capital's road network and ensure that it is fit for purpose for the projected population increase. Congested roads are a strain on the economy and the environment, impacting London's competitiveness and Londoners' overall quality of life. In our view, smart technology is needed to deal with bottlenecks at traffic junctions for example, including some of the Dynamic Traffic Forecasting methods being used in Barcelona, digital road signs, junction technology and encouraging sat-nav companies to give drivers better real time information. We support TfL's £4 billion Road Modernisation Plan and believe that it could potentially go even further, with an extension to the congestion zone, or an amended charging regime where costs vary based on those roads and times of day where congestion is worst.

3. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

- Building on the Crossrail 1 model: Decisions about public expenditure on London's infrastructure investment are often not taken in such a way that the costs, or at least some of them, are borne by the people who benefit. However it is estimated that local funding sources could meet at least half of the costs of Crossrail 2¹⁵, in part by building on the Crossrail 1 model. This would include ideas such as increasing fares and building on the idea of the Olympic precept for Council tax payers. While these options may be politically unpopular, it is our view that they should be considered in line with the principle that those who benefit should carry some of the burden for the funding. It is in cases such as these that political consensus around future infrastructure priorities is important to achieve.

The Crossrail funding model is interesting in that it brings together a number of sources of funding and financing. Most notably in terms of alternative funding mechanisms it includes a supplementary business rate on larger London businesses of two pence in the pound for approximately the next 30 years. This approach was largely welcomed by London business, which is broadly supportive of the principle that tax and spending decisions should be better aligned. We support work that has been done by PWC¹⁶ and others on demonstrating how a continuation of the Business Rate Supplement and the application of a Mayoral Community Infrastructure Levy could meet 21% of the costs of Crossrail 2. The benefit of these methods having been used in Crossrail 1 lies in the fact that the principle has been established and in the learnings that can be taken from the operation of the schemes.

- Land value uplift / Tax Increment Financing (TIF): Infrastructure investments decisions need to consider all their economic returns from the outset, for example, by capturing increased land values around schemes due to improved transport connections. TIF can enable local

¹⁵ Michele Dix, TfL presentation on Crossrail 2, June 2015

http://www.newlondonarchitecture.org/docs/michle_dix--transport_for_london-1.pdf

¹⁶ PWC, Crossrail 2 Funding and Financing Study, November 2014

authorities to raise funds for infrastructure improvements which will increase economic activity in the future. It has been widely and successfully used in the US and in Hong Kong for many years and is beginning to be used in the UK. One of the conclusions from PWC's analysis is that:

"many land and property owners who have benefited most from the project are not making a commensurate contribution to the project costs"¹⁷.

Crossrail 1 is projected to add more than £5 billion¹⁸ to property values along its route, only a fraction of which is being captured to support the cost of the line. More should be captured in plans for Crossrail 2, which would reduce reliance on national taxation. This is something that could and should be addressed in advance of Crossrail 2.

- Dividing the burden between interested parties: Subdividing major projects into smaller sections with bespoke financing/funding arrangements. For example, the bulk of the project, for example the tunnelling could be simplified and funded centrally, but station development and other elements could be funded and justified separately by local authorities and/or private sector developers.
- Private sector investment in infrastructure: Although there are Pension and Infrastructure Funds for example, which could invest in London infrastructure, their investments are subject to market and policy risk. They require policy certainty from government in the form of clear up-front statements of government policy in key strategic areas, ideally, government guarantees, better coordination within government and rapid implementation of the detailed policy frameworks which can provide the certainty and longevity which the private sector needs to make the business case for infrastructure investment. While this is unlikely to be a viable option for Crossrail 2, due to the size of the scheme, it is possible that private investment could be used for other London infrastructure projects.

Much of the investment in UK infrastructure is undertaken by international businesses which have a choice of markets and projects for their scarce capital, and they will naturally choose those jurisdictions with effective policy frameworks which provide certainty over the longer term over jurisdictions which do not.

Balfour Beatty believes that commitments to long-term infrastructure plans would reduce the cost of delivering infrastructure in London and elsewhere in the country. Longer-term plans teamed with the certainty that they will be followed through would also enable the whole industry to ensure the right resources – both in terms of skills and assets - are in place to deliver. Without this certainty, for example, providers cannot start training the workers needed in the future or ensure their supply chains are in place.

Contact

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¹⁷ Ibid

¹⁸ GVA, Crossrail Property Impact Study, October 2012

CALL FOR EVIDENCE

Further to the call to Evidence for the National Infrastructure Commission we have pleasure in detailing some issues and points relating to the national challenges.

1. Improving connectivity between cities in the North of England

Recommendations for cost effective infrastructure investment

Improve the local transport infrastructure to facilitate cross-country links such as Northern Hub

One way to increase employment, housing and enterprise growth will be to concentrate on local transport improvements to facilitate cross county links such as the Northern Hub solution.

Improvements in local transport links and high quality infrastructure are essential for the North of England as they will not only benefit the communities that live there, but also those visiting / commuting to the region which is vital for the local economy.

This focus requires immediate action with full and proper collaboration across all parties including the deliverers.

Provide Superfast Broadband

Superfast broadband makes a positive impact on national and local economies. For the North of England, an area of improvement that will assist in resolving many issues is the improvement in connectivity of IT by supplying super-fast broadband (400MB+) across all the Northern cities.

Faster broadband allows a workforce to work more flexibly which can lead to greater productivity and reduced travel meaning time and money saved.

This solution is relatively low in cost and requires future proofing for at least five to ten years.

Priority early-phase investment

Improvements between Liverpool to Manchester and Leeds, then Teesside to Newcastle

As Sir David Higgins said *'Improving connectivity is vital, if Britain is to compete in the knowledge economy in which this country has a competitive advantage, but in which ease of travel is an essential element'*.

A main focus should be made, firstly, on the Liverpool to Manchester and Leeds connectivity in highways, rail and water.



This should then be followed into Teesside and Newcastle.

The governance of delivering this infrastructure and its subsequent growth needs careful consideration as the devolvement of power and funds to a region is not always cost effective.

The Northern Powerhouse needs to evolve in the same way as TfL - with close collaboration with all stakeholders involved. This will prove very effective, as it has been for London.

Whether the same can be said for the other local authorities and LEPs is questionable, therefore, effective and efficient business cases need to be agreed with monitored results and programmes.

Effective governance

Considerations for finance and funding

The funding of schemes and developments should be considered to prioritise and obtain a greater input for those that will reap the most benefit eg Crossrail 1 and business investment with developers for flood protection.

Many opportunities can be considered within a portfolio finance model with funding and support from organisations outside of the public sector. This is something innovative but difficult to obtain without buy-in from authorities that tend to revert to traditional procurement methodology.

2. London's transport infrastructure

The challenges facing London and recommendations

London is one of the most rapidly growing and congested cities in World. Hundreds of thousands of people travel to and from London for work via overcrowded networks because they have to.



A question to consider: *'Is the relentless growth in London really viable for the future?'* And *'How can this problem be alleviated?'*

Our recommendation, to overcome the infrastructure capacity challenge faced by London, is to invest heavily into adjacent regions and towns surrounding the Capital. If these areas become better and more efficiently connected, accessible and attractive, the problems faced by London will be reduced as fewer people are forced to rely on the London network.

Strategic options for future investment in large-scale transport infrastructure

Short-term solutions

In the short term we need to:

- Enable high speed connectivity and continue to improve rail capacity for the inevitable commuter journeys
- Consider how to develop 'metro type' services - improving signalling and platform usage while bypassing loops in the service
- Provide 24-hour transport services to the rail system to give passengers the ability to change their patterns of travel without any fears of accessibility to and from their place of work. Essentially dissolving the rush hour.
- Embrace the use of applications including UBER within the road network, to obtain increased usage of the highways, relieving strain on infrastructure and transport networks.

Medium-term solutions

In the medium term we need to:

- Resolve the airport aviation issue and ensure we put in place the new runways required.
- Prepare for the future: The introduction of driverless cars is inevitable and we need to anticipate the impact of this mode of transport relative to existing forms. We must therefore develop a transport strategy that combines mass transit with electric and driverless vehicles to ensure our infrastructure is prepared for future innovation.

Long-term solutions

In the long term we must:

- Consider and action infrastructure finance through Value Capture and learn from other past examples of success not only in the UK but from Europe and the US.
- Consider the sharing of knowledge with other Government deliverers and customers throughout Europe and the US. This needs greater emphasis.
- Develop best practice. From a BAM perspective, our nine other international Group companies give a huge depth of learning and best practice which can be shared with others to drive continual improvement in the UK's infrastructure. This needs to be captured to benefit business practices
- Joining together of regulators, especially in the South East, but also across the country, in a forum to give traction and commonality of thinking would provide increased best practice and value savings
- Respond to future plans. The London 2050 Infrastructure Plan includes a wider audience such as Manchester and the outlying regions. This needs positive collaboration and leadership.
- More Mayoral control would bring benefits as it has to date in London – especially in the housing and asset support sectors

Finally, the use of land in the London area and regions needs some firm leadership and direction to spur development and investment. A Mayoral lead in this, again, would be benefit, reducing the negativity realised from Local Authorities.

Opportunities to increase benefits of Crossrail 2

An option for London to consider is whether to build a new metro system, supporting the existing one and complementing the connections that already exist.

CRL1 and 2 would be part of this but further long-term new systems will need to be planned if the growth becomes the 10m as predicted.

On Crossrail 2 we need to be certain of the problem that is to be solved before deciding on the solution. An agreement on what to spend and what must be done to solve the problem should occur before collaborating to achieve the outcomes.

Initial arrangements must be made that meet the budget before any decisions are made on which project to build. Issues such as station locations, tunnel alignment and conservative settlement criteria all have disproportionate cost impacts. These elements need thorough and open discussion with all stakeholders.

Options for the funding, financing and delivery of large-scale transport infrastructure improvements in London

High Speed 2 (HS2) – using Euston not Old Oak Common

Other issues in the London sector are the immediate provision and development of Old Oak Common with the investment and expansion that will follow using the Greenwich and King's Cross models. Simultaneously, HS2 must enter central London at Euston and the development of this facility needs urgent and immediate commitment. Old Oak Common as a terminal to HS2 is not a solution, however,



Euston certainly is. Connectivity to HS2 from Heathrow and other potential outlying areas including Crewe requires immediate commitment and collaboration between all stakeholders in order to make HS2 successful.

Lessons learned which can be applied to London

Sharing knowledge and information is crucial to long-term improvements – building on the success of the Olympic and TfL delivery models.

It is essential to learn from our previous experience and move away from employing the services of advisers with no real incentives. We must also move away from the use of bespoke contracts when we can make positive use of past success such as the Olympic Delivery model and programmes employed by TfL especially in the streets section.

Using Building Information Modelling (BIM) to streamline delivery programmes

The entire 'Process of Delivery' of projects and all 'Programmes of Work' need considering so that construction is fully considered through from procurement to maintenance using BIM to its fullest capacity. We need to discover efficiency of procurement, construction and long-term maintenance that delivers value to customers.

BRITISH PROPERTY FEDERATION RESPONSE TO NATIONAL INFRASTRUCTURE COMMISSION



The BPF represents companies owning, managing and investing in commercial real estate. This includes a broad range of businesses comprising commercial property owners and developers, financial institutions and pension funds, corporate landlords and residential landlords, as well as all those professions that support the industry.

Introduction

1. We welcome the opportunity to respond to the National Infrastructure Commission's call for evidence. Commercial real estate is a key component of the UK's infrastructure, providing the homes, offices, health premises and distribution networks we need for the country to thrive. Infrastructure is crucial to attracting the investment needed to regenerate the UK's town and cities, and the establishment of the Commission is a welcome step in ensuring swift, coordinated decisions over important projects which will ensure clarity and certainty for investors, business communities and local residents.
2. The BPF has a wide range of members with diverse property and development interests across the country. We have therefore kept our response to high level points rather than recommending individual projects or schemes be prioritised.

London's transport infrastructure

What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

3. London is in a remarkable period of growth, with its population topping 8.6m earlier this year – the highest since its 1939 peak. With this projected to reach 11m by 2050, there will be unprecedented pressure on existing infrastructure. The required infrastructure spend for the capital has been estimated at £1.3 trillion to 2050¹, and finding the necessary funding will present a huge challenge.

Housing

4. The availability and affordability of housing likewise poses a major challenge to London and its inhabitants, and this will continue and potentially worsen with predicted population growth. This will affect a wide range of people, from students to the elderly population. The capital has in recent times led the way in recognising the opportunities to add to housing supply by providing different models of housing and a variety of tenures, and this is warmly welcomed.
5. For example, the Build to Rent sector has taken time to reach a critical mass but is making good progress at adding to housing supply with 7,000 units in the London development pipeline. Whilst central Government has been very supportive in reshaping planning guidance to reflect this new phenomenon of pension fund investment in large-scale rental housing, it has taken time to inform and educate local authority planning officers and politicians about this sector and we would urge all involved to recognise the benefits of attracting investment to areas in this way.
6. There is also an excellent opportunity to plan housing delivery in London hand-in-hand with infrastructure. For example, land freed-up by Network Rail and Transport for London (TfL) is proving attractive for build-to-

¹ 'The Cost of London's Long-Term Infrastructure' Arup, July 2014

BRITISH PROPERTY FEDERATION RESPONSE TO NATIONAL INFRASTRUCTURE COMMISSION



rent development, providing high density quality rental accommodation, near to transport modes, for key workers and other employees. TfL have gone so far as to look at Joint Ventures that will allow them to be part-owners of build-to-rent schemes, and therefore generate income to help fund their other work.

Health services

7. With a rising population, the strain on the city's health services will become increasingly apparent. Already nearly two thirds of London's general practices perform worse than the England average in terms of overall patient satisfaction; three quarters are in need of rebuild or repair; and a third is not compliant with the Disability Discrimination Act². There is a significant amount of private capital available from investors ready to work with the public sector to invest in new premises, but this will require long-term strategic thinking from Clinical Commissioning Groups (CCGs) which are only beginning to adjust to their new roles, and a commitment from Government to increase the revenue funding to allow for improved GP premises.
8. London is likely to face care-related challenges presented by the ageing population over the next twenty years. While the average population of London is younger than the national average, the number of people aged over 65 is set to nearly double by 2029³. Given that there is currently only 28 care beds per 1,000 people aged over 65 in the Greater London area and only 1 bed per 1,000 people aged over 65 in the development pipeline⁴, coupled with the fact that people will on average spend two and a half years of their lives in a care home, this is likely to lead to a severe shortage of suitable residential care homes for the city's population.

Town centres

9. As is the case across the country, the role of London's town centres has changed in recent years. There has been a restructuring of retail habits with online shopping becoming increasingly popular; and in some areas there is a surplus or the wrong type of office space.
10. Rather than allowing high streets to fall into decline, there are opportunities to develop residential growth on high streets; to create affordable and flexible new workplaces (for example through the use of pop-ups); and to ensure visiting town centres becomes a positive and attractive experience. Indeed, some London boroughs are already taking these opportunities and we would encourage the Commission to take into account these examples⁵.

What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

11. Land assembly remains a key challenge in the delivery of these projects, as ownership is often disparate. With much of the land in the hands of local authorities and other public sector bodies such as TfL or Network Rail, they have a key role to play in delivery. Structures such as Development Corporations have proved successful in bringing together land and the key players to coordinate processes. For example, 70% of the land involved in the Old Oak Common HS2 and Crossrail station scheme is in the ownership of public sector bodies and is being brought together in the Old Oak Common Park Royal Development Corporation.

² 'Better Health for London' London Health Commission, October 2014

³ 'Population Growth and Ageing' London Medicine & Healthcare, 2013

⁴ 'UK Healthcare Development Opportunities 2015' Knight Frank, December 2015

⁵ 'Building on Success – London's Town Centres' London Councils, 2015

BRITISH PROPERTY FEDERATION RESPONSE TO NATIONAL INFRASTRUCTURE COMMISSION



12. Some of the most innovative delivery we see is where our members work in partnership with local government through joint ventures and other structures, where public land is invested as part of the partnership arrangement. These can offer local councils valuable income from, and ongoing controls of their public land rather than outright sale to the highest bidder for that land. But many councils remain nervous of best value rules and we believe there needs to be clearer guidance on what is allowed.

- **What innovative funding mechanisms could be considered to support delivery of key schemes?**

13. London in particular has funded the delivery of schemes through a tax on commercial real estate, with Crossrail partly funded by a business rates supplement introduced in 2010, s106 obligations and by the mayoral Community Infrastructure Levy introduced in 2012. Mechanisms such as these can be useful, but have an impact on the viability of schemes and we would be concerned that solely focusing on them and under-utilising innovative mechanisms such as Tax Increment Financing (TIF) would stall delivery.

14. TIF allows local authorities to borrow against future business rates and reinvest this back into local regeneration schemes. TIF-style models have been utilised with great success across the country, such as to partly finance the Nine Elms extension of the Northern Line to Battersea Power Station Nine Elms extension of the Northern Line to Battersea Power station, and in Birmingham's Enterprise Zone on the Paradise Circus scheme, and there are lessons to be learnt from its application in these examples. We would welcome further discussions with the Commission on these examples.

15. The London Finance Commission Report 'Raising the Capital' included a number of comprehensive proposals on this, many of which could be revisited and would allow growth to be further unlocked.

16. We would be pleased to further discuss or amplify any points raised in our response.

Rachel Campbell
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British Property Federation
St Albans House
57-59 Haymarket
London SW1Y 4QX

[email and telephone
number redacted]

Community and Economic Development

Date: 7 January 2016
Direct dial: [telephone number redacted]
Email: [email redacted]
Please ask for: Greg Macdonald

National Infrastructure Commission
1 Horse Guards Road
London
SW1A 2HQ

Dear Lord Adonis

Call for evidence

I am writing to you on behalf of the Broxbourne Borough Council in response to your recent call for evidence published in November 2015.

Firstly, I would like to thank you for the opportunity to engage in this critical conversation regarding the future growth and prosperity of the nation. Broxbourne is an ambitious Borough that has significant plans for improving prosperity for residents and businesses and, to this end, we are very keen to work with the NIC to turn our ambition into reality. Ambition Broxbourne is the Borough's economic development strategy and mantra that drives partnership working to secure inward investment, nurture business growth, generate quality places and ensure that residents and workers have the skills the economy needs to thrive now and in the future.

Broxbourne Borough Council is a member of both the West Anglia Routes Group (WARG) and the London Stansted Cambridge Consortium, which are associations of public and private sector organisations from along the routes running from Liverpool Street and Stratford through north London into Essex, Hertfordshire and Cambridgeshire. These organisations are working together to promote economic growth including securing timely infrastructure investments. The Council is also represented in the West Anglia Taskforce Working Group. The West Anglia Taskforce will compile an evidence base to support rail infrastructure investment along the London Stansted Cambridge corridor and will report its initial findings to the Government in the summer of 2016.

The Council is currently developing its Local Plan which will set out how Broxbourne will grow and develop to become a more desirable and prosperous place to live, work and visit. It will be a development strategy for the next 15 years. The Plan will provide for homes, jobs, shops, transport and infrastructure - all set alongside the long term protection and improvement of our Green Belt, parks, open spaces and built heritage. An extensive evidence base underpins the preparation of the Local Plan. This has resulted in a detailed assessment of the levels of need within the Borough, counterbalanced against the capacity of the Borough to accommodate growth.

The Borough Council strongly supports the current Crossrail 2 proposals as part of Ambition Broxbourne. In particular, we recognise the critical role it will play in driving local and strategic economic growth and prosperity over the coming years, thereby ensuring that the economy remains competitive and able to nurture and sustain healthy and productive communities. This support has also been confirmed by the Ambition Broxbourne Economic Development Board; a cross sector grouping overseeing and driving the economic development plans for the Borough.

Broxbourne Council is a strong supporter of the regional route of Crossrail 2 because it will add capacity across the network, relieve pressure on key lines, and improve connectivity into and through London, whilst also supporting growth in jobs and homes and regeneration along the London Stansted Cambridge corridor. The Council also strongly supports the proposed provision for four tracking of all or part of the line between Tottenham Hale and Broxbourne to accommodate increasing demand for local services which would bring many benefits and opportunities to the Borough's residents and businesses.

In particular the Council has written separately to the Crossrail 2 team requesting an early opportunity to discuss any available designs in more detail with regard to:

- Broxbourne's ambition of having a new railway station in Turnford between Cheshunt and Broxbourne to support the creation of a new Borough Centre at Brookfield;
- Better connectivity between key strategic development sites and the existing and proposed railway infrastructure including, for example, the proposed commercial development at Park Plaza and the Southbury Loop railway line;
- Programme of level crossing closures;
- Details of stable location near Broxbourne;
- Future of brick bridge over the railway near to Broxbourne Railway Station;
- Proposals for upgrading Waltham Cross, Cheshunt and Broxbourne stations;
- The possibility of developing a more permanent arrangement/local project office to facilitate closer joint working; and
- Financial programming of Crossrail 2

In addition, there is a need for significant improvements to the A10 in supporting growth in housing and employment especially with regards to the planned expansion of Brookfield (to create a new Borough Centre) and Park Plaza (a significant employment allocation). The initial phase of transport modelling is now complete and it was found that there are many capacity constraints at the following locations:

- A10 Great Cambridge Road/ Church Lane
- A10 Great Cambridge Road/ College Road
- A10 Great Cambridge Road/ A121 Winston Churchill Way/ B198 Lieutenant Ellis Way
- M25 J25/ A10 Great Cambridge Road
- A10 Great Cambridge Road/ A1055 Bullsmoor Lane

Further transport modelling is underway to provide more detail and help develop proposals to remedy these issues. Investment in the A10 will also support current planned investment in junction 25 of the M25, help address congestion issues in Enfield, support growth further

north along the A10 corridor in East Hertfordshire District and improve connectivity with Cambridge (with regards to growth in the Life Sciences sector) and Stansted Airport. Therefore we consider that it is critical that these issues and associated improvements are recognised and supported through the NIC. The Council would welcome continued engagement with TfL, Network Rail, Highways England, the National Infrastructure Commission and other key stakeholders to ensure that Crossrail 2 and other strategic infrastructure investment can maximise the potential benefits both locally and nationally.

Overleaf is the Council's more specific response to your call for evidence under your published questions but specific to us.

In conclusion, we are an ambitious Borough and strongly believe that, like other areas within London's hinterland, we play a critical role in its success and have a vital role to play in London's future to ensure it remains a global core city generating and driving national and international economic prosperity. We would be more than happy to host a meeting of the Commission to spotlight how key investments, such as Crossrail 2, will unlock the potential of Broxbourne for the benefit of London and the nation.

If you require further information, or wish to discuss any of the feedback, then please contact Alf Cuffaro on 01992 785539 / alf.cuffaro@broxbourne.gov.uk.

Yours sincerely

[signature redacted]

Greg Macdonald
Director of Community and Economic Development

1. What are the major economic and social challenges facing the Borough of Broxbourne over the next two to three decades?

Housing

The Council has assessed a need for 419 new homes per annum between 2014 and 2031, a total of 7,123 homes. New homes built between 2014 and 2015 would be discounted off this figure but the total need would be around 2,000 new homes in excess of the provision that the Council was planning to provide for prior to the publication of the Government's 2015 household projections. Prior to these projections having been produced, the Council was already faced with making very difficult choices about Green Belt developments. Nevertheless, further review of the Green Belt and of urban capacity has identified sites that could accommodate approximately 6,000 new homes in total. That is the number of new homes that the Council is currently proposing to consult on within the draft Local Plan. This would increase the number of new homes within Broxbourne from 39,800 (2014) to approximately 46,000 in 2031. 6,000 new homes falls short of the identified need and an option could be to meet the full need for in excess of 7,000 new homes. However, at this stage, the Council believes that to meet the need in full would have an unacceptable impact on the aim and purposes of the Green Belt as well as on the ability of Broxbourne's infrastructure to cope. We consider that the redevelopment of stations along the Crossrail 2 route will provide opportunities to innovate and explore new ways of meeting and exceeding this housing requirement.

Population

The current population of the Borough is approximately 96,500. In 2031, the Government predicts that the population will have increased to 109,100. This will be as a result of natural growth in the resident population and a net increase of people moving into the Borough, primarily from London. The Government's population projection is consistent with the number of new homes that the Council is planning for over the Local Plan period.

Employment

It is not proposed that the allocation of land for employment will follow a "needs" based approach. The Council considers that the proposed employment sites should be promoted to maximise the opportunities to meet the employment objective and to diversify the employment base of the Borough. The protection of existing employment areas and the promotion of new ones align closely with Ambition Broxbourne, the Council's economic development strategy, and with the Strategic Economic Plan of the Hertfordshire Local Enterprise Partnership. It is estimated that the new employment opportunities identified to date would result in approximately 7,500 new jobs being created within the Local Plan period. There is a tension between housing and employment growth that we are currently reviewing through the Local Plan with the potential release of strategic sites within the greenbelt.

Shopping and Leisure

The Council has a long standing ambition to reduce the unsustainable leakage of retail expenditure outside the Borough and to provide its residents with better access to high quality shops. The Council's retail needs assessment identifies capacity for between 9,400 m² net and 13,200 m² net new convenience goods floorspace to 2030. It also identifies capacity for between 25,000 m² and 45,000 m² net new comparison goods floorspace to 2030. The proposal for a new Borough Centre at Brookfield will provide additional space.

Schools

Hertfordshire County Council has identified a need for significantly more primary and secondary school floorspace to be provided by 2031. The potential to expand existing schools has been fully assessed and there still remains a need for one new secondary school and up to eight new primary schools within the Local Plan period.

Health

At this stage, a need for two new/extended health care facilities within the Local Plan period has been identified and it is intended that provision will be made accordingly

Green Belt Releases

Urban and brownfield sites cannot meet all of the development and infrastructure needs and provide for sufficient opportunities for the future development of the borough. The nature and location of town centres and railway stations limit the scope for significant additional development in and around such locations without major redevelopment that is not considered practicable or desirable within the lifetime of this Local Plan. Intensification of existing residential areas would adversely impact on the suburban character of much of the Borough and would not provide the means to ensure the delivery of appropriate infrastructure to support development. The potential to reuse employment land for housing is limited given the Council's aspirations and objectives to promote economic growth and development. Alternative options have been carefully considered and in Broxbourne the Council has concluded that planning for the Borough's development needs can only be achieved through the strategic release of some Green Belt land.

Broxbourne currently has some 3,300 Hectares of Metropolitan Green Belt. The Council has prepared a Strategic Green Belt Review that divides the borough into eleven broad areas and looks at how these areas perform in terms of the aim and purposes of the Green Belt. This assessment has highlighted five broad areas that have very limited scope to accommodate development but also identifies six areas that have warranted further consideration in terms of their ability and capacity to accommodate additional development and associated infrastructure. These areas are: the lands between Hoddesdon and the A10; Brookfield and Cheshunt Park; Goffs Oak and Rosedale; Bury Green; the southern A10 Corridor; and lands between Wormley and the A10.

Examination of these areas has resulted in proposals being made to allocate lands to facilitate a number of strategic and edge of urban developments.

Town Centres and the Retail Hierarchy

The borough's town centres remain the hub of community life and their regeneration and improvement are priorities for the Council.

The Hoddesdon Town Centre Strategy was published in 2010 and has been the framework for the redevelopment of the Tower Centre and a range of development, improvement and promotional projects over the last five years. Successive annual actions plans have rolled forward those projects and a full review of the strategy is now proposed. It is anticipated that the following will form the basis of that strategy:

- Further public realm improvements in the High Street and beyond;
- The promotion of small, scale mixed use development sites;
- A gateway development into the town centre at and around Scania House;
- The provision of a mix of day and evening activities;
- Improved access; and
- Protection and enhancement of historic character.

The Waltham Cross Town Centre Strategy was published earlier in 2015. The key projects to be promoted through the Local Plan are:

- Redevelopment of the northern High Street for a mixed use residential and retail development. This would involve the relocation of Homebase and Wickes to Park Plaza North;
- Improved vehicle access through the northern High Street and a range of public realm improvements throughout the High Street and beyond;
- Additional homes in and around the town centre;

Retail Opportunities and the Retail Hierarchy

Opportunities for major new retail and leisure developments to meet the borough's needs within its existing town centres have been examined. However, the only clear opportunity is through the redevelopment of the northern High Street in Waltham Cross. To date, the site has received very limited interest from retailers to the extent that the Town Centre Strategy now proposes a mixed use approach with more limited retail content, an approach that will be reflected in the Local Plan. The only major opportunity for significant new retailing in the borough is at Brookfield. Given the increased retail content and the mix of uses proposed at Brookfield, the Local Plan will include a retail hierarchy that places Brookfield on the same level as Hoddesdon and Waltham Cross town centres. Floorspace levels and content of the centre will, however, be strictly controlled to ensure that it complements the borough's existing centres. Cheshunt Old Pond will remain as a District Centre and a range of neighbourhood and local centres will also be identified within the hierarchy.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in the Borough of Broxbourne - on road, and rail including, but not limited to Crossrail 2?

Transport Infrastructure

The Council is aware that new development will add more pressure to roads and rail services. The only significant new road planned within the Local Plan will be a new link from the existing Brookfield Centre to the Turnford Interchange on the A10. The emphasis will therefore be on managing traffic growth, improving the existing highway network - with a particular focus on the A10 - and on enabling local people to use alternative forms of transport. The Council is particularly supportive of proposals to 4-track the West Anglia mainline and to deliver Crossrail 2 into the Borough to increase rail capacity. As a result the Local Plan is proposing and supporting a range of transport projects as follows:

Road

- Additional junction capacity at the M25 junction 25 through the provision of new on and off slip-roads;
- Improvements to traffic flow through the A10 roundabout linking Lieutenant Ellis Way and Winston Churchill Way;
- The consideration of additional lanes on the A10, as far as possible within the confines of the highway boundary;
- Improvements to traffic flow through the signalized junctions with the A10 at Church Lane and College Road. The future role of these junctions within the wider road network will be examined;
- The northern extension of Brookfield Lane West from the Brookfield Retail Park to the Turnford Interchange on the A10;
- Improvements to the Sun and Hertford Road roundabouts in Hoddesdon;

Rail

- The implementation of Crossrail 2, a new dedicated rail link from Broxbourne to south London. The Council is currently supporting Broxbourne Station as the northern terminus for the majority of Crossrail 2 services;
- The construction of a new station between Cheshunt and Broxbourne at Turnford to support the creation of a new Borough Centre at Brookfield
- Four tracking of the West Anglia mainline to Stanstead Airport;
- Safeguarding of and continued improvements to stations in the borough - including longer platforms, additional parking and improved access;
- Better connectivity between key strategic development sites and the existing and proposed railway infrastructure including, for example, the proposed commercial development at Park Plaza and the Southbury Loop railway line;
- The extension of Oyster card services;
- The replacement of level crossings with appropriate alternatives.

Bus

- The protection of viable bus services throughout the borough;
- Expansion of Waltham Cross bus station in its current location;
- Creation of a new bus station at Brookfield;
- New bus service between High Leigh, Hoddesdon and Broxbourne Station;
- Reinstated bus service to Park Plaza, Waltham Cross.

Walking and Cycling

- Pedestrian and cycle connection from Park Plaza to Waltham Cross town centre;
- Improvements to the New River path including cycle use;
- Promotion of additional off road footpath and cycle links through the borough and connect to and through new developments;
- Greater access to the countryside for pedestrians, cyclists and horse riders
- Promotion of a walking and cycling strategy

The Council will also support transport projects outside the borough where they will ease congestion and provide additional services to residents and businesses within the borough.

Transport related priorities and potential impact

An efficient transport network for all modes of travel will be critical to unlock the full potential of Crossrail 2. In Broxbourne the main priorities are the delivery of Crossrail 2 and improving the capacity along the A10 and its junctions south of the Turnford interchange. Consideration will need to be given to connecting Crossrail 2 to the A10 and the M25 and associated key development sites and existing and proposed communities. In Waltham Cross this presents a particular challenge/ opportunity given that access from the station to the M25 is very problematic and convoluted even though it sits right next to the motorway; a more direct link solution could also address current congestion issues in Enfield.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Opportunities for increased benefits:

- Extend the northern terminus beyond Broxbourne Station
- Construct a new station between Cheshunt and Broxbourne at Turnford to support the creation of a new Borough Centre at Brookfield. Hertfordshire County Council and Broxbourne Borough Council are working together on a business case for the new station.
- Early delivery of four tracking of the West Anglia mainline north of Tottenham Hale to bring forward by a decade much needed new homes and employment opportunities for the region.
- Better connectivity between key strategic development sites and the existing and proposed railway infrastructure including, for example, the proposed commercial development at Park Plaza and the Southbury Loop railway line;
- Improve access to and reduce congestion around stations and improve links to A10 and M25

Opportunities for reducing costs:

- Comprehensive and regular consultations with all stakeholders, especially the key planning authorities and landowners , at each stage of the project
- Programme of level crossing closures to allow for the four-tracking of the West Anglia Main Line
- Reliable and up to date land surveys

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

Possible funding opportunities:

- Recouping some of the uplift on land values from landowners via a Community Infrastructure Level approach
- Private sector contributions (via a form of Business Improvement District type model) as businesses will benefit from having such a major route on their doorstep
- Scope to align the work programme with the investment to make better use of resource and to drive more effective skills development

This needs to be underwritten nationally to create certainty which in itself will facilitate the investment via the mechanism mentioned above

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

Please refer to background paper below under 4)

Useful links to background papers:

- 1) More information regarding Ambition Broxbourne can be accessed at www.ambitionbroxbourne.co.uk
- 2) Broxbourne Local Plan - Please visit <http://www.broxbourne.gov.uk/resident-planning-and-building-planning-policy/development-plan> for more information
- 3) Last year the LSCC published

[*The Strategic Case for Investment in the West Anglia rail route*](#), which sets out:

- a) The huge economic importance of the London-Stansted-Cambridge Corridor;
- b) The large levels of economic and population growth already happening in the corridor;
- c) The role that investment in the West Anglia Line will have in enhancing the labour mobility and economic effectiveness

- 4) Lessons from major rail infrastructure projects

www.nao.org.uk/wp-content/uploads/2014/10/Lessons-from-major-rail-infrastructure-programmes.pdf



BSA - The Business Services Association

Response to the National Infrastructure Commission Consultation

January 2016

Large-scale transport infrastructure improvements in London

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades.

According to Centre for Cities, between 2004-2013, London's population grew faster than any other of the UK's top ten metropolitan areas¹. The Greater London built-up area is nearly five times larger than the next largest of Greater Manchester. This means London has unique infrastructure pressures.

High house prices, coupled with population growth, will likely see more people move to the outskirts of London in search of cheaper dwellings. This development will necessitate improvements to suburban train lines such as Thameslink, Southern and Chiltern Railways in order to cope with increased demand along with a more positive and ambitious residential and mixed use development at and around local stations (both existing and planned). A limited amount of track space already hinders these often overcrowded services, a difficulty that will be exacerbated by a lack of investment and redevelopment.

This picture of steady, rapid growth means London's already strained transport network will face increasing pressure. Crossrail will add 10% capacity to the capital's rail network, however former TFL Commissioner, Sir Peter Hendy, has previously said that it will be 'immediately full' upon opening. This therefore suggests that a second major rail line is needed across London and the BSA welcomes proposals to explore the construction of Crossrail 2.

As with the first Crossrail, refurbished and increased station infrastructure will be a critical component of the project. Stations should be viewed as centres of their community, providing a basis for growth and development. New and improved stations with stable levels of investment can act as a catalyst for both housing and business development. In London especially, proximity to a train station is often a key consideration for someone looking to buy a home. Similarly easy access to transport links often affects a business' location decision. It is imperative that decision-makers take a whole community view of an individual project when judging its merits.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

Crossrail 2, similar to the original Crossrail, offers London an opportunity to add significant capacity to its transport network. As previously mentioned, if Crossrail is full upon opening in 2018, the need for additional capacity will be immediate. The BSA would therefore encourage the development of the Crossrail 2 project as rapidly as is appropriate and necessary. Crossrail 2 will mean the East-West and North-South corridors of London will be served by a high-tech, far reaching and modern rail

¹ <http://www.centreforcities.org/wp-content/uploads/2015/01/15-01-09-Cities-Outlook-2015.pdf>



service. It also creates an opportunity to plan significant new housing above and around many of the proposed new stations which needs to be seen as an integral part of the Crossrail 2 project and not just an afterthought.

Additionally, the Commission should examine closely options for renovating and rebuilding parts of Euston station. As a key hub station, providing access to the North West and Midlands it is already overburdened and in need of investment. Factor in Euston's role as HS2's London hub and proximity to a proposed stop on the Crossrail 2 route and the need to substantially upgrade the station is clear.

Crossrail should not be the only means by which London seeks to expand its intra-city rail service. The capital has already seen new rolling stock introduced on the tube network, such as on the Metropolitan Line, Hammersmith and City Line and Victoria Line in recent years. A number of planned extensions will increase the reach of the tube network, helping create jobs. According to TFL, the Northern Line's Battersea extension will create 24,000 jobs and 18,000 new homes by 2020². The National Infrastructure Commission should explore the possibility of further tube extensions as London continues to grow both in terms of people and square miles. The business case for individual projects and investment, particularly the strategic and economic case, are key to working through prioritisation and economic impact. It is crucial that the business case is cross-agency, able to compare a range of transport and other infrastructure investment.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Starting construction on Crossrail 2 sooner will increase the benefits of job creation and adding capacity. The original Crossrail provides a bountiful source of construction workers, designers and engineers with much needed experience of building a brand new, cross-city, subterranean railway line. Lengthy delays in beginning construction risks this pool of workers dissipating and being committed to alternative projects. Government must offer assurance and clarity as to whether and when Crossrail 2 will be built. As soon as this is offered, businesses can begin the necessary training and upskilling of workers needed to deliver the project.

The BSA urges the government to recognise the benefits of allowing for a seamless transition between major infrastructure projects. Crossrail and Crossrail 2 are an obvious example, being in the same geographical location, requiring the same equipment and demanding the same skills. The National Infrastructure Plan for Skills estimates a shortfall of nearly 400,000 construction and engineering jobs by 2020³. A lack of seamless transition between projects will exacerbate the problem.

The option of phased implementation should be looked at, which could mean that some of the Crossrail 2 infrastructure is not only built, but in operation ahead of 2028. This could allow for increasing London's transport capacity gradually and earlier than if the line was opened all at once. Particular attention should also be paid to development at key nodal points, where a number of major train lines will meet. This in turn should create 'spin-off' regeneration opportunities for housing and businesses to develop in these nodal points where they otherwise wouldn't have.

² <https://tfl.gov.uk/travel-information/improvements-and-projects/northern-line-extension>

³ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/464354/NIP_for_skills_final_web.pdf



4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

Tax Increment Financing (TIF) offers a particularly beneficial structure for funding large-scale transport infrastructure improvements in the capital. This is due to the relatively high-concentration of businesses, particularly around Central London. TIF works by dedicating a proportion of future tax revenues (normally business rates in the case of the UK) for infrastructure and development. The improved connectivity derived from such projects would usually see an increase in business rate revenue, providing a viable option for funding large-scale transport infrastructure. However, given that councils will soon be allowed to keep a portion of their business rate revenues, it will require coordination across all of London's boroughs.

In addition, opportunities for significant residential development at and around new stations and transport interchanges creates an opportunity to secure a mix of capital receipts and new revenue streams to support new transport investment.

As raised in the 2015 Autumn Statement and Spending Review, the pooling of local government pensions funds offers a potentially significant source of funding for infrastructure investment. Pooling the pension funds of London's local authorities, as well as possibly including other bodies such as Transport for London, will allow a greater single pot of investment. Pension funds have the advantage of being able to invest in projects which look longer-term. Infrastructure investment is ideal for pension funds as it offers very low risk due to being underwritten by the government and delivering steady, long-term returns.

In order to support the effective delivery of large-scale transport infrastructure, it is important that an ambitious but realistic time-frame for completion is put in place. A recent National Audit Office report said a project with lengthy timescales negatively affect the continuity, whilst short timescales can make delivery a virtual impossibility⁴.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied?

BSA members have experience of constructing major infrastructure projects across the globe, including, but not limited to, Canada, U.S.A. and Dubai. As with the UK, stability is key to the success of any infrastructure programme, with constructors reliant on the assurance that long-term projects will remain funded and immune from sudden changes or cancellations.

Singapore and Hong-Kong, as major, densely packed metropolises with high demand for transport infrastructure have taken the approach of 'upwards not outwards'. Given the limits on space that exist in both cities, particularly Hong-Kong, projects are being proposed and implemented that will see transport systems make use of space above the city rather than spreading outwards.

⁴ <https://www.nao.org.uk/report/delivering-major-projects-in-government-a-briefing-for-the-committee-of-public-accounts/>

LONDON'S TRANSPORT INFRASTRUCTURE



RESPONSE TO NIC CALL FOR EVIDENCE

JANUARY 2016

BuroHappold Engineering Response to NIC call for evidence

Large-scale transport infrastructure improvements in London

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

Accommodating London's growth in order to maintain its competitive position as a leading global city is probably the greatest challenge faced today by London – both from an economic as well as a social perspective. It will require the provision of a far greater quantity of housing that is affordable to 'normal' employees whilst, at the same time, being readily accessible to jobs. Studies have highlighted that around 50,000 new homes per annum will have to be built to meet London's needs, year on year for the next 20 years. Although there are substantial **public sector assets** in London, and a programme of rationalisation is underway to release surplus assets for other uses and in particular housing, public sector budget constraints mean that central and local government departments and other public sector bodies are being directed to gain the full market value from any sales. This immediately constrains the opportunity to provide homes that are affordable.

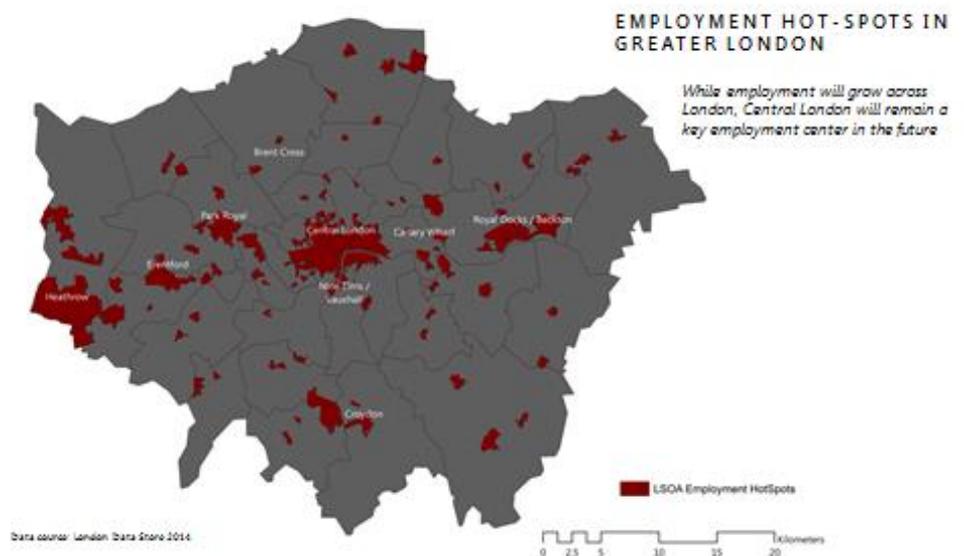
Many organisations based in the capital are struggling to attract and retain quality staff, driving wage inflation and reducing the competitiveness of London for employers. One of the key **Quality of Life** indices against which cities are measured is the ability to reach the workplace within 30 minutes of leaving home. London has numerous acknowledged attractions, including a thriving and dynamic employment 'engine' and many accept a daily commute of an hour or more. However, increasing accommodation costs and overcrowding and congestion on the transport network threaten to tip the balance in favour of other cities as more attractive places to live and work.

The historical 'terminus' model of London's Victorian railway network adds to the challenges of the capital, with rail services decanting huge numbers of rush hour passengers onto London's transport network, and London Underground in particular. The lack of cross-London lines removes the option of direct inter-regional or international rail services, forcing passengers to change modes at packed terminus stations, significantly lengthening travel times and negatively impacting the quality of life for many.

Crossrail will make a significant difference to East-West mobility across London from Essex to the Thames Valley when it opens in 2018. It will improve accessibility to a number of key employment 'hotspots'. However it is predicted that by 2030 it will be close to capacity, and additional rail capacity of this nature will be needed.

Employment Hotspots

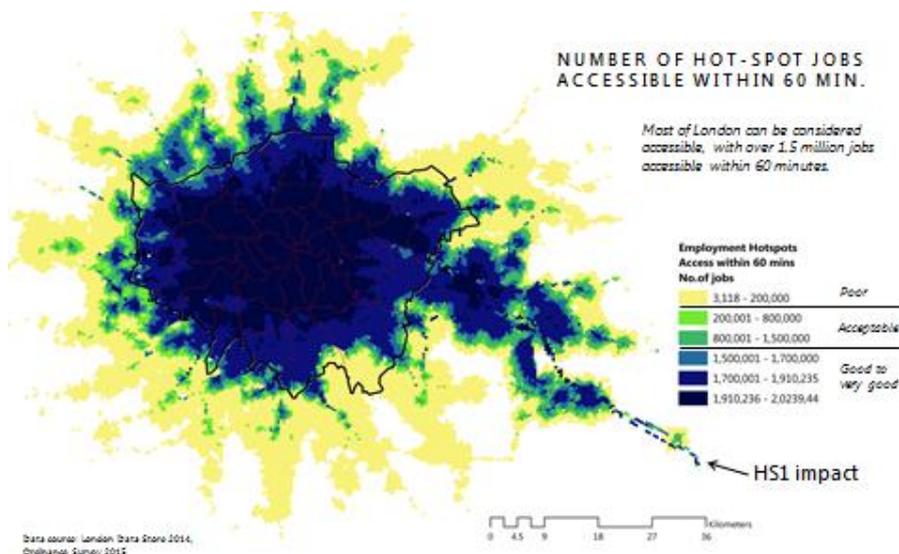
Unlike other cities, employment in London is concentrated in a relatively small number of areas. At BuroHappold, we have modelled these 'Hotspots' and planned developments (for example the area around Old Oak Common where around 65,000 jobs is forecast to be created by proposed development around a new Crossrail and HS2 station).



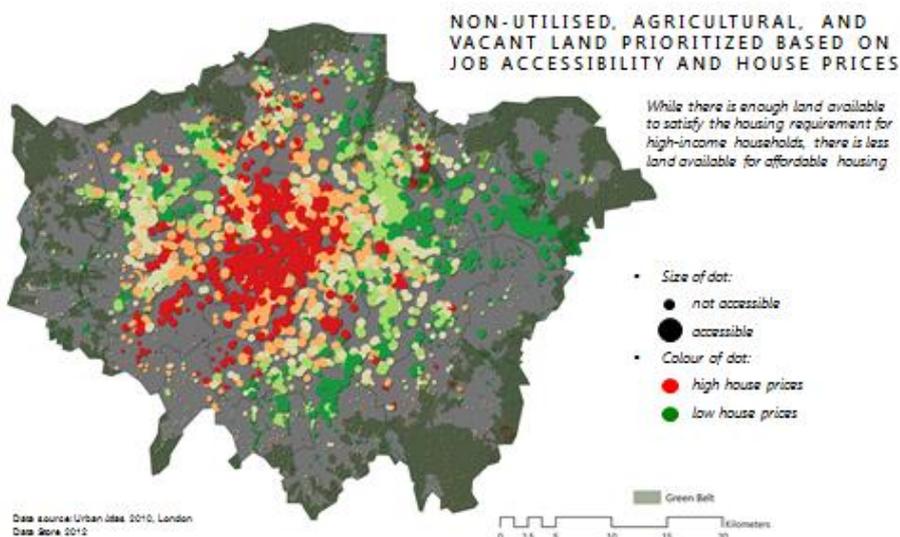
Accessibility to Employment

Current transport accessibility to London employment areas could be considered good for much of the capital, with most areas reachable by current and planned transport infrastructure within 60 minutes.

It should be noted on the diagram adjacent how HS1 and the Javelin services from Kent have had a strong impact on extending job accessibility.



Land Availability



London has a good supply of non-utilised, vacant and agricultural land that could be made available for housing. Much of it is blessed with reasonable (existing or planned) transport connectivity to employment.

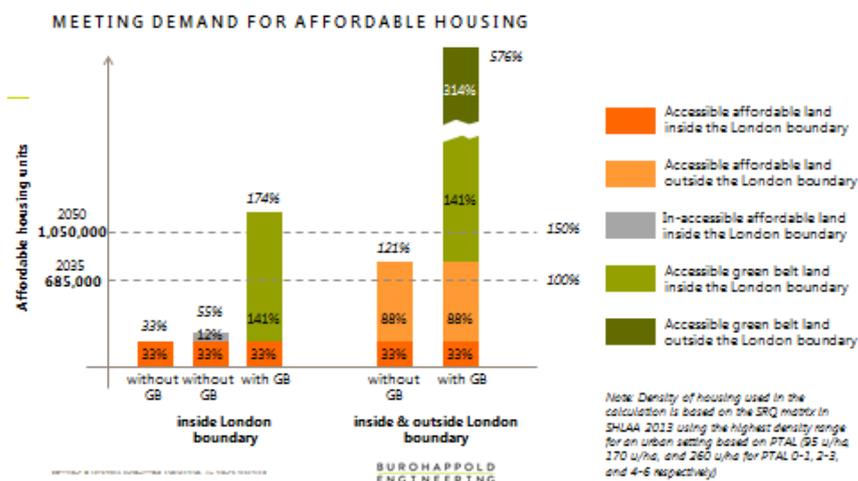
However, high land prices, particularly of sites close to the centre of the city, excludes many of these areas from being suitable for the development of housing that is affordable for those on anything other than

very high salaries or with significant funds to invest.

Meeting the Demand for Affordable Housing

Our modelling has identified the areas that are available for development, accessible to jobs via current and planned transport infrastructure (including Crossrail), and (crucially) affordable.

However, even if fully developed, this land will only meet 33% of the forecast needs for 2035. [NB Our calculations are based on the SRQ matrix in SHLAA 2013, using the highest density range for an urban setting].



Consequently, other options need to be considered if London's competitiveness and position as an economic powerhouse is not going to be compromised.

Examining other parcels of land within the London boundary, a further 12% of needs could be met - if they could be made more accessible to employment by improvements to the transport network.

We have also identified accessible affordable land outside London's boundary that, if made available for homes, could meet the housing needs of the City for the next 20 years. Looking further ahead to 2050, one could consider the transfer of a small amount of accessible greenbelt land for housing needs and this would enable London to accommodate, in an affordable fashion, all of its forecast population demands.

Although releasing greenbelt land is considered a tough political step to take, we believe it could be mitigated by creating equal or greater areas of amenity land within the London boundary (and elsewhere). This could be achieved either by remediating challenging brown-field sites or utilising sites which are likely to remain inaccessible through lack of good transport connectivity.

In summary, we see two key areas to focus on in order for London to continue as a world-leading city, namely:

1. Improvements to transport infrastructure particular linking affordable, available land with employment areas
2. Some future use of green belt land already accessible to major transport routes from central London, mitigated by land swaps to maintain areas of amenity.

We see Crossrail 2 and Cross City Connect – see later – falling into the first category.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London – on road, rail and underground – including, but not limited to Crossrail 2?

BuroHappold Engineering has invested significant time and resources to the examination of infrastructure improvements for London in two key areas:

1. An alternative to the London end of HS2 that will deliver much greater benefit, in terms of inter-regional connectivity, economic regeneration, vital additional capacity and network resilience, whilst requiring **no additional investment cost** than that forecast for the full delivery of the current terminus at Euston.
2. The use of low level bridges to unlock key development sites in East London – with particular emphasis on the priority development area known as 'City in the East'

A. Cross City Connect

The current proposals for linking the planned HS2 rail route into London represent a missed opportunity. This could be the foundation of an effective and integrated modern railway network for the UK. What's more, the proposed terminus station development at Euston not only delivers poor economic returns, but will become ever-more costly and difficult to deliver.

Working with tunnelling experts OTB, BuroHappold Engineering is promoting an alternative route which links with HS2 in the west of London, crosses the city in tunnel and links with HS1 in the east of London. Our Cross City Connect proposal has a single major rail interchange at Waterloo/ Southwark/ Blackfriars with substantially better onward connections into London as well as providing seamless access to Europe.

We have sought to address all of the major issues facing the current proposals for the HS2 terminus at Euston, and fulfil the original intent of HS2 project.

It is important that HS2 hits its ambitious timetable. With the right level of support and decisive commitment, it will be possible to deliver Cross City Connect by 2026 – the current timetable for the partial terminal at Euston promoted by HS2 Ltd. It is certainly possible to deliver the full scheme in advance of HS2 Phase 2 in 2033. From a timing standpoint, this will also enable additional demand to be met at a point when the current Crossrail route nears capacity.

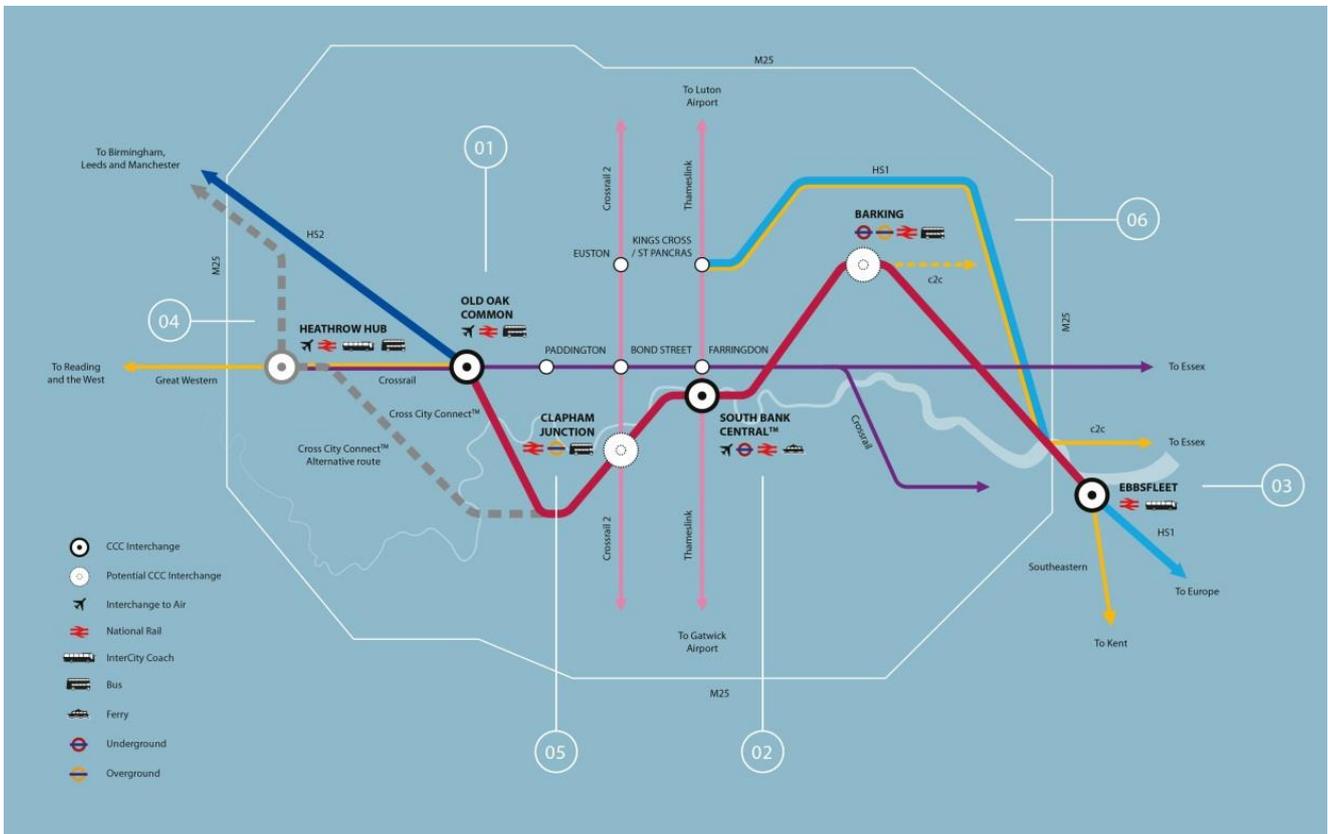
Euston HS2 major issues:

- **Delivery challenges:** Euston requires a massive land-take on a constrained and complex operational site. Adding eleven new HS2 platforms to the challenges of upgrading the underground station, delivering Crossrail 2, and regenerating the local area is a step too far.
- **Spiralling costs:** Land acquisition and construction estimates for the completion of the Euston terminal, from various sources, has risen from the original budget of £1bn to between £4bn and £7bn. Even the current partial build-out proposals tabled are acknowledged to cost well over £2bn –without including the costs of land acquisition nor the work required by others to complete the build-out.
- **London disruption:** Over two decades of misery for those living and working around the area and for commuters using the regional line into the existing station.
- **Connectivity:** Key link to HS1 has been dropped – removing the direct international link and also inter-regional connectivity.
- **Wasted regeneration boost:** To counter rising costs, significant over-site development is planned. Yet Euston is already benefitting from the regeneration around Kings Cross and may gain the benefit of a future Crossrail 2 station. The incremental value delivered by HS2 will be marginal.

The Cross City Connect Solution

We have taken a fresh look at some of the original aims of the HS2 project and drawn on our international experience and upon best-practice in urban infrastructure. Our solution, Cross City Connect (CCC), traverses London in tunnel construction from a link with HS2 in the West to Ebbsfleet Station in the East. It links directly to Europe via HS1, and connects regional services from Essex and Kent to the Thames Valley, the West, Midlands and the North. There will be a new central London hub on the South Bank beneath and between Waterloo and Southwark. It has the capacity to include additional interchanges to enhance regional connectivity and unlock much-needed growth areas.

Working closely with tunnelling specialists OTB, we have defined a route that is **deliverable for no more than the cost of the full delivery of Euston, within current HS2 programme timeframes.**



01 Western Hub - OLD OAK COMMON Option

Our proposal sees Old Oak Common become the western station for the CCC underground rail route.

- Key London HS2 station with connections to Crossrail and Great Western Mainline.
- Further boost to the area's massive regeneration potential
- The opportunity to create an interim terminus for HS2 Phase 1, allowing time for the delivery of a better solution ahead of Phase 2.
- Options to provide additional connectivity to the Bakerloo Line and to overground services at Willesden Junction. (See later section for more information)

02 Central London Interchange - SOUTH BANK CENTRAL™

A new central station that sits beneath and between four existing stations in the heart of London. Initial investigations demonstrate that this is a viable and economically beneficial option.

- Significant benefits in terms of connectivity, network capacity and resilience.
- Provides walking access to Central London.
- Links to 5 underground lines, Thameslink and overground services to the southeast and southwest.
- More efficient dispersal at Waterloo, Southwark / Blackfriars.
- Regeneration boost to the South Bank, and to the Elephant & Castle and Vauxhall Nine Elms opportunity areas.

03 Eastern Hub - EBBSFLEET

Coming to the surface near Rainham, where there is space to service and turn around trains, our route travels to the existing HS1 station at Ebbsfleet as a gateway to both international and inter-regional services.

- Connection to existing HS1 services to Europe.
- Inter-regional trains linking the Thames Valley and the West to Kent (Javelin) and Essex (c2c).
- Boost to the embryonic Ebbsfleet Garden City.
- Ease of access to M25 and other regional motorways.

04-06 Potential CCC Interchanges

Cross City Connect has been designed to enable significant future connectivity and regeneration to be delivered cost-effectively:

- **West London linkage option at HEATHROW HUB:** Depending on the final decision on the location of the future southeast airport, there is also an option to link directly to a new transport hub and employment site at Heathrow. Heathrow Hub could provide a direct rail link to this major international gateway for the south-west, midlands, north and south-east via HS2, GWML, Crossrail and Cross City Connect, as well as easy access from the motorway network. This also has the advantage of space that is more easily developable than Old Oak Common, whose ambitious development plans are complicated by the large amount of live rail infrastructure, including the construction of a new Crossrail Depot.
- **CLAPHAM JUNCTION:** There is the option for an interchange with Crossrail 2 and the many overground services to South London and beyond.
- **BARKING:** There is the potential for a future station to provide impetus to The City in the East area to support London's projected growth.

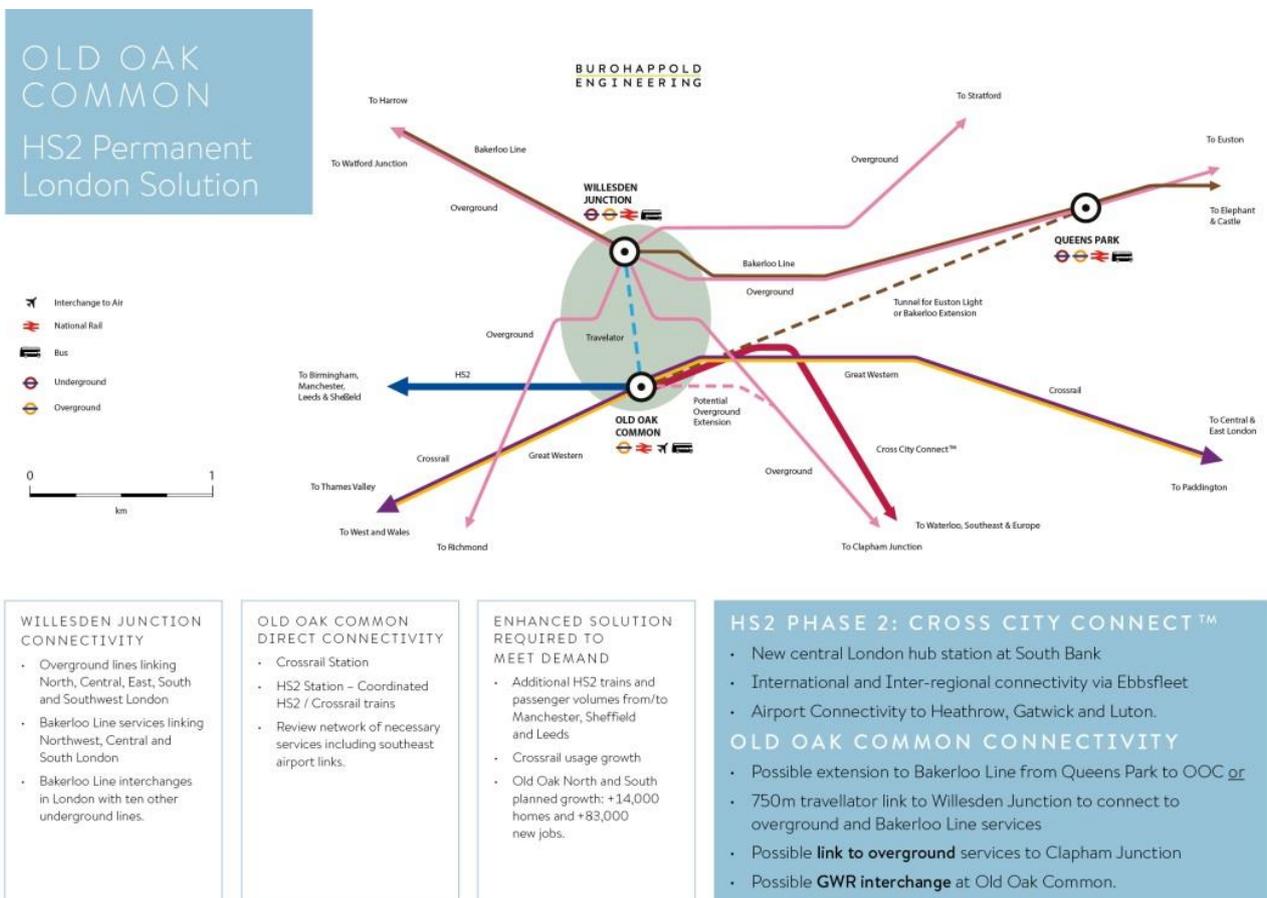
MEETING HS2 PROGRAMME TARGETS

It is important that HS2 hits its ambitious programme milestones. We are advocating a two-phase solution, that aligns exactly with the HS2 programme with an interim terminus at Old Oak Common for HS2 Phase1, with the full Cross City Connect route open in time ahead of the opening of HS2 Phase 2 in 2033.

A Temporary Terminus at Old Oak Common

Old Oak Common presents a viable *interim* solution for the first phase of HS2:

- HS2 passengers transfer to a waiting Crossrail train for onward transfer to central and eastern London. Passengers can also travel west on Crossrail to Heathrow and the Thames Valley
- Turnaround of HS2 trains using the six HS2 platforms, supplemented by the first section of the CCC tunnel
- Options for increased connectivity via a traveller link to Willesden Junction, or an extension to the Bakerloo Line at Queens Park



Why Old Oak Common won't work as a permanent HS2 Terminus

By the opening of HS2 Phase 2, a new solution will be required to cope with significant additional volumes:

- HS2 passengers travelling to and from Manchester, Sheffield and Leeds.
- Crossrail will experience increased usage from residential and job growth along its route.
- The development of Old Oak Common North and South is predicted to add up to 14,000 homes and bring 80,000 jobs to the area.
- London's population is forecast to increase by close to 2 million additional residents by 2030.

By 2030, Cross City Connect will be ready to carry passengers to its central London interchange and on to Ebbsfleet with connection to HS1 and regional services to Essex and Kent.

Potential impact of Cross City Connect on employment, productivity and housing supply in London and the southeast?

Connectivity, capacity and resilience:

- Greater UK **regional connectivity**, from the northwest, northeast and Midlands to London, and to the southeast and southwest, slashing travel times and giving direct access to new markets.
- **Reduced traffic** volumes on the M25 and the wider southeast motorway network, increasing the efficiency of many business trips and commercial logistics.
- Broader and more **efficient dispersal** at Waterloo / Southwark / Blackfriars with more **effective access** to other services.
- **Reduced pressure on Crossrail** long term via our additional east-west route.
- Direct rail links between our regional cities and key **international transport gateways** via CCC interchanges, providing more efficient access to overseas markets.

Development and regeneration:

- Access to a larger labour pool supports the **enlargement of the London Economic Area**.
- **Supports trends** for flexible working, access to affordable housing and quality of life drivers.
- South Bank Central will **unlock the potential economic value** of the area around **Waterloo and Blackfriars** - A possible southern extension to The City's business and financial services district.
- A significant boost to the key regeneration sites at **Elephant & Castle, Vauxhall and Nine Elms**.
- Possible future station in Barking to drive **regeneration in the Thames Gateway**, providing vital access to employment opportunities and unlocking wider housing plans to the east of London.
- Euston Station and surrounding area can **be redeveloped with nearby Kings Cross** in a structured way without HS2 complexity.

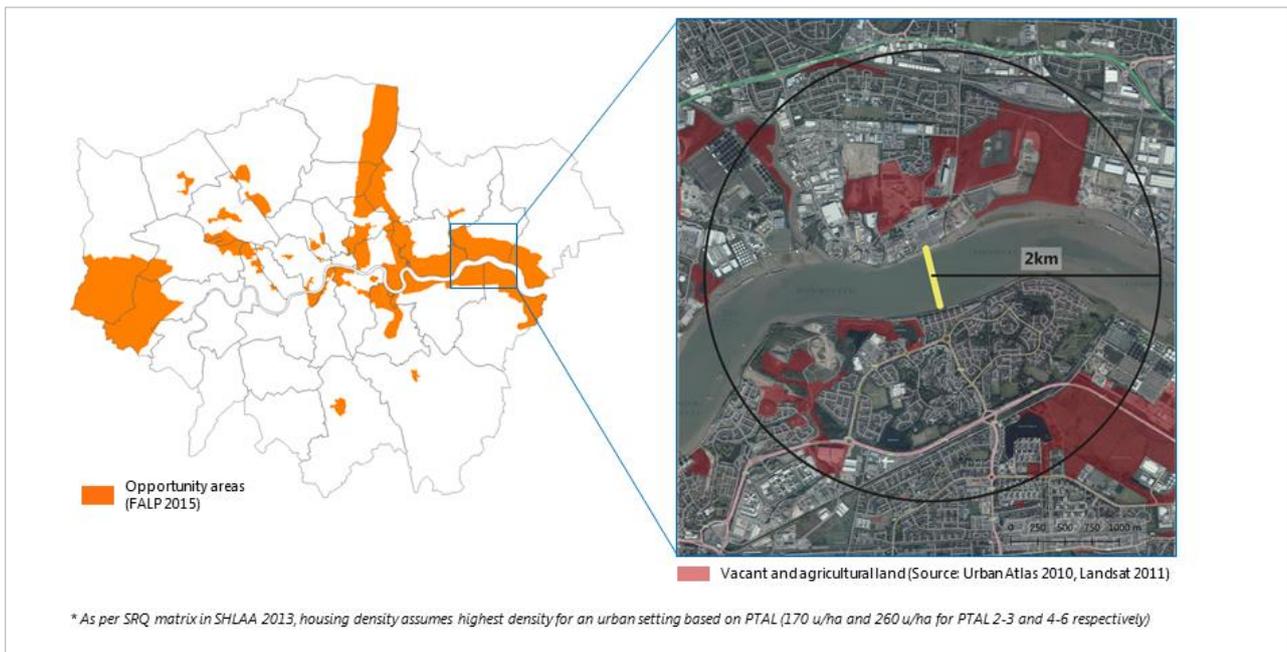
Cost Certainty and Minimal Disruption

- Tunnelling beneath London, following existing rail corridors **manages risk** more efficiently.
- **Through-running** at South Bank Central avoids the need for eleven platforms at Euston's terminus.
- Subterranean stations **minimise land-take** and provide greater opportunity for valuable Over-Site Development. And create significantly lower disruption to working London during construction.
- **Delayed expenditure** of significant public funds to the second phase of the HS2 programme.

B. Low Level Bridges in East London

Working with urban designers Farrells, we have identified how low level bridges will help unlock land for housing development and improve job accessibility for existing and future communities in East London.

As an example, our analysis has shown that within a 2km radius of a potential bridge connecting Thamesmead with Barking Riverside almost 50,000 new homes could be built. A bus connection over the bridge would link Abbey Wood Crossrail Station in the south with the future Barking Riverside overground station in the north and increase job accessibility. It will increase transport network resilience and also enhance access to London's waterfront for the benefit of local residents.



Initial findings have been shared with TfL and the Port of London Authority. More information on our recommendations can be found in a separate BuroHappold / Farrells NIC submission.

How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?

There is an absolute need for the current Green Book methodology for the evaluation of transport infrastructure to be thoroughly revised to take into account the full range of benefits – and also to recognise value-destroyers that major transport infrastructure can represent for an area.

As was highlighted by the HS2 Growth Taskforce, and referenced in the NIC Terms of Reference, a major transport infrastructure investment delivers far greater benefits than greater capacity, reliability and faster journey times; In addition to connecting organisations to new markets, connecting jobs and labour drives significant economic value, and the role of interchanges as anchors of local regeneration has been clearly demonstrated in the case of Kings Cross St Pancras. Full business cases need to be created for all major investments, that enable far greater transparency in prioritisation and decision-making.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

The currently proposed Crossrail 2 tunnel alignment focuses on locations where there is already substantial development (such as Chelsea and Victoria) and where regeneration is already in progress (such as the Euston Cross area). An alignment that runs further east in the city centre, both south and north of the river, would deliver far greater above station and area wide regeneration benefits. Furthermore, greater consideration should be given to locating underground stations for the tunnel section on alignments which give access to several existing stations. Assuming a route further South, an example might be a station between and linking Elephant and Castle Tube and Surface Rail stations.

To the east and north of the Thames one could consider something which links and integrates Tower Hill Tube, Tower Gateway DLR, and Fenchurch St stations. In this way, the new station can both enhance integration between existing services by creating mega hub stations, and spread over-station redevelopment opportunities over a much larger area. The benefits of such strategies would be considerable. Furthermore, whilst the costs of additional access and egress points might be slightly higher, these would be more than off-set by the reduced costs and disturbance at the existing interchange stations due to a more even distribution of interchange passenger loads, reducing the scale of works to increase local capacity.

4. What are the options for the funding, financing and delivery of large-scale infrastructure improvements in London, including Crossrail 2?

In terms of "Financing", recent major tunnelling projects in London, including Crossrail and the Thames Tideway Tunnel, along with developments in infrastructure financing in Canada, have in our view shown the way forward. Crossrail shows that construction risk, when going underground, is not as great as thought. Indeed, it can now be argued that staying at the surface is far more risky than going underground. Expected return from investors directly correlates to risk. We have seen with Thames Tideway that cost of capital on large tunnelling projects need not be excessively high. What is more, we have a growing pool of funds held by pensions. In Canada this has been mobilised to deliver much needed infrastructure via the major pension investment funds. Pension funds are the perfect vehicle for infrastructure funding of this type, not only creating stable long term returns for those depending on the pensions, but ensuring that contributions made today are being mobilised for the benefit of those making those contributions. A rare win:win.

With such a privately financed structure, one can move to "Delivery" via a public private project company model. If correctly structured in terms of risk allocation, this can deliver significant benefits in terms of ongoing innovation and whole life costing disciplines, while ensuring appropriate controls are retained within the public sector, thus ensuring a company that focuses on its specific business, yet operates within a structure that considers wider social and economic issues.

- What is an appropriate local and regional contribution – given the potential distribution of benefits to business, residents, transport users and the wider economy – and how could this be achieved?

It is clear that investment in transport infrastructure has wide and decisive regional catalytic impacts, enabling residents of both London and the peripheral commuting counties in the South East and Eastern Regions to access employment opportunities in the Greater London area. For example, it is clear that Crossrail 1 will deliver significant economic benefit to the commuting residents of Berkshire, Essex. What's more, if the proposed diversion of western Crossrail services to the WCML goes ahead, Bedfordshire, Hertfordshire and Buckinghamshire residents will also benefit, largely at the expense of London business ratepayers. One could also argue that as workers continue to move further out of London to find homes they can afford, such upfront match investment in transport infrastructure is essential if large employers in central London are to access one of the world's most cosmopolitan, diverse and skilled workforces – due to the many reasons cited in the call for evidence.

Therefore, we recommend that the South East and Eastern Regions are given utmost consideration when contemplating further infrastructure investment in London. As co-beneficiaries, and potential co-funders, of such infrastructure it is

important that their role is recognised in helping London deliver its strategic goals of affordable family housing and a competitive labour supply.

While we understand that there are fora for such engagement in decision making already in place, we think that their role and powers will need to be reviewed given the challenges faced. For example, many of the newly announced City Regions designated as part of the 'Northern Hub' policy constitute an urban city plus the peripheral and commuter hinterland in which significant parts of the labour market reside. These City regions will be given significant powers over infrastructure investment and service level agreements that London does not have over activities in the South East and Eastern Region. This presents a potential comparative disadvantage for London in the planning and funding of such infrastructure.

What is clear is that existing funding models will be insufficient for continued investment of the scale London has witnessed in the last few years. While the Crossrail 1 funding model has been lauded as particularly successful in enabling government to recoup some of the costs from beneficiaries in central London (employers and developers), the next stage will require this pool of beneficiaries to be enlarged further, given the scale of investment required. So, who are these potential additional beneficiaries? The Crossrail 1 experience has shown that they include a far more varied and geographically wider group than initially assumed: residents and employers in outlying commuter counties; speculative buy to let landlords near proposed stations; developers both in London and in outlying commuter areas; and property in London near stations who have seen phenomenally capital gains since the project's route was first announced.

There is an ever-increasing suite of mechanisms available to local authorities to capture value generation from new development – s106, CIL, TIF, and Incremental Business Rates. However, these do not work well when dealing with intra-regional infrastructure developments, such as the proposed Crossrail 2 and other infrastructure benefiting the capital's economic hinterland, or in capturing any capital gains. We recommend that further research is commissioned to investigate the innovative options available to London to both capture some of this capital wealth generation (potentially building on the recently published work of the Centre for Cities "*Beyond Business Rates: Incentivising cities to grow*") and also ensuring enhanced contribution from beneficiary counties on London's periphery.

The new profusion of Local Enterprises Partnerships is, for example, one way that London could seek to ensure that the funding of infrastructure is fair to all beneficiaries – as shown recently by the Hertfordshire LEP's funding contribution to the Metropolitan Underground works at Watford. We should recognise, however, that such arrangements will lead to local calls from the counties for greater scrutiny over such spending decisions, with a widely held assumption that transport services are often skewed in favour of the capital's requirements over these commuting counties. Such discussion over service level agreements and operations is best at the regional level, potentially using the regional fora discussed earlier.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

- Construction of rail stations underground is now well-established – eg The recent underground Magenta station in Paris between Paris Nord and Paris Est stations.
- Terminus stations in cities have been rejected in favour of through stations in a number of major European cities including Berlin, Vienna, Stuttgart and Marseilles.....and historically in Brussels, the old north and south stations were connected to make a through line.
- The 7 Line Subway Extension in New York is being funded with NYC funds from bond sales to be repaid with property tax revenues from development in the area around the new station (the Hudson Yards). Other transport projects in the US are similarly financed (e.g. Atlanta's Belt Line)..
- Hong Kong's MTR are developing real estate and transport themselves.
- BRT as a potential 'cheaper' option to connect areas of London that are poorly served by public transport. New York serves as a good example of how they are trying to upgrade their bus network to areas that are less served.

LONDON'S TRANSPORT INFRASTRUCTURE:
RESPONSE TO NIC CALL FOR EVIDENCE

CO N T A C T

Andrew Comer, Partner

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BSA - The Business Services Association

Response to the National Infrastructure Commission Consultation

January 2016

Large-scale transport infrastructure improvements in London

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades.

According to Centre for Cities, between 2004-2013, London's population grew faster than any other of the UK's top ten metropolitan areas¹. The Greater London built-up area is nearly five times larger than the next largest of Greater Manchester. This means London has unique infrastructure pressures.

High house prices, coupled with population growth, will likely see more people move to the outskirts of London in search of cheaper dwellings. This development will necessitate improvements to suburban train lines such as Thameslink, Southern and Chiltern Railways in order to cope with increased demand along with a more positive and ambitious residential and mixed use development at and around local stations (both existing and planned). A limited amount of track space already hinders these often overcrowded services, a difficulty that will be exacerbated by a lack of investment and redevelopment.

This picture of steady, rapid growth means London's already strained transport network will face increasing pressure. Crossrail will add 10% capacity to the capital's rail network, however former TFL Commissioner, Sir Peter Hendy, has previously said that it will be 'immediately full' upon opening. This therefore suggests that a second major rail line is needed across London and the BSA welcomes proposals to explore the construction of Crossrail 2.

As with the first Crossrail, refurbished and increased station infrastructure will be a critical component of the project. Stations should be viewed as centres of their community, providing a basis for growth and development. New and improved stations with stable levels of investment can act as a catalyst for both housing and business development. In London especially, proximity to a train station is often a key consideration for someone looking to buy a home. Similarly easy access to transport links often affects a business' location decision. It is imperative that decision-makers take a whole community view of an individual project when judging its merits.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

Crossrail 2, similar to the original Crossrail, offers London an opportunity to add significant capacity to its transport network. As previously mentioned, if Crossrail is full upon opening in 2018, the need for additional capacity will be immediate. The BSA would therefore encourage the development of the Crossrail 2 project as rapidly as is appropriate and necessary. Crossrail 2 will mean the East-West and North-South corridors of London will be served by a high-tech, far reaching and modern rail

¹ <http://www.centreforcities.org/wp-content/uploads/2015/01/15-01-09-Cities-Outlook-2015.pdf>



service. It also creates an opportunity to plan significant new housing above and around many of the proposed new stations which needs to be seen as an integral part of the Crossrail 2 project and not just an afterthought.

Additionally, the Commission should examine closely options for renovating and rebuilding parts of Euston station. As a key hub station, providing access to the North West and Midlands it is already overburdened and in need of investment. Factor in Euston's role as HS2's London hub and proximity to a proposed stop on the Crossrail 2 route and the need to substantially upgrade the station is clear.

Crossrail should not be the only means by which London seeks to expand its intra-city rail service. The capital has already seen new rolling stock introduced on the tube network, such as on the Metropolitan Line, Hammersmith and City Line and Victoria Line in recent years. A number of planned extensions will increase the reach of the tube network, helping create jobs. According to TFL, the Northern Line's Battersea extension will create 24,000 jobs and 18,000 new homes by 2020². The National Infrastructure Commission should explore the possibility of further tube extensions as London continues to grow both in terms of people and square miles. The business case for individual projects and investment, particularly the strategic and economic case, are key to working through prioritisation and economic impact. It is crucial that the business case is cross-agency, able to compare a range of transport and other infrastructure investment.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Starting construction on Crossrail 2 sooner will increase the benefits of job creation and adding capacity. The original Crossrail provides a bountiful source of construction workers, designers and engineers with much needed experience of building a brand new, cross-city, subterranean railway line. Lengthy delays in beginning construction risks this pool of workers dissipating and being committed to alternative projects. Government must offer assurance and clarity as to whether and when Crossrail 2 will be built. As soon as this is offered, businesses can begin the necessary training and upskilling of workers needed to deliver the project.

The BSA urges the government to recognise the benefits of allowing for a seamless transition between major infrastructure projects. Crossrail and Crossrail 2 are an obvious example, being in the same geographical location, requiring the same equipment and demanding the same skills. The National Infrastructure Plan for Skills estimates a shortfall of nearly 400,000 construction and engineering jobs by 2020³. A lack of seamless transition between projects will exacerbate the problem.

The option of phased implementation should be looked at, which could mean that some of the Crossrail 2 infrastructure is not only built, but in operation ahead of 2028. This could allow for increasing London's transport capacity gradually and earlier than if the line was opened all at once. Particular attention should also be paid to development at key nodal points, where a number of major train lines will meet. This in turn should create 'spin-off' regeneration opportunities for housing and businesses to develop in these nodal points where they otherwise wouldn't have.

² <https://tfl.gov.uk/travel-information/improvements-and-projects/northern-line-extension>

³ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/464354/NIP_for_skills_final_web.pdf



4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

Tax Increment Financing (TIF) offers a particularly beneficial structure for funding large-scale transport infrastructure improvements in the capital. This is due to the relatively high-concentration of businesses, particularly around Central London. TIF works by dedicating a proportion of future tax revenues (normally business rates in the case of the UK) for infrastructure and development. The improved connectivity derived from such projects would usually see an increase in business rate revenue, providing a viable option for funding large-scale transport infrastructure. However, given that councils will soon be allowed to keep a portion of their business rate revenues, it will require coordination across all of London's boroughs.

In addition, opportunities for significant residential development at and around new stations and transport interchanges creates an opportunity to secure a mix of capital receipts and new revenue streams to support new transport investment.

As raised in the 2015 Autumn Statement and Spending Review, the pooling of local government pensions funds offers a potentially significant source of funding for infrastructure investment. Pooling the pension funds of London's local authorities, as well as possibly including other bodies such as Transport for London, will allow a greater single pot of investment. Pension funds have the advantage of being able to invest in projects which look longer-term. Infrastructure investment is ideal for pension funds as it offers very low risk due to being underwritten by the government and delivering steady, long-term returns.

In order to support the effective delivery of large-scale transport infrastructure, it is important that an ambitious but realistic time-frame for completion is put in place. A recent National Audit Office report said a project with lengthy timescales negatively affect the continuity, whilst short timescales can make delivery a virtual impossibility⁴.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied?

BSA members have experience of constructing major infrastructure projects across the globe, including, but not limited to, Canada, U.S.A. and Dubai. As with the UK, stability is key to the success of any infrastructure programme, with constructors reliant on the assurance that long-term projects will remain funded and immune from sudden changes or cancellations.

Singapore and Hong-Kong, as major, densely packed metropolises with high demand for transport infrastructure have taken the approach of 'upwards not outwards'. Given the limits on space that exist in both cities, particularly Hong-Kong, projects are being proposed and implemented that will see transport systems make use of space above the city rather than spreading outwards.

⁴ <https://www.nao.org.uk/report/delivering-major-projects-in-government-a-briefing-for-the-committee-of-public-accounts/>

Large-scale transport infrastructure improvements in London

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

London is likely to continue to face issues associated with accommodating increasing population and in-commuting. Important among these will be the issue of air pollution.

Transport for London has reported that the number of trips made in London in 2013 averaged 26.1 million per day, an increase of 1.2 per cent over the previous year (including residents and non-residents).

Within this, there are a number of important trends. Over the 10-year period from 2003-2013, total trips increased by 11.4 per cent, with rail increasing by 52.3 per cent, Underground /DLR by 32 per cent and cycling by 53.9 per cent. By contrast, car driver trips decreased by 12.7 per cent over the same period. [<http://content.tfl.gov.uk/travel-in-london-report-7.pdf>]

Despite the fall in car numbers, legal compliance with air quality limits remains a very significant problem. The national Air Quality Strategy, published by DEFRA in 2015 [https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/486636/aq-plan-2015-overview-document.pdf] reports that the Greater London urban area currently has the highest NO₂ exceedance in the UK and that the capital's transport networks and construction activity means the task of reducing NO_x emissions, and NO₂ concentrations, is the most challenging in the country.

The London Mayor is taking forward a package of measures to bring London into compliance with NO₂ limit levels in the shortest possible time. This includes reducing emissions from buses and taxis, and introducing an Ultra Low Emissions Zone from 2020. Despite these initiatives, air quality is not expected to be compliant with legal standards before 2025.

In sum, new transport infrastructure and initiatives will be needed to move increasing numbers of people around greater London while actively reducing air pollution and its impact on human health. Increased demand for rail, Underground and cycling together with a marked fall in car driving all have the potential to help achieve this goal.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

- How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?

- What might their potential impact be on employment, productivity and housing supply in London and the southeast?

It is vital that investment priorities are clearly aligned with wider policy objectives and legal requirements. In keeping with our response to Q1, potential schemes should be prioritised with clear regard to legal responsibility concerned air quality and long term trends away from car use and toward public transport. In this regard, we are concerned by plans for further Thames crossing schemes based on road transport which stand to break positive trends away from car reliance and increase local air pollution concerns. More detail is given in our response to the river crossings consultation in 2014

[http://bettertransport.org.uk/sites/default/files/research-files/CfBT_TfL_River_Crossings_Consultation_Sep2014_FINAL.pdf].

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

-

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

- **What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?**

- **What innovative funding mechanisms could be considered to support delivery of key schemes?**

-

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

-

Open Consultation

National Infrastructure Commission call for evidence

London's transport infrastructure

The National Infrastructure Commission is a new, independent body which will look at long term infrastructure needs and provide impartial advice to ministers and Parliament. Before next year's budget they will publish a report on *large scale transport infrastructure improvements in London*.

You are strongly encouraged to provide details of the evidence and data to support your arguments to enable the Commission to understand more fully the basis on which conclusions have been reached.

Please note, the Commission will not be considering questions relating to airport capacity. The Airports Commission has already examined this issue in detail.

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

<p><u>Reduce journey numbers</u></p>

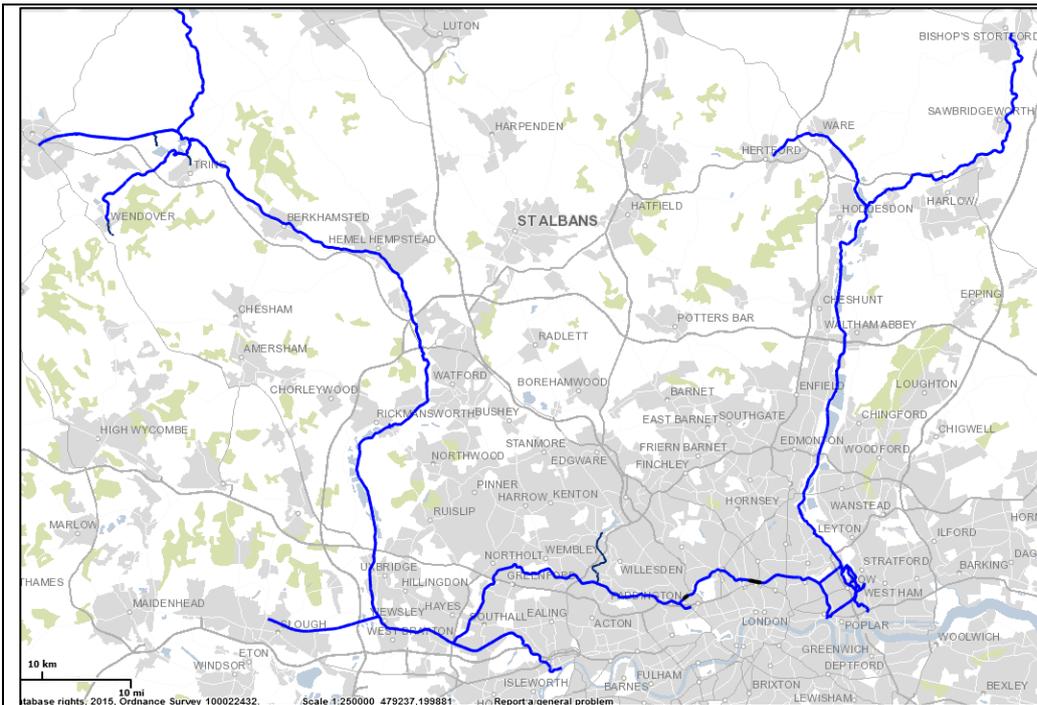
<p>What further measures can be taken to better integrate land uses (residential, employment, education, health etc) to reduce the need to travel, including use of technology and flexible working.</p>
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<p><u>Cycle-friendly public transport</u></p>

<p>Consider further how trains and buses can better accommodate carriage of bikes as a means of continuing journeys with a view to relieving peak pressures on rail and road.</p>

<p><u>Sustainable Travel</u></p>

<p>Canal and river towpaths offer attractive traffic-free routes for people to travel to work, school and for leisure. Canal & River Trust's has around 100 miles of waterways and towpaths in the Capital and surrounding areas, including around 65 miles within the fifteen London boroughs north of the Thames. These waterways connect the Lee Valley, Central London and the West (see map below)</p>



The Trust's Waterways in the London Area

Waterways support London's growth, connecting people to key employment, opportunity and visitor destinations such as:

- London Docklands
- Meridian Water Enfield
- Tottenham Hale
- Stratford and the Queen Elizabeth Olympic Park
- Kings Cross
- Paddington Basin / Little Venice
- Old Oak Common & Park Royal MDC
- Southall Gas Works
- Crossrail western extension – Hanwell, Southall, Hayes, West Drayton, Iver, Langley, Slough

Cleaner Air for London

Along with other measures, towpaths contribute to reducing vehicular congestion and air pollution within London. For example, the Environmental Audit Committee's Action on Air Quality Report mentions a broader role for LEPs and Regional Growth Funds to achieve cleaner air quality alongside their jobs and growth targets.

Value for Money

The past 15 years has seen significant growth in popularity and use of London towpaths, in particular on the Regents Canal which serves Central London and the City. Some London towpaths are expected to receive investment from the Mayor of London's Cycling Vision as Quietways. However, the Regents Canal (expected to remain the most heavily used) and the River Lee Navigation are excluded – both could be improved significantly for commuter and local journeys on foot and bike.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London – on road, rail and underground – including, but not limited to Crossrail 2?

Adequate cycle storage for peak time travel on public transport.

Consider interchange facilities at public transport hubs for connections to nearby canal towpath routes for walking and cycling, including provision of appropriate cycle parking, cycle maintenance services, lockers, toilets and showers to encourage onward bicycle journeys.

Information on links to walking & cycling routes for leisure passengers should be made more easily available on public transport – for example for journeys made one way by train and return by foot or bicycle along towpaths.

2a. How should they be prioritised, taking account of their response to London’s strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?

No comments

2b. What might their potential impact be on employment, productivity and housing supply in London and the southeast?

No comments

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Freight Transport by Water

The Trust believes that the environmental impact of the construction phase of Crossrail 2 can be reduced by taking advantage of the River Lee Navigation (a Commercial Waterway).

The Trust has engaged in preliminary conversations with the Crossrail 2 team regarding the opportunity of using the River Lee Navigation as a freight transport corridor to move materials (both construction materials and waste) from the tunnel portal in the Tottenham area out onto the River Thames, via a transfer facility that could be constructed in the Bow area of East London. We would very much like to continue this dialogue and would suggest that the NIC/Crossrail 2 team commission a feasibility study to look at this (and other) options in more detail. Our experience of projects of this nature in the past has led us to conclude that this feasibility study work needs to be undertaken several years ahead of the proposed start of construction.

Safe and sustainable routes to work

We believe that part of a sustainable transport policy during the construction phase of Crossrail 2 should include the provision of safe and sustainable routes to work – providing opportunities for the workforce to move away from cars and trains and over to walking and cycling to work. The towpaths running along waterways of London could be part of an integrated Crossrail 2 workforce

transport network and we would like to work with the NIC/Crossrail 2 to develop this concept further.

Utility Corridors

Beneath many of the Trust's London towpaths there are buried utilities such as fibre optic and high voltage electricity cables. These take advantage of direct and straightforward routes around and through the Capital. The Trust believes that further development of these utility corridors could be undertaken to allow improved communications and/or asset resilience.

Energy Production

The water flowing through the Trust's 3200 kilometres of waterways (of which around 100km which pass through and around London) contains enough thermal energy to produce approximately 640 MW of energy. This has attracted a number of businesses which now utilise this low carbon source to heat and cool their buildings. DECC to have acknowledged this potential in their Heat Map which includes a specific canal layer <http://tools.decc.gov.uk/nationalheatmap/>. The energy is extracted using water sourced heat pumps which are very efficient compared to conventional forms of heating and cooling. These efficiency improvements will help reduce the electricity demand and assist in balancing electricity supply. In order to realise this benefit the Trust would urge the NIC to recommend that the renewable heat incentive (RHI) is retained so that this nascent technology can be deployed more widely and possibly assist with the energy requirements of Crossrail 2.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

No comments

4a. What is an appropriate local and regional contribution – given the potential distribution of benefits to business, residents, transport users and the wider economy – and how could this be achieved?

No comments

4b. What innovative funding mechanisms could be considered to support delivery of key schemes?

No comments

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

No comments

Response by Canary Wharf Group to National Infrastructure Commission

0 Summary

0.1 Canary Wharf Group Limited (CWG) is pleased to respond to the call for evidence from the National Infrastructure Commission (NIC) on London's future transport infrastructure. The key points are:

- According to the London Plan, London's housing growth will be primarily focused in east and south east London, highlighting the need for additional transport infrastructure to improve access to areas, particularly those adjacent to the Thames on both sides of the river
- Even with planned rail improvements, there is still a need to enhance orbital rail routes/capacity as a means of providing a better alternative to road travel across Greater London as a whole and also reducing pressure at Central London termini and interchanges
- Crossrail 2 is supported as a means of providing additional rail capacity, but in its original north east – south west orientation.
- The costs of Crossrail 2 could be reduced by:
 - reviewing the alignment in south west London and restricting tunnelling to the section north of Clapham Junction
- The benefits of Crossrail 2 could be enhanced by:
 - extending services in the north to Stansted
 - providing a new eastern branch to serve London Riverside
- Other priorities for transport investment include:
 - New road/rail river crossings east of Tower Bridge
 - Improved orbital and radial road capacity
 - Extension of Crossrail 1 to Ebbsfleet, subject to further capacity studies and provision of at least 30 trains per hour through the Isle of Dogs
 - Further extension of the Bakerloo Line (over and above the recently announced extension to Lewisham) to include a route through Surrey Quays, the Isle of Dogs (and potentially beyond to open up areas adjoining the Thames including the Greenwich Peninsula and Charlton Riverside for housing growth and other development), linking a string of Opportunity Areas identified in the London Plan 2015
 - ensuring road capacity and accessibility meets the needs of essential servicing / delivery vehicles, buses and cyclists.

0.2 CWG would welcome further discussion with the NIC on the ideas presented in this response.

1 Introduction

- 1.1 This evidence for the National Infrastructure Commission (NIC) on London's future transport infrastructure is prepared by Canary Wharf Group Limited (CWG).
- 1.2 CWG is keen to ensure that over the next 30+ years existing and future transport infrastructure will support the Greater London Authority's ("GLA") and Transport for London's ("TfL") objectives as set out in the London Infrastructure Plan 2050: to ensure the foundations for London's continued success as a Global City; to help house a growing London; to support a better, not just bigger, London; and to innovate to develop a transport system of tomorrow.
- 1.3 CWG feel that infrastructure investment should facilitate the maximisation of development potential in the Opportunity Areas (OAs) identified in the London Plan 2015, in particular those in east and south east London.
- 1.4 We recognise that the Commission will not consider opportunities related to airport expansion, and have borne this in mind in preparing this response. We note though that when a decision is made, important choices will need to be made on the locations of transport infrastructure, to ensure flexible services are provided serving all of London's airports and potential expansion locations.
- 1.5 We note that the Commission is not currently tasked with looking at ways to reduce the need for major capital projects by better use of existing and future capacity. Technology and other measures should be explored to achieve better use of infrastructure capacity.
- 1.6 The response is set out as follows:
 - **Section 2** – London and its hinterland – major economic and social challenges
 - **Section 3**- Strategic large-scale transport options, including commentary on potential funding
 - **Section 4** - Crossrail 2 - improving the cost: benefit ratio.

2 London and its Hinterland - Major Social and Economic Challenges

High population and employment growth

- 2.1 The key transport infrastructure challenges, and underlying trends such as population and employment growth have been researched by the GLA and TfL and other interest groups, notably within the London Plan 2015. The GLA predict that London's population could grow from 8.6 million in 2015 to potentially 13.4 million by 2050. The GLA also forecast that the number of jobs within London could increase from 4.9 million in 2015 to 6.3 million by 2041.
- 2.2 Actual growth in travel has also been greater than the forecasts in the Mayor's Transport Strategy (source: GLA London Infrastructure Plan: Transport Supporting Paper (2014)). This further highlights the need to proactively plan and implement substantial improvements to transport infrastructure, particularly to accommodate growth in public transport trips.
- 2.3 TfL estimates public transport trips could increase by up to 60% by 2050, based on projected population growth, with continuing trend mode shift from car use given increasingly dense patterns of development. This underlines the need for further major investment in public transport.

Housing demand

- 2.4 London's forecast population growth will need 49,000 additional homes each year, but only 30,000 are being completed each year. The Future of London's London 2050 workshop concluded "supply of housing [is] an enabling tool for economic growth in London. Housing, taken as a piece of infrastructure, is one of the most (if not the most) important risks to London's economy." Housing demand into the foreseeable future exceeds supply, resulting in high housing costs. Effective transport investment can help by improving connectivity with lower cost areas in London's hinterland, opening up new areas for development and facilitating densification within London.

Ageing population

- 2.5 The London Plan estimates that the number of people over 64 is projected to increase by 64% (nearly 580,000) to reach 1.49 million by 2036. The over 90s are expected to grow in number over the same period, by 89,000. This will require further investment in accessible public transport including flexible demand responsive services and use of vehicles with wheelchair access.

Reducing commuting times

- 2.6 London has the longest average commute time in the UK - 56 minutes per trip each day. Lower value housing areas located along the radial road and main line routes out of London are increasingly being used by commuters, leading to transport infrastructure capacity constraints.
- 2.7 Transport investment should increase capacity on strategic routes, particularly underground and rail routes and this should be combined with high density development around stations. It should improve service reliability, reduce overall journey times, reduce congestion at terminal stations and improve interchange opportunities outside Central London.

Transit-oriented development

- 2.8 London needs higher density development around public transport nodes and increased public transport accessibility to redevelopment and regeneration areas. The focus for investment should be to unlock and raise the cap on development potential, especially within the Opportunity Areas and Areas for Intensification identified in the London Plan, potentially generating greater surplus value to help fund infrastructure delivery.

3 Strategic Large-Scale Transport Options

Priority Rail and Underground Schemes

- 3.1 Key rail and underground network interventions should improve capacity and connectivity within London and on radial links with its hinterland. These should be combined with strategic interchanges between radial and orbital routes to reduce pressure at terminal stations. National Rail's corridor upgrades as shown in the 2050 London Infrastructure Plan should be a priority for funding.
- 3.2 CWG supports Crossrail 2 in principle, as it opens up important connections needed to allow London to grow. However the planned scheme does not tackle the transport challenges outside central London/West End, nor does it address London's Opportunity Areas very well. Therefore, it needs to be complemented by new rail capacity to improve connectivity between and to other key centres of employment and major new development – the City, Canary Wharf (incl. Poplar and Isle of Dogs), City in the East/Tilbury Port, Euston/Kings Cross/St Pancras and Old Oak Common/Wembley.
- 3.3 CWG ask that the Commission consider in more detail the following rail, DLR and underground improvements that meet the strategic objectives by improving both accessibility and connectivity. Prioritisation should be given to schemes which provide improved connectivity, in particular reliability and speed of journeys and which unlock the delivery of housing and jobs within London:
- Crossrail 1
 - provide a new link to the West Coast Mainline from Old Oak Common
 - extend services east to Gravesend and Ebbsfleet, to provide interchange with HS1 services, subject to further capacity studies and provision of at least 30 trains per hour through the Isle of Dogs
 - Crossrail 2 (see more detail in section 4)
 - consider fuller scheme, with extensions to Stansted airport and to Barking Riverside / City in the east (supporting major housing development)
 - simplify scheme in south west London to reduce tunnelling costs
 - take over a Crossrail 1 branch as part of Crossrail 2, providing an interchange station between Crossrail 1 and 2 at Liverpool Street/Shoreditch and seek to avoid problems of turning trains and imbalances associated with Crossrail 1
 - Further east-west rail capacity in the areas adjoining the River Thames in east London in order to support development e.g. Crossrail 2 branch and/or Bakerloo line extensions
 - Bakerloo line extensions over and above the recently announced route from Elephant & Castle to Lewisham, to open up areas of development on the north as well as the south side of the river and improve transport capacity and resilience in east and south east London
 - A new Brighton – Gatwick – Stansted rail link via East London, interchanging with Crossrail 1 and Crossrail 2
 - New orbital rail routes including routes using new river crossings east of Tower Bridge with enhanced interchanges outside Central London, to improve peripheral connectivity and reduce congestion at main termini, such as extensions to the London Overground and improvements to interchange at locations such as Lewisham

- Upgrade main termini to improve passenger experience and reduce congestion
- Increase central /suburban rail capacity - through selective interventions, including capital investment and increasing train lengths.
- World class tube – fund signalling improvements and removal of congestion points to increase running capacity to at least 36 trains per hour on all routes
- Provide Northern Line Extension from Battersea to Clapham Junction
- DLR improvements including:
 - General capacity enhancements, improved service frequencies and upgraded stations
 - An extension from Bank to Euston, including a new station at Tower Hill (to facilitate closure of the Tower Gateway branch)
 - Further extensions to key centres such as Barking and Thamesmead.

Priority Road Schemes

3.4 CWG considers there is a need for a bold approach and agreement to a programme of schemes designed to bring London’s road network up to date including consideration of tolls, road pricing applied to all road users as well as extending the Congestion Zone in order to help fund improvements. Priorities for capital investment in road schemes should focus on providing and improving key links in the road network to improve connectivity, capacity, reliability and journey times, particularly for buses and essential servicing and delivery vehicles. It is particularly important to provide additional Thames crossings east of Tower Bridge to link the OAs in east London, north and south of the river, to maximise development capacity and improve economic synergies in the key development opportunity in London. Priority schemes include:

- Thames crossings in east London, notably at Gallions Reach
- Improved Orbital Routes, such as enhancements to the North and South Circular Roads:
- Underpasses / tunnels (to enhance capacity and improve urban realm), such as a link from the A13 to the A4 via Central London.

Key Funding Priorities

3.5 CWG ask that the Commission gives further consideration to several schemes which appear to offer the best outcomes relative to the GLA’s strategic objectives:

- Crossrail 1 extensions, particularly to Ebbsfleet and the West Coast Main Line
- Crossrail 2 extension to open up access to London Riverside
- Further extensions of the Bakerloo Line to serve planned regeneration areas and Opportunity Areas either side of the River Thames in East London.

Potential Funding Approach

3.6 London has an established framework for strategic spatial and transport planning, through the London Plan and the supporting Mayor’s Transport Strategy. The London 2050 Infrastructure Plan consultation sets the context for the development of the next London Plan and MTS.

3.7 It is imperative that strategic planning, and the infrastructure priorities that stem from this are supported by a long-term, consistent and sustainable funding stream. This means London needs more control over long-term funding and financing of strategic infrastructure.

- 3.8 The principle that the beneficiaries of major investment (people and businesses in London) should fund investment is compelling, and will ensure greater buy-in to infrastructure investment. Fiscal devolution would enable this, and remove some of the political uncertainty of major infrastructure decisions being made by Treasury, where long-term investment could be subject to political risk based on the false perception that investment in London is at the expense of other areas.
- 3.9 CWG support the ambition towards greater fiscal devolution of business rates and property tax revenues. Local income taxes are another option, which we think should apply regionally rather than just in London (as so many in the south-east commute into London, shop and use other services here).
- 3.10 In considering rail investment specifically, we note the recent successes of public/private approaches in London, including:
- Over-station development funding new stations, e.g. Crossrail 1 at Canary Wharf
 - Development cross-funding the provision of the station box at Woolwich Arsenal Crossrail 1 station
 - The anticipation that the Northern Line Extension from Kennington to Battersea Power Station will be fully funded by developments in the Vauxhall Nine Elms and Battersea Opportunity Area.
- 3.11 In considering road investment specifically, we also support the principle of road user charges to better manage London's road network (with tariffs allied to congestion) and to fund vital new road infrastructure. This would be more equitable than the current road tax and fuel duty.
- 3.12 In view of the desire to discourage private vehicle use, funding priorities should be focussed on increasing capacity on rail, DLR, tram and underground services, to open up new areas for housing and development, as well as addressing existing capacity constraints. Nevertheless, funding for roads should also be made to ensure sufficient capacity is provided for the needs of essential servicing / delivery vehicles, buses and cyclists.
- 3.13 Infrastructure providers should also consider ways for development opportunities, such as major housing schemes, to cross-fund new infrastructure.

4 Crossrail 2 – Improving the Cost: Benefit Ratio

Commentary

- 4.1 Crossrail 2 is currently proposed by TfL as a scheme linking Epsom and other locations in south west London with Broxbourne in Hertfordshire and New Southgate in north London.
- 4.2 Although a strategic north-south link will help London to grow and relieve congestion on key underground lines and at Network Rail termini, the proposed scheme misses the opportunity to help open up major housing and employment sites in east and south east London. It also does not serve major destinations such as Stansted Airport.
- 4.3 In south west London, there appears to be duplication with existing suburban services terminating at Waterloo. While possibly relieving congestion, this will add to operational complexity. The tunnelling options in south west London / Chelsea seem to be unnecessarily circuitous and lengthy. Consideration should be given to reviewing the proposals in south west London and providing the tunnel portal closer to Clapham Junction.
- 4.4 Crossrail 2 supports development of 200,000+ new homes along its alignment. It increases capacity between Clapham Junction and Euston, reducing pressure on the underground (especially the Northern and Victoria Lines) and freeing up track and platform capacity at Waterloo and Victoria stations. Connectivity is improved by new interchanges:
- **HS1** - at Euston/ St Pancras
 - **Crossrail 1** - at Tottenham Court Road
 - **Thameslink** – at Euston/ St Pancras
 - **Suburban routes - south** - at Wimbledon /Clapham Junction
 - Suburban routes - north - Tottenham Hale.
- 4.5 It is essential that the new interchanges are designed with sufficient capacity to comfortably handle anticipated passenger flows. This is particularly important at Tottenham Court Road where Crossrail 2 would interchange with Crossrail 1, the Central Line and the Northern Line and the expected numbers of interchanging passengers will be very high.
- 4.6 As currently proposed, Crossrail 2 would provide the primary route to Canary Wharf from the majority of south west London, with passengers interchanging onto Crossrail 2 at Tottenham Court Road. It would provide comparable journey times to the current route via Waterloo and the Jubilee Line, although waiting times for Crossrail 1 at Tottenham Court Road would be longer than those for the Jubilee Line at Waterloo.
- 4.7 10% of Canary Wharf employees currently pass through Waterloo, which the ‘Office of Road and Rail’ recently identified as Britain’s busiest rail station (99.2m entries/exits between 1 April 2014 and 31 March 2015). Recent analyses of TfL Railplan data by CWG have also highlighted that the Jubilee Line is likely to experience increasing congestion in the future in the absence of Crossrail 2. Therefore, CWG sees Crossrail 2 as important for providing journey choice and resilience and reducing waiting times for passengers joining the Jubilee Line at busy times, notably at London Bridge in the morning peak period, especially when Thameslink 2000 is fully operational.
- 4.8 The need to interchange at Victoria mainline station would also be reduced, which is currently Britain’s second busiest mainline station (85.3m entries/exits between 1 April

2014 and 31 March 2015). Particularly in the shorter-term, Crossrail 2 is also likely to relieve the Victoria Line and the Charing Cross branch of the Northern Line.

- 4.9 It is important that real-time information for all key routes is provided on trains on all lines including Crossrail 1, Crossrail 2 and the Jubilee Line. This will ensure that passengers can make informed decisions about which routes to use and where to interchange, based upon up-to-date knowledge of operating conditions and train occupancies.

Suggested improvements

- 4.10 CWG considers that the effectiveness of the current Crossrail 2 proposals could be improved as follows:

- Provide a branch from Euston/St Pancras to east London taking over the Crossrail 1 branch to Shenfield with a Crossrail 1/Crossrail 2 passenger interchange at Liverpool Street/Shoreditch. This would enable the Abbey Wood branch of Crossrail 1 to run with up to 30 trains per hour and would provide more rail capacity to and through the Isle of Dogs and Opportunity Areas in east and south east London
- Subject to further detailed capacity studies and provision of 30 trains per hour through the Isle of Dogs, it would be possible to extend Crossrail 1 to connect with HS1 services at Ebbsfleet and assist with regenerating North Kent Thameside
- If Crossrail 2 were to take over the Shenfield branch, it may also be possible to build another Crossrail 1 branch east of Custom House possibly taking over all or some of the c2c lines. This would support major housing development areas and higher density development in the east London Opportunity Areas including the Isle of Dogs, Royal Docks and London Riverside
- Extend Crossrail 2 services to serve Stansted Airport. This would significantly improve connectivity between central London/ City /east London and Stansted Airport and between Stansted and Heathrow as well as increasing the housing and employment development potential in the Upper Lee Valley Opportunity Area and beyond.
- Relocating the tunnel portal nearer Clapham Junction. This would reduce the costs of the route in south west London.

Infrastructure for a physically active nation

Submitted by Dr. Angie Page and Jess Read MSc., Centre for Exercise, Nutrition and Health Sciences, University of Bristol

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Jess Read holds a MSc. in Nutrition, Physical Activity and Public Health with distinction from the University of Bristol. She has worked for 15 years as an urban planner delivering innovative “liveable cities” projects for cities such as Copenhagen, New York, Shanghai, and London typically using urban flood mitigation to co-finance walking and cycling infrastructure upgrades. She currently works at the Centre for Exercise, Nutrition and Health Sciences at the University of Bristol.

Physical inactivity is estimated to cause 17% of deaths¹ and costs the nation £20 billion per year². The government ambition set out in “*Moving More, Living More*” is for a more physically active nation with all the potential health, social and economic benefits this can provide³. National physical activity and transport surveys provide clear evidence that transport is one of the most important sources of physical activity for both adults and children⁴. UK policy endorses that transport should assume physical activity delivery as a primary objective⁵.

UK levels of physical activity are low for adults and children⁶. This disproportionately affects women and girls. For example, there are currently over 10 million adult women in England alone who do not achieve the national physical activity guidelines of 150 minutes of moderate-to-vigorous physical activity per week⁷. Gender inequity is evident across physical activity settings, socio-economic categories and age⁸, indicating that a gendered approach to facilitating physical activity is necessary to equally include women. As such, **walking and cycling infrastructure must be designed specifically to meet women’s needs present and future as walking is their single most important source of physical activity.**

Pedestrian and cyclist safety in England is poor in both absolute and relative terms. The rate of killed or seriously injured per billion miles is almost 20 times higher for pedestrians than car occupants (484 vs. 25 respectively) and 43 times higher for cyclists than car occupants (1080 vs. 25 respectively)⁹. These rates are 3 to 10 times higher than absolute traffic injury rates of European counterparts such as Sweden, Denmark and the Netherlands, and up to 19 times higher when comparing rates for children¹⁰. Even allowing for the methodological limitations of traffic injury rates per distance travelled, this international data clearly suggests that our national traffic safety ambitions can be improved. Many cities across the world are adopting **zero accident targets for pedestrians.**

The economic case for infrastructure investment can not be made effectively without considering impacts on health. This is equally true for all areas of England including the north.

To this end, the following actions should be embedded as part of the national infrastructure strategy.

- 1) The inclusion of walking and cycling infrastructure within the infrastructure plans at a scale sufficient to facilitate measurable population increases in physical activity year-on-year in line with UK policy and the national physical activity ambition and Chief Medical Officers' national physical activity recommendations for both adults and children.
- 2) Ensuring that design and access to new walking and cycling infrastructure is open to currently underserved groups, particularly women and girls.
- 3) New planned infrastructure will deliver improvement in safety for pedestrians and cyclists measured in absolute terms as killed or injury per distance travelled, with a progressive goal towards zero deaths and serious injury for pedestrians and cyclists.
- 4) Further development of economic costs for different forms of travel in relation to economic, societal, climate and health benefits. This should include assessment of impacts on health, health costs, productivity, local spending, congestion, accidents, and air pollution.

This is an incredible opportunity to put physical activity and the nation's health at the heart of this national infrastructure investment strategy. This is the type of joined-up, innovative response widely recognised as necessary to increase population levels of physical activity and reduce disease risk both of which contribute directly to economic prosperity.

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² Cabinet Office (2014) *Moving More, Living More Annexes*.

³ Ibid.

⁴ Based on data from national physical activity surveys: Active People Survey 7/8 and 8, Health Survey for England 2012, National Travel Survey 2013, National Census 2011.

⁵ Cabinet Office (2014) *Moving More, Living More Annexes*
Cabinet Office (2014b) *Inspired by 2012: The legacy from the Olympic and Paralympic Games*; Department of Health (2011) *Start active, stay active: a report on physical activity for health from the four home countries' Chief Medical Officers*; Department of Health (2013) *Living Well for Longer: A call to action to reduce avoidable premature mortality*; Department of Health (2015b) *Living Well for Longer: One year on*; Department for Transport (2013) *Action for Roads: A network for the 21st century*; Department for Transport (2013b) *Briefing on the Government's ambition for cycling*; Department for Transport (2014b) *Door to Door Action Plan: Progress Report*; HM Treasury (2014) *National Infrastructure Plan*; NICE (2015) *Physical activity overview*; Public Health England (2014). *Everybody active, every day: An evidence-based approach to physical activity*.

⁶ Based on data from national physical activity surveys, see reference 4 and: Cooper, A., Goodman, A., Page, A., *et al.* (2015) 'Objectively measured physical activity and sedentary time in youth: the International children's accelerometry database (ICAD)', *International Journal of Behavioral Nutrition and Physical Activity*, 12(113). DOI: 10.1186/s12966-0150274-5.

⁷ Calculated as 22,350,450 adult women ≥ 16 year * 45% not accumulating the Chief Medical Officers' guidelines of 150 minutes of moderate-to-vigorous physical activity per week = 10,057,703. Data for population in England from Office for National Statistics (2013); Data for prevalence of adult women not meeting the Chief Medical Officers' guidelines from the Health Survey for England 2012.

⁸ Consistent across national physical activity surveys, see reference 4.

⁹ Department for Transport (2015) 'Relative risk of different forms of transport, Great Britain: 2014, Table RAS30070.

¹⁰ DTU Transport (2012) *Risiko i trafikken*; Official Statistics Sweden (2014) *Road Traffic Injuries*; Official Statistics Sweden (2014b) *The Swedish national travel survey 2012–2013*; SWOV (2013) *Fact sheet: risk in traffic*; Wiklund, M. (2015).

Introduction

Over the past decade we have seen infrastructure creep up the agenda to a point that it is now firmly placed at the heart of the political debate. With investment in major transport, energy and utility projects increasing to record highs and the development of the National Infrastructure Plan to set out key Government priorities, we have reached a stage where infrastructure is a nationally significant issue that transcends party political ties.

The formation of the National Infrastructure Commission last year was greatly welcomed by the industry and provided a great level of confidence in the deliverability of major projects and enables the current Government and future administrations to speed up decision-making on vital transport, energy and housing programmes that Britain needs to continue to grow its economy.

CH2M is a global engineering and programme management company that works in the areas of areas of water, transportation, environmental, energy, facilities and defence. With over 2,500 people employed in the UK, CH2M is currently working on some of the most iconic infrastructure programmes including Crossrail, High Speed 2, Thames Tideway Tunnels, Crossrail 2, the decommissioning of Dounreay and was one of the leading partners in CLM, Delivery Partner to the ODA for the London 2012 Olympic & Paralympic Games.

Given our experience of working on the development and delivery of major UK infrastructure projects, we felt it may be helpful to share some of our thoughts around the points laid out in the NIC's call for evidence in order to share the lessons learned for the efficient delivery of future infrastructure priorities. In particular, this document presents our views for large-scale transport infrastructure improvements in London. We have made separate submissions outlining our views for infrastructure priorities for northern cities and electricity interconnection and storage.

Large-scale transport infrastructure improvements in London

Q1 – What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

In order for London's economy to continue to thrive and be globally competitive, London will need a step change in investment over the next thirty years that not just upgrades existing infrastructure but catalyses the city's growth through intensification of development in opportunity areas outside the central core.

The dense clustering of businesses in the centre creates synergies (agglomeration benefits) that make Inner London one of the most productive regions in Europe¹. These synergies are dependent on a network that efficiently moves millions of people per day to and from their place of work. Despite technology being available for employees to work remotely, strong demand for office space in Central London demonstrates that being physically present is as important as ever and the need to move large numbers of people to and from their places of work will likely persist.

London's robust economic growth, urbanisation and growing population is expected drive demand for additional transport capacity over the next three decades. London's transport stakeholders have risen to the challenge by delivering major projects such as Crossrail 1, Thameslink Programme and the Tube upgrade programme, which will provide London's residents with substantial improvements in capacity and connectivity across the network. Yet the capacity that these programmes deliver will not be sufficient to meet all of the expected demand. As London expands spatially and economically, further large-scale transport investment will be needed to deliver capacity on radial corridors that connect orbital routes to new urban employment centres while enhancing connections to the commuter hinterland. This will involve the proposed Bakerloo extension and Crossrail 2 to connect less well connected areas in the boroughs in the north, south east and south west where there exists potential for higher densities of housing and employment around transport interchanges.

As a global city, London's future competitiveness depends on being able to continue to attract and retain a high quality labour force which allows the city to sustain growth over the long-term. The cost of housing is a major challenge for London which leads to higher wage bills for employers and forces many of London's residents to move further out into the commuter hinterland to find affordable housing or migrate away from the city.

¹ Eurostat, 2015, Regional labour market statistics – GDP per person employed, NUTS2 level (2012 data)

Best-practice urban planning emphasises the importance of good public transport accessibility for the development of higher density housing. This allows residents to access their place of work within a reasonable journey time, and minimises the negative economic and environmental impacts of road congestion. Inevitably the Opportunity Areas where new homes are planned, many of which are located in outer boroughs, have lower levels of transport connectivity. To make these developments viable, London will need new high-quality rail links which connects these locations to employment centres in inner boroughs, and to ease congestion on existing routes.

Q2 - What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

CH2M's experience of evaluating and delivering some of London's largest transport infrastructure programmes informs us of the importance of closely aligning the timing of planned infrastructure improvements with strategic objectives. This involves prioritising transport projects such that their timing maximises economic benefits for the areas they serve and anticipating infrastructure requirements for the development of specific Opportunity Areas.

The Mayor's London Infrastructure Plan sets out the infrastructure projects that London will be required up to 2050 in order to sustain economic growth, maintain London's global competitiveness and provide for London's housing and employment land needs. However, a consideration for how these projects should be prioritised is not explicitly covered in the plan. Over the short to medium term, projects such as the Tube upgrade with clear benefits in terms of capacity, reliability and journey times should be prioritised, but over the longer-term this will not be sufficient to meet growing passenger demand and to relieve congestion. This is why larger scale projects such as Crossrail 2 and the Bakerloo Line Extension are being planned to deliver a step change in capacity.

Beyond providing extra capacity, further strategic and economic considerations must be taken into account. The London Plan sets out a spatial development strategy which focusses on the densification of urban centres with good transport links and the development of Opportunity Areas where there exists significant capacity to build new housing and employment space taking into account London's urban form which is bounded by a protected green belt. London's future development requires transport infrastructure with frequent, high capacity radial and orbital rail links to provide connectivity between these Opportunity Areas, to the urban core and to the commuter hinterland.

Some Opportunity Areas will develop with minimal public sector intervention while others will require substantial investment in essential infrastructure in order to be viable. This includes the Upper Lee Valley where it is recognised that a major improvement in transport accessibility via Crossrail 2 will be needed to unlock its housing potential. The Thames Gateway is another area with huge potential for residential development. However, over the years London's policy framework has not been able to unlock the full potential of the land. This points to the need for additional transport infrastructure beyond proposed schemes such as an extension of the DLR network in order to enable development in this area.

A key issue facing London in the future will be to find the space to accommodate a workforce that is expected to increase by one million over the next two decades². More people will put substantial pressure on London's already strained road network and pedestrian walkways, particularly in Central London. The historic layout of the city centre means that there is limited scope to expand road capacity. Strategy will therefore need to consider options that allow more efficient usage of existing roads, cycleway and pedestrian walkways supported by investment in smart road signalling technology and expansion of the cycle rental scheme and the cycle superhighways network.

Q3 - What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

CH2M is currently advising TfL on the business case for Crossrail 2 (CR2) which restricts our ability to provide detailed comments specifically about the costs and benefits of that scheme.

More generally, the DfT transport appraisal guidance (WebTAG) provides a robust and comprehensive framework that is comparable to the best in the world³. Recent changes have seen wider economic benefits appraised as part of the framework alongside direct transport user benefits. This represents a major step forward for the appraisal of major transport projects. However, it is acknowledged by the DfT that in some circumstances, the appraisal framework does not fully capture the economic growth impacts of transport projects⁴, particularly large projects

² GLA Economics, 2015, Updated employment projections for London by sector, Greater London Authority.

³ Mackie, P. and Worsley, T., 2013, International Comparisons of Transport Appraisal Practice, Institute for Transport Studies, University of Leeds.

⁴ Department for Transport, 2013, Understanding and Valuing the Impacts of Transport Investment, DfT.

such as HS2 and Crossrail 1 that are expected to change the economics of private investment in areas along the route, and produce regional and national level economic growth impacts.

Major transport schemes provide not just transport benefits but also support sustainable economic development, housing development and regeneration. CH2M's experience working across development and infrastructure sectors including water and energy underlines our view that it is important to adopt a holistic approach to evaluating infrastructure investment which takes into account all the transport and economic benefits of proposed schemes. These benefits are not currently quantitatively evaluated as part of the WebTAG framework but methodologies have been developed by other Government departments including DCLG for valuing the impacts of transport schemes on additional housing supply and land values. This points to the critical need for cross-departmental appraisal guidance, which follows the principles of the Green Book and the subsequent Five Case model, and importantly takes into account the various non-transport based economic externalities facilitated by transport investments.

From CH2M's own experience in delivering some of the UK's largest infrastructure projects, and reflected in DfT's 2014 commissioned report⁵ on how to extend and improve appraisal techniques in order to fully capture economic impact of transport investments, it is acknowledged that new techniques will be needed to fully account for the all economic impacts of projects such as Crossrail 2. This will involve quantifying the 'real economy' impacts of proposed interventions, covering the interactions between infrastructure, land use and spatial development. This will require using models that predict changes in land use associated with the transport intervention and the resultant uplift in land value, as well as Spatial Computable General Equilibrium (S-CGE) models, which has been used in support of our work for Lower Thames Crossing, that measure the true impact of strategic transport investments at regional and national economies.

Regarding the scheme's costs, we are of the opinion that adopting innovative contracting methods and programme management techniques, like those introduced by CH2M for delivering critical infrastructure associated with the London 2012 Olympics, could bring some efficiencies. In particular, such approaches could encourage contractors to deliver and share cost efficiencies during the delivery stage. They could also enable the programme to roll on and off the contractors responding to the changing need over different delivery phases.

Q4 - What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

CH2M is currently advising TfL on the business case for Crossrail 2 (CR2) which restricts our ability to provide details regarding the proposed funding arrangements of that scheme.

That said, the funding and financing options for Crossrail 2 have been explored in the *Funding and Financing Feasibility Study*⁶ undertaken for TfL by PwC. This includes examining the potential of using funding mechanisms employed by Crossrail 1 and Northern Line Extension (NLE). In the case of Crossrail 1, local funding was raised from a Mayoral Community Infrastructure Levy (CIL), Section 106 developer contributions, a business rates supplement for Greater London and the sale of land and property used during the delivery phase along with major contributions from Canary Wharf Development Group and Heathrow Airport Ltd. The Northern Line Extension receives funding from long-term business rate increments and a proportion of borough-level CIL and S106 receipts related to new developments in the Vauxhall Nine Elms enterprise zone.

Compared to Crossrail 1, where large sections run through the city centre, the benefits of Crossrail 2 are expected to be more broadly distributed across London's businesses, residents, transport users and the wider economy. This will mean a different funding package will be needed relative to Crossrail 1. This could include section 106 developer contributions, the extension of the Mayoral CIL and introduction of borough-level CILs to capture value uplift in areas substantially affected by the scheme. The funding package will also need to consider other options which were not possible for the Crossrail 1 funding package.

One option that would have important benefits for transport infrastructure funding would be the devolution of some taxation powers to London. London is more dependent on central government funding and has much lower levels of fiscal autonomy than other major international cities such as New York or Paris. A 2013 report commissioned by the London Finance Commission⁷ shows that London collects the lowest municipal taxes per

⁵ Laird J., Venables J. and Overman H., 2014, Transport investment and economic performance: Implications for project appraisal, DfT.

⁶ PwC, 2014, Crossrail 2 Funding and Financing Study, TfL.

⁷ University of Toronto Institute on Municipal Finance and Governance, 2013, 'International Comparison of Global City Financing', London Finance Commission.

capita amongst seven major city comparators. Only 26.2% of London's funding comes from own-source revenues compared to 82.5% in Paris. This limits London's autonomy to be able to fund and finance large-scale transport infrastructure improvements in the capital and make strategic decisions regarding investments.

Private financing has been used successfully for the Thames Tideway Tunnel using a regulated asset base model, whereby the finance costs are covered through the regulatory system. An adapted approach could be used by Crossrail 2 to secure private finance by issuing bonds which would be repaid by the Mayoral CIL and Business Rate Supplement. This would be a departure from previous rail financing mechanisms, which have involved either the DfT, GLA or TfL securing loans from public sector sources such as the Public Works Loan Board which are repaid through fares or the business rate supplement. However, a private finance approach may provide advantages through transferring a portion of the risk away from the public sector.

Capturing land value uplift attributed to improved transport accessibility in station catchment areas could provide an alternative funding stream if it can be captured through Stamp Duty Land Tax and Council Tax increments. A report by GVA⁸ predicts that Crossrail will increase residential capital values around stations on the route by between 20% and 25% up to 2021. Capturing such increases in capital values will of course be dependent on the regional devolution of powers to collect this revenue.

The current council tax system (where bands are set using 1991 property values) makes it difficult for increases in tax revenues to be captured and directed towards funding major transport infrastructure. In the Netherlands, capturing land value increments are made easier through a local property tax which is calculated as a percentage of the real (inflation adjusted) value of the property.

A further possible step would be the removal of TfL borrowing limits while retaining prudential borrowing rules. This would have the effect of improving flexibility to fund major transport schemes. Fiscal devolution could also provide financial incentives for boroughs to take difficult planning decisions, which would benefit from retaining some of the increases in tax revenues. More flexibility on borrowing limits would also allow TfL to replicate the example of MTR (Hong Kong's metro operator), which develops the assets above and around underground stations into commercial and residential schemes in coordination with city authorities. MTR uses revenues from these investments to fund the cost of expanding the metro network. In areas where Crossrail 1 stations already exist such as Tottenham Court Road, land value capture could be maximised through strategic location of station entrances. While it is acknowledged that there are substantial differences between London and Hong Kong which makes the comparison difficult, most notably the fact that all land in Hong Kong is owned by the authorities, there does exist an argument around the more effective development of TfL assets, and this could be facilitated through greater borrowing freedoms for TfL and the GLA.

⁸ GVA, 2012, Crossrail Property Impact Study, Crossrail.



Submission by the Chartered Institute of Logistics and Transport

to the

National Infrastructure Commission call for Evidence:

London's transport infrastructure

Introduction

The Chartered Institute of Logistics and Transport (“the Institute”) is a professional institution embracing all transport modes whose members are engaged in the provision of transport services for both passengers and freight, the management of logistics and the supply chain, transport planning, government and administration. Our principal concern is that transport policies and procedures should be effective and efficient, based on objective analysis of the issues and practical experience, and that good practice should be widely disseminated and adopted. The Institute has a number of specialist forums, a nationwide structure of locally based groups and a Public Policies Committee which considers the broad canvass of transport policy. This submission has been prepared by the Institute’s London and South East committees.

1 What are the major social and economic challenges facing London and its commuter hinterland over the next two to three decades?

- 1.1 Continuing population growth due to migration from other parts of the UK, Europe and beyond, increasing life expectancy and increases in younger populations.
- 1.2 Acute accommodation shortages and/or major expansion of housing stock requiring major increases in transport provision (bus and all forms of rail) to meet the demand for ever longer commuting journeys.
- 1.3 Changes to personal mobility patterns due to driverless personal transport which could have major implications for transport requirements as well as causing major difficulties for road capacity and parking provision in congested areas. NB the technology is as yet unproven and could be of little use where there is conflict with pedestrians, cyclists and other non-automated road users.
- 1.4 Changes to relationship between UK and Europe and break up of UK could have a huge effect on the viability of London and the south East which could cause either a strengthening or serious decline in the importance of London as a world

class centre. The result of the European Referendum could lead to major changes to London's importance in the world that at this stage are difficult to quantify.

1.5 Technological changes that could disperse working locations, particularly the increase in homeworking although effects of this on commuting are as yet relatively limited.

1.6 Increasing inequality, which risks resulting in options for funding transport enhancements through charges or higher fares being rejected as unfair and politically infeasible.

2 What are the strategic options for future investment in large-scale transport infrastructure improvements in London – on road, rail, and underground – including, but not limited to Crossrail 2

2.1 The options will depend on where the increase in the housing stock and in workplaces to accommodate the projected growth in London's population and employment is to be built.

2.2 Material increase needed in road and rail capacity on a number of routes within around Greater London. Currently capacity constraints are particularly acute on lower Thames river crossings as well as a number of key trunk routes in the South East and London. Whilst alternatives to car use and road freight transport need to be constantly sought to minimise the need for road capacity expansion it has to be accepted that free commercial traffic movement on key routes is essential for local, regional and the national economy.

2.3 Improved freight capacity and facilities needed within London and wider south East to cater for population increases, changes to travel patterns brought about by technological changes, particularly the move to online ordering and delivery. Transshipment between trunk and local movements will be essential both within road transport and between sea, rail and road. Ways of increasing non-road freight route capacity need to be found which could be around rather than across London. Ways would also need to be found to attract freight operators towards routes where there is greater potential capacity as opposed to routes already seriously constrained.

2.4 Future airport and runway decisions will have a considerable impact on transport flows in South East. Consideration needs to be given to developing other airports around London for freight and passenger movements (e.g. Stansted, London City, Luton and Southend) as well as the reopening of Manston, which could reduce traffic movements in critical areas of the road network. Building up some of these airports would also help strengthen local economies by improving local connectivity and job creation.

2.5 Greater use of River Thames and canal systems in and around London needs to be considered including what improvements to infrastructure are needed to make best use of these resources. The Thames can be used for passenger as well as freight flows. NB Wharfage has to be protected from high end housing schemes to allow future developments to happen.

2.6 Improvements to public transport in the areas outside the London boundaries would improve local connectivity and reduce car dependency which would reduce pressure on road and rail infrastructure within Greater London (See Section 6 below).

How should they be prioritised, taking into account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?

What might their potential impact be on employment, productivity and housing supply in London and the South East?

2.7 Assuming that the current demographic and employment trends continue housing supply throughout the south East will need to grow considerably although a change to London's economic performance could slow this down or even reverse the requirement although population increases are likely even if the economy weakens considerably

2.8 Automation and homeworking could reduce the pressure within London and encourage more people to live further out. They would also materially affect the transport network and future assumptions regarding network capacity.

2.9 Unless there is increased public and private investment there will be a considerable housing shortage for the foreseeable future

2.10 Both Transport for London and the Department for Transport have well-established decision-making processes set out in the respective organisation's Transport Business Case. Priorities should continue to be determined against these criteria.

3 What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme

3.1 Integrate as much as possible with existing rail infrastructure and any disused rail corridors still extant to minimize construction costs

4 What are the options for the funding, financing and delivery of large-scale Transport Infrastructure improvements in London, including Crossrail 2

- What is the appropriate local and regional contribution- given the potential distribution of benefits to business, residents, transport users and the wider economy- and how could this be achieved?

4.1 Better cooperation and integration of planning, infrastructure, housing etc. between Greater London and surrounding authorities (as per City Regions in rest of UK). Also closer working between the authorities outside Greater London.

- What innovative funding mechanisms could be considered to support delivery of key schemes?

4.2 Regional/local taxation

4.3 Road user charging and expansion of congestion charge – This will be vital if automated personal transport takes off

4.4 More effective use of developer contributions which could include a levy on developers in addition to or as an alternative to the current mixture of measures, some of which encourage wasteful spending by developers.

5 How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there lessons to be learned and applied in London?

5.1 Do European and other major Regional Transport Authorities provide a model for London to follow or does the London model work just as well?

5.2 Highway planning and management and bus services are dealt with differently outside the TfL area which inevitably constrains development. Funding in Shire and unitary areas is seriously constrained and getting ever more so year by year. This needs to be reviewed and changed if necessary.

5.3 UK Transport policy is based on the premise of maximising farebox contribution (usually involving annual fares increases at above-inflation rates) which is not the case in many other countries, particularly in Europe. The benefit of minimising subsidy against the extra capacity that would be required to accommodate demand from greater support levels needs to be reviewed and whether the provision of greater passenger transport capacity at more affordable fare levels and resulting increased usage would free up alternative road capacity for freight movement. There is also an affordability issue for lower paid workers who are paying a larger proportion of their income on transport in London than in major cities outside the UK.

6 General Comments and Points for Consideration

- 6.1 Clarity is needed on what constitutes London and what constitutes the south East and how far away from London the review should consider. For example improved transport links between Oxford and Cambridge, East Coast ports and the Midlands, along the south coast and between Kent and the Crawley/Gatwick/South London areas could all reduce vehicle and passenger movements into and out of London. What is good for London may not be good for the South East as a whole and vice versa. Transport needs, funding, provision, infrastructure and charging regimes should be less constrained by political boundaries. If current population trends and housing supply constraints continue people will continue to migrate outwards from London although transport affordability and in many areas, availability, raises a constraint to such outward migration as does an overloaded road and rail network.
- 6.2 Relative employment opportunities between London and the South East need to be considered as a whole with a view to spreading benefits to reduce the effects of overheating on the London economy and strengthening other economies that have suffered severe decline (e.g. south eastern seaside communities). This also needs to take into account the economies of regions throughout the UK and particularly within the northern super-region i.e. joined up thinking is essential for the UK as a whole.
- 6.3 Spending money on improved infrastructure in the South east may be more effective and deliverable as well as cheaper than directing the lion's share of expenditure into the Greater London area.
- 6.4 More clarity is needed as well as consistency within the region on what the priorities for transport related expenditure should be e.g.;
- Public v private transport and the role of cyclists and pedestrians
 - Passenger v. freight
 - The level of constraint on demand and desire for sustainable transport options
 - Road v rail and water
 - Airport capacity and locations
- 6.5 Other infrastructure considerations that have to be considered include;
- Funding the effects of climate related issues including coastal erosion from extreme weather (the current closure of the rail link between Dover and Folkestone is an example) or the loss of bridges, road damage etc. from flooding. These problems appear to be increasing due to the effects of global warming.

- The potential to damage to transport or other subterranean structures as a result of the increasing amount of below-ground building to provide additional residential capacity by building down rather than extending upwards which would be unlikely to receive planning permission. Planning regulations are probably the solution to this issue.

6.6 Overall Connectivity both within the South East and Beyond

- A high proportion of total transport movements between the UK and Europe travel through South east England and Kent in particular. As was seen in summer 2015 these movements are prone to major disruption whether due to industrial action, security issues or severe weather in the English Channel. Adequate capacity for freight transport to and from Europe is essential, particularly parking and driver rest facilities as well as provision of improved terminal facilities at other ports to allow for use by large ships when problems arise at the regularly used ports. Strengthening of rail capacity to the channel tunnel and ports is also needed (including around London to encourage trunk movements from the rest of the UK) to reduce the dependency on road networks. Continued development of North Sea and Thames Estuary ports with improved rail links should also be encouraged.
- As already alluded to outside the Greater London area public transport provision is generally to a much lower level, particularly on the majority of routes that are not rail-linked. Bus services are generally infrequent outside urban areas and often non-existent outside the core Monday to Saturday daytime period. The bus network (as well as the local charging regime) is almost entirely designed around what the commercial operators deem to be profitable that may or may not be the optimum network for a particular area and provision levels can vary considerably between comparable areas and bus operator groups. The road network is generally full to capacity at busy periods, Funding within non-metropolitan areas has been to traditionally lower levels than in London and is declining annually at an alarming level. If the current culture of car-dependency with its consequent resulting in an inefficient and environmentally questionable transport network is to be tackled a rethink is needed on how South Eastern England's transport network is funded and managed and how the planning system could be improved to reduce conflicting travel flows. The alternative will be a declining local economy due to the difficulty of moving freight and people around the South east and increasing inequality of movement for those without easy access to private transport.

- Regardless of London the South East is a very diverse area economically and demographically. There are a limited number of large cities but some major conurbations covering wide areas including the Brighton/Hove/Worthing conurbation, the Medway Towns, the South Thames side area, the Crawley/Gatwick/Redhill area and further afield the Solent area conurbation that includes Portsmouth, Southampton, Eastleigh, Fareham and surrounding areas. Transport links in and to and from these areas are in most cases poor when compared with comparable areas in other parts of the country as well as being heavily congested.

6.7 Whatever changes are made to discourage unnecessary movements within the Greater London area a balance has to be struck between the core London economy and the economies of the wider South East (and beyond). Evidence has been found (and which has been used to make the case for Crossrail 2) that productivity is higher in central London than elsewhere, even when differences in skills etc. are accounted for and concentrating high value employment in high cost areas generates income and revenue to fund the level of infrastructure needed in central London which would be unlikely to be justifiable anywhere else. Therefore a balance has to be struck between the differing economies in different areas. i.e. there is a need for joined up thinking that crosses political boundaries, business sectors, vested interests etc. that leads to decisions that benefit the UK as a whole as well as both London and the outer South east.

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January 2016

National Infrastructure Commission call for evidence, November 2015

**Memorandum from the City of London Corporation
Response to Question 3: London's transport infrastructure**

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

The City of London Corporation is committed to supporting and promoting the case for enhanced transport infrastructure, particularly in relation to rail services. As London's population grows and as the challenges of maintaining the Capital's status as a global city increase, a continuing programme of improvements will be needed to reduce congestion and free up capacity on rail routes serving the City of London and provide a stimulus to employment and housing growth in the London area.

The provision of adequate transportation infrastructure to cater for London's growing population and expanding employment base will continue to be a major challenge for the foreseeable future. Strong employment growth is already happening in the City of London; the City's local employment market is strong and total employment increased from 344,000 in 2008 to 414,000 in 2014. This is consistent with the aims of the London Plan 2015 and the City of London Local Plan 2015 which are both planning for significant office and employment growth and modest housing growth in the City of London by 2026. The range of office occupiers has broadened in recent years from its financial services base so that the City is now seen as an attractive business location for a wide range of companies. However, maintaining the City's competitive position as the world's foremost international business and finance centre is heavily dependent upon good transport links both within London and its commuter hinterland. In addition, the urgent requirement for additional housing in the London area will also increase the need for improved transport links between the suburbs and the central business district.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

Although various important transport projects, such as Thameslink and Crossrail, are under way, the legacy of many years' under-investment in the Underground and National Rail means that the additional capacity provided by these projects is likely to be fully utilised shortly after they open. Thus a continuing programme of rail capacity enhancements is required with a particular focus on improving the accessibility of areas with potential for major housing development such as the Lea Valley, Ebbsfleet, Barking Reach in the east and Old Oak Common in the west. Additionally from a business perspective there is a need to improve rail links to London's airports.

The City Corporation's priorities include:

Crossrail - This project will significantly improve east-west rail connections across London but the proposed train service pattern does not make full use of the new infrastructure, as a significant proportion of trains from the east will not travel beyond Paddington. The following measures are therefore recommended in order to maximise the value of the project:

- Extension of Paddington terminating trains to Tring/Milton Keynes on the West Coast Main Line via a new connecting line at Old Oak Common. This improves utilisation of the Crossrail tunnels, improves accessibility of the Old Oak regeneration area, provides new direct links to the West End and the City for commuters from north-west London and beyond and reduces the number of trains terminating at Euston (thus releasing capacity for HS2 and other services).
- Extension of Crossrail from Abbey Wood to Ebbsfleet and Gravesend to facilitate housing development in North Kent, particularly the development of Ebbsfleet Garden City.
- Provision of a direct fast Crossrail service between Heathrow T5, central London and Canary Wharf. Current proposals only provide for a stopping service between Heathrow T4 and central London which will not meet the requirements of many business travelers. This may require the amalgamation of Heathrow Express services into Crossrail.

West Anglia Main Line – Four-tracking the West Anglia Main Line is a key priority as it will allow a significant increase in capacity by separating fast and stopping services on this congested corridor. This will meet the long overdue need for faster and more frequent services to Stansted Airport and Cambridge and allow the provision of enhanced commuter services which will open up the potential for significant housing development around stations in the Lea Valley regeneration zone. Four-tracking is a necessary precursor to the future extension of Crossrail 2 services beyond Tottenham Hale.

Crossrail 2 - Although Crossrail 2 does not serve the City of London directly, it will boost the capacity and resilience of the central London public transport network and help to relieve overcrowding on key rail and Underground routes which do serve the City. This in turn will increase the attractiveness of the City and help to maintain its position as the world's leading financial and business centre. The key benefits for the City are:

- a reduction in severe overcrowding on Northern line;
- relief of congestion on suburban services into Waterloo;
- relief of congestion on suburban services into Liverpool Street;
- release of capacity at Liverpool Street through the diversion of some West Anglia suburban services onto Crossrail 2 which will allow enhancement of other services, such as those to/from Stansted Airport;
- release of capacity at Waterloo through the diversion of some South West suburban services onto Crossrail 2 which will allow enhancement of longer distance services, such as those to Woking, Guildford etc.;

- potential relief of crowding on the Central line if the future Eastern branch of Crossrail 2 is pursued:
- a significant improvement in accessibility for neighbouring Hackney and the Upper Lee Valley which will assist with regeneration and housing growth.

London Overground – TfL's proposal to extend the Gospel Oak-Barking Line to serve Barking Reach is supported as a means of opening up this area for much-needed housing development.

London Underground – It is essential that there is continued investment in upgrading the London Underground network. Passenger numbers are at an all-time high and look set to grow further, so it is very disappointing that some planned improvements, such as the re-signaling of the sub-surface lines, have been seriously delayed. The following are key priorities:

- Bank Station Capacity Upgrade - Transport & Works Act powers were granted in 2015 and implementation now needs to be expedited to deal with critical congestion problems at this key interchange.
- Sub-surface re-signaling – urgently needed to increase capacity on the Circle, District, Hammersmith & City and Metropolitan Lines.
- Extension of the Bakerloo Line to Hayes to improve accessibility of south-east London and release capacity on National Rail routes into London Bridge.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

The main opportunity to increase the benefits of Crossrail 2 is the proposed Eastern extension which will open up opportunities for regeneration in East London and help to relieve overcrowding on the Central Line and National Rail routes serving Liverpool Street.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

As has been seen with the Jubilee Line Extension and Crossrail, land and property values raise in expectation of future transport enhancements. There must be close coordination between the GLA, TfL, London Boroughs and other planning authorities outside of Greater London to ensure that planning policy is coordinated to maximise the benefits arising from infrastructure improvements.

To make sure that the benefits of future transport improvements are captured there needs to be an early comprehensive assessment of current land values, which should then be used to capture increases and recoup some of the uplift. The private sector should be expected to provide significant funding as businesses will directly benefit from such infrastructure improvements.

A key issue is to ensure that funding arrangements give the private sector certainty about their levels of contribution. In addition planning authorities need to develop policies (for example, in relation to social infrastructure and affordable housing contributions) which reflect changes in accessibility brought about by transport improvements.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

No comment

CECA Consultation Response

Civil Engineering Contractors
Association
1 Birdcage Walk
London
SW1H 9JJ

National Infrastructure Commission
1 Horse Guards Road
London
SW1A 2HQ

8 January 2016

Dear Sir/Madam

[National Infrastructure Commission call for evidence](#)

1. The Civil Engineering Contractors Association (CECA) welcomes the opportunity to respond to the above named consultation.
2. CECA provides the voice for those companies large and small who create, improve and maintain the UK's vital transport and utility networks. Our membership of more than 300 companies together delivers an estimated 70-80 per cent of all infrastructure construction work carried out nationwide. Our industry supports the employment of around 200,000 people with annual output of up to £25 billion.
3. We have long argued that the development of infrastructure in the UK has lacked long-term strategy. This has meant that large projects such as Crossrail and High Speed 1 have taken far too long to develop and build. Today, the delays we continue to see in solving the problems of airport capacity reflect this challenge.
4. Delays damage the construction industry's confidence in national infrastructure planning, resulting in lower investment in innovation and training within the industry.

The National Infrastructure Commission

5. CECA therefore welcomed the news in October 2015 that Chancellor George Osborne would establish an independent infrastructure Commission to help Government plan for the long-term. This is a policy change we discussed in our 2014 policy document, *The Infrastructure Decade*. It was also a recommendation of *Securing our Economy: the Case for Infrastructure*, CECA's joint report with the Centre for Economic and Business Research in 2013.
6. We anticipate that the new Commission will be given real authority to assess and make proposals for long-term major infrastructure projects alongside its development of innovative solutions to fund these infrastructure requirements.
7. In our view, the Commission should build on the existing National Infrastructure Plan to provide an overarching national infrastructure policy framework, linking to all Government departments and major stakeholders, helping to align strategies.
8. The new Commission must be empowered to become a truly independent expert body with a clear long-term role. This would give the construction industry, the business community and the wider public confidence in the direction of UK infrastructure for the long-term.
9. We recognise that the Commission has been established to advise on infrastructure, rather than to make decisions. It is appropriate that the final decision on matters related to strategically important infrastructure issues rests with those who have been given a democratic mandate to do so.
10. However, we also recognise that the credibility of the Commission, and its potential to build confidence in the long-term future of the UK's infrastructure planning, will be strongly linked to how the Government of the day responds to any advice that it provides.
11. As such, we would have concerns if the Commission's advice is not typically accepted and acted upon. Were this to be the case, there is a risk that the Commission would actually serve merely to perpetuate and amplify the political challenges that it has been established to help cut through.
12. **We anticipate that the Commission will prepare an annual report of its activities. We recommend that this report provides an item-by-item overview of the advice that has been provided to government, along with a RAG rating of whether that advice has been implemented in part or in full. This will allow stakeholders to have visibility of the Commission's views on whether its advice is being taken up.**

CECA response to the Call for Evidence

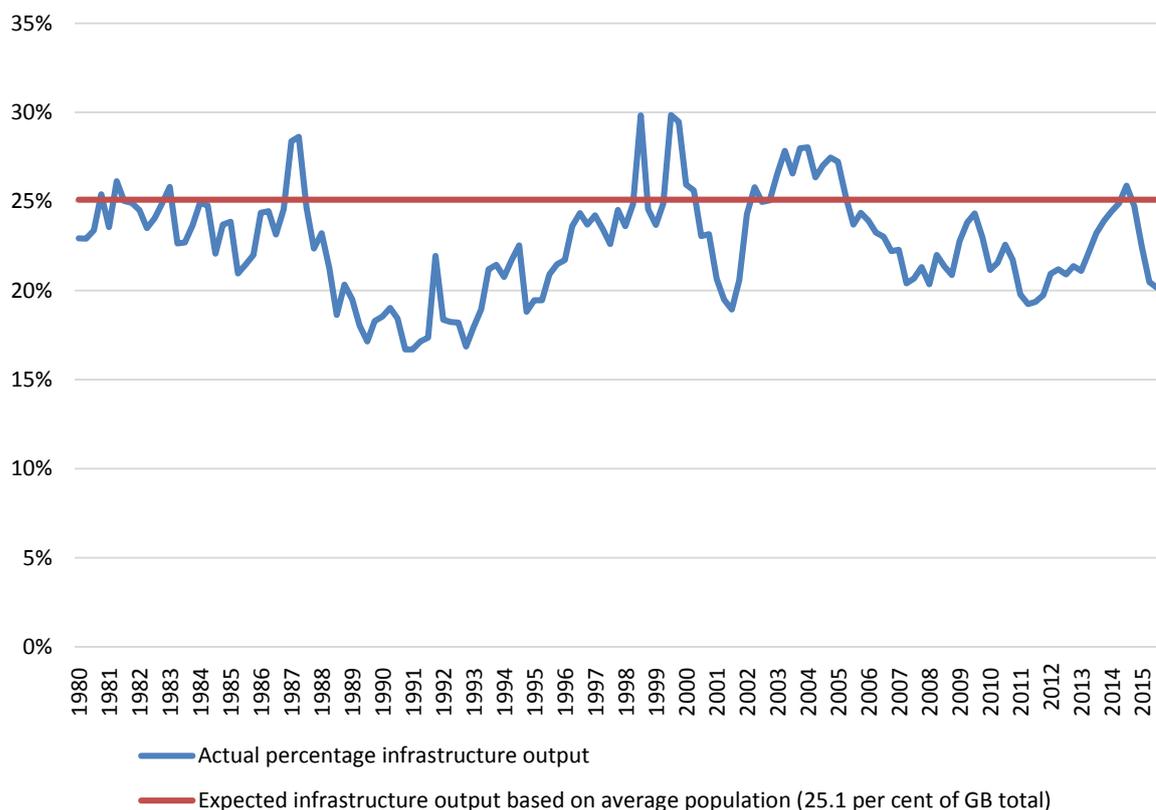
13. Much of the Call for Evidence focusses on issues related to strategic planning for infrastructure. While our members have an interest in these issues, we do not collect evidence that would be useful to support the Commission in these areas. As such, we have limited our initial response to those areas where we feel we can provide useful views from industry.

Improving connectivity between cities in the North of England

14. Our members have a dual interest in the issues of connectivity in the North of England. Members of our regional associations in North East, North West and Yorkshire & Humberside not only deliver an estimated 70 per cent of all transport infrastructure construction work in the North of England, but are also extensive users of the networks. As such, they have extensive experience of the challenges of connectivity between northern cities.

15. These companies recognise that the North of England has historically seen a lower level of investment in its infrastructure than elsewhere in the UK. The difference is particularly acute when comparing investment in northern England with that in the South East and London.

Northern infrastructure output as percentage of GB infrastructure output

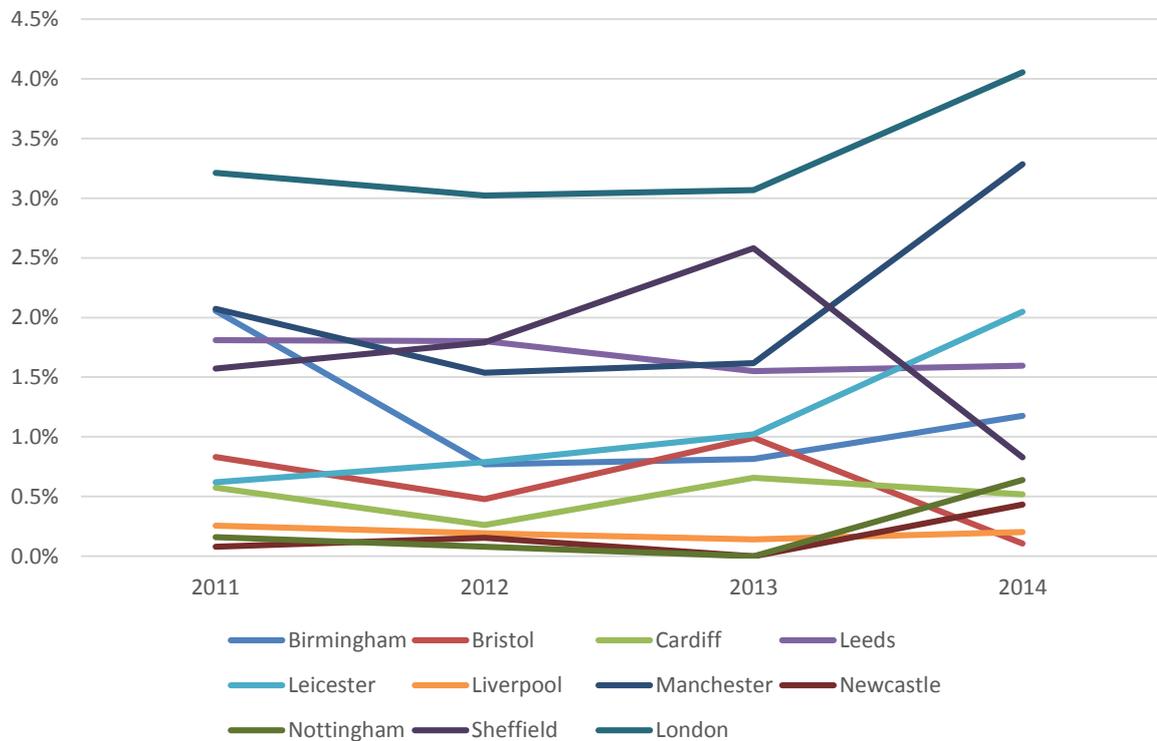


16. The graph on the previous page illustrates this issue. It shows that since the Office of National Statistics started collecting output figures for infrastructure in 1980, regional breakdown of the data shows that the North of England (North East, North West and Yorkshire & Humberside) has largely seen lower levels of output in infrastructure than would be expected based on its 25.1 per cent average share of the GB population.
17. There are many strong arguments why this may be the case. While many of the UK's largest cities are in the North, the most populous regions of the UK are the South East and London. This large and growing population creates additional pressure on infrastructure networks, necessitating investment to maintain network capacity and availability.
18. We see evidence of this in the levels of congestion on roads in London and the South East compared with the rest of the country. According to Department for Transport figures¹, 17 of the 20 local authority areas with the greatest delays due to congestion are in London and the South East.
19. Similarly, official figures² show that London experiences more overcrowding on its trains than any of the northern cities (although the most recent figures for Manchester suggest that it is starting to experience similar levels of congestion).

¹ Department for Transport - *Average journey times during the weekday morning peak on locally managed 'A' roads: by local authority in England, annual averages from 2006/07*

² Department for Transport - *Passengers in excess of capacity (PiXC) on a typical autumn weekday by city: annual from 2011*

Passengers in excess of capacity on a typical autumn weekday by city: annual from 2011



20. The economic geography of the UK also means that the business cases for investment in London and the South East are stronger, as assessments are built (in part) on the basis of economic impacts of investment on business users and private sector providers. The higher economic output of London and the South East therefore strengthens the economic case for investment as 'higher value' impacts will be achieved.
21. However, these factors create a self-sustaining vicious circle, with investment in housing and industry 'sticking' in London and the South East. This creates a more unstable economy in the region with rising population and increasingly costly infrastructure to mitigate the congestion this creates.
22. As we will discuss later in this paper, we do not believe that the response to this should be to transfer transport investment away from London. The factors that underpin London's rapidly rising population will take time to resolve, and it would be dangerous to remove the investment that ensures that the capital's transport networks can continue to function.
23. But we equally recognise that some of the pressure on London could be relieved if cities outside London, including those in northern England, offered the factors that currently attract people and investors to London. In doing so, they could draw people away from London, while stimulating more balanced economic growth across the country.
24. It is very clear that appropriate investment in transport is one of the most effective mechanisms to boost economic activity in a region. Our report *Securing our Economy: the Case for Infrastructure* found that for each £1 billion increase in infrastructure investment, UK-wide GDP increases by a total £1.299 billion. Furthermore, for every

£1 billion of infrastructure construction increases overall economic activity by £2.842 billion.

25. Importantly, investment in infrastructure boosts job creation. The same report found that for every 100 jobs created during the construction of infrastructure, a total of 305 jobs are created in the economy as a whole. There is also strong evidence of a link between infrastructure investment and the development of new housing.
26. **For the above reasons, we believe that the Commission may wish to consider whether future transport investment appraisal may put additional weight on the ‘rebalancing’ impacts that can be achieved through investment outside London. This should not be seen as a political fix to move investment towards the North (although it may drive a ‘fairer’ balance of investment across the country in the future). Instead, it is a way to give greater recognition to the rising costs to the wider UK of an overheating economy in London and the South East, while still expecting each project to demonstrate the value that it creates.**
27. We believe that part of the challenge for the northern cities in terms of their ability to present credible cases for transport investment arises as a result of a lack of coordination. Historically these cities have tended to compete for resources rather than collaborate effectively. As such, they have not had the ‘firepower’ to present a consistent vision for their needs, in a way that London has been able to.

28. For this reason, we have welcomed the development of Transport for the North (TfN). We believe that it has the potential to develop a credible vision for the future of transport in, and between, the major cities of northern England. If it functions effectively, it should be the best positioned body to analyse and determine what the most appropriate major transport interventions should be across the North of England, and build a credible case for how they should be delivered. But in order to do so, it is vital the TfN is provided with the appropriate level of resources to discharge this role.
29. To this end we would wish to see strong leadership and authority from the newly established TfN. Clarity must be given as soon as possible on the role of TfN and how it will interact with other regional transport bodies including Transport for Greater Manchester in this work.
30. Part of this work will necessitate TfN to consider how future investment will be funded. While we would anticipate that existing funding streams would continue or be replaced, this will not be sufficient to cover the full cost of delivering the TfN vision.
31. To ensure that resource constraints do not hold back delivery of this vision, we believe that TfN should build on the successful funding model for Crossrail. The large scale of Crossrail meant that it could dig deeper into who the beneficiaries were for the project, and therefore more closely tie the funding for the work to those who would see the greatest benefit. As a result, Crossrail's funding was drawn from a wide range of stakeholders including major companies (Heathrow, Berkeley Homes), wider industry (Business Rate Supplement), and the tax payer (DfT and GLA/TfL) with each paying a fair contribution based on the benefits they would realise from the project.
- 32. As such, we recommend that TfN be given the freedom to consider a programme-level 'northern transport deal' that would look at the full range of beneficiaries from the plans, developing a mechanism that seeks contributions based on all stakeholders making a fair contribution based on the benefits that they will see from the programme being delivered. This model will also have the additional benefit of confirming the support of the population of the North of England for TfN's plans.**
33. CECA members are increasingly concerned about the deterioration of local roads in northern England due to decreasing local maintenance spend. The majority of vehicle journeys begin on local roads, and it is vital that these too are well maintained to ensure efficient journeys across national networks. There is an ever increasing backlog of local maintenance work which we believe must trigger an urgent rethink of the way repairs are funded.
34. To ensure there is enough money for highways maintenance alongside other major infrastructure projects, we propose wider use of prudential borrowing, while consideration should also be given to private finance models and the targeted use of local authority reserves.
35. We also feel that there are lessons from the water sector's transition from CAPEX to TOTEX spend, with greater consideration of the best way to invest to achieve outcomes, rather than purely looking at capital solutions.

London's transport infrastructure

36. As noted in our response above, we see transport congestion as a fundamental and enduring challenge to the future of London. This is not only a problem of London's future but one of its present, with increasing challenges associated with the use of the capital's road and rail networks. Already some of London's stations are overcrowded to the point that they are not accessible at certain times during the day, while commuters are unable to board some trains into the city at peak times. The capital's roads congestion is not only the worst in the UK, but is also higher than any other city in Europe³.
37. For this reason, as noted above, we believe that there needs to be a twin approach to resolving these issues. The first priority must be to ensure that demand continues to be met. This will require sustained investment in all of London's transport networks. However we also see the need to develop a strategic approach to divert population growth away from the capital by presenting viable opportunities elsewhere in the UK.
38. **We recommend that the Commission seeks evidence of the factors that are underpinning London's continuing economic growth. This evidence should then be analysed to consider how these factors might be replicated elsewhere, while using appropriate demand management to ensure that London's future population growth is better matched to its ability to respond.**
39. When looking at the specific large scale transport improvements that are required in London, we believe that decisions on which options to take forward should be based on which will deliver the best outcomes for London and the UK as a whole.
40. On this basis, the case for the delivery of Crossrail 2 seems very strong. The route targets an alignment that will tackle some of the most pressing congestion hotspots on the existing rail network, while also opening up significant tracts of land in north east London for the development of the housing that will be required to meet London's growing population, even if efforts to divert some population growth away from the capital are successful.
41. While recognising that the project will require significant upfront development funding, we understand that Transport for London forecasts that delivery of the project will largely pay for itself through a similar funding model to Crossrail, with those in the capital who will benefit from the project being asked to contribute towards its cost.
42. Through the recent/current delivery of Crossrail, Thames Tideway Tunnel and Northern Line Extension, London has developed a sustained pipeline of major tunnelling projects with continuity of workload for the sector. We anticipate that this pipeline will extend into the near future with works to deliver HS2 and the Silvertown Crossing.
43. However, there is a risk that the expertise that has built up in the UK may be lost if Crossrail 2 does not proceed. This would have negative consequences for the UK's

³ Europe's most congested cities in 2014 (ranked by annual hours wasted):
<http://inrix.com/press/scorecard-report-united-kingdom/>

ability to sustain this trained workforce to efficiently deliver other future tunnelling projects.

44. We also believe that there are significant opportunities to increase the benefits and reduce the costs Crossrail 2. Experience from many previous large infrastructure projects shows that many of the opportunities for efficiency and additional benefit are constrained due to decisions made at the earliest stages of development. Choices around the route, access and broad construction methodology tend to be taken early in the project life cycle, yet these can have significant downstream impact.
45. The companies who are involved in the delivery of infrastructure will tend to have the best understanding of where these opportunities lie. However, the pressures of existing procurement regulation mean that project developers often find it difficult to engage suppliers early to seek advice, for fear of falling foul of rules intended to avoid later conflicts of interest.
46. We believe that the revised EU procurement regulations give greater clarity that such early engagement is acceptable, with appropriate safeguards.
47. **As such, we believe that Crossrail 2 should be used as an exemplar of what can be achieved by appropriate early involvement of the supply chain in the development phase. Our engagement with members indicate that such activity could reasonably be expected to deliver at least 20 per cent savings against typical costs for a more traditional approach.**
48. We believe that this engagement could be achieved through ‘ultra-early’ appointment of suppliers to work on the scheme right through from early development through to delivery. However, recognising that this may be perceived as closing out options for competition for the delivery phase, we also see options for appointing an independent panel of advisors, drawn from industry, who would provide buildability advice to Crossrail 2 Ltd. Such advisors could be appointed from a panel of volunteers that would be seconded from industry, selected for their specific expertise around a given issue, and paid on a consultancy basis via a standalone body to remove any issues around conflict of interest. This would allow Crossrail 2 Ltd to benefit from the insight that could release the cost savings outlined above, while avoiding any concerns that advice from individual supply chain companies could see those companies barred from bidding for future work.



**Community
Transport
Association**

Response to the

National Infrastructure Commission Call for Evidence

Closing Date: 08/01/2016

The Community Transport Association

The Community Transport Association

The Community Transport Association is the national body working with the providers of community transport helping them to remain relevant and responsive to key areas of public policy and make a big difference for people and families in the communities they work in. These are typically charities and voluntary groups rooted in their own local community.

The CTA is the UK's leading authority on the practice and performance of the UK's community transport sector and uses its research to gather insights and intelligence from local communities to inform the development of public policy.

We are for, and about, accessible and inclusive transport.

We work with people who all want the very best for their communities and see accessible and inclusive transport as part of the answer to the big questions about how we are all to live, learn, work, participate and belong.

We work for a better world where individuals are able to design their own ground-up transport solutions, placing accessibility and inclusivity centre-stage in a way that nobody else ever has.

Community transport

In all parts of the UK, on every day of the year - including Christmas Day – thousands of community transport staff and volunteers are helping people to stay independent, participate in their communities and to access vital services and employment.

Community transport is about providing flexible and accessible community-led solutions in response to unmet local transport needs, and often represents the only means of transport for many vulnerable and isolated people. Significant user groups are older people and disabled people.

Using everything from mopeds to minibuses, typical services include voluntary car schemes, community bus services, school transport, hospital transport, dial-a-ride, wheels to work and group hire services. Most services are demand-responsive, taking people from door to door, but a growing number are offering scheduled services along fixed routes where conventional bus services are not available, especially in rural areas.

As community transport works to a different business model to commercial passenger transport services - i.e. it is always run for a social purpose and community benefit, but never for a profit - it often a more reliable and resilient way of ensuring a broader range of transport needs can be met.

Whilst the journeys community transport delivers account for a small proportion of the total passenger journeys made every year by the public, their significance in improving the lives of the people who use these services is remarkable.

CTA's Response to the Consultation

The CTA welcomes the opportunity to contribute to the Infrastructure Commission consultation process.

Community transport in all its forms, has the potential to offer a more reliable and resilient way of addressing a growing number of transport needs and accessibility issues. The possibilities are immense. Services that are needs-led, community-run, not-for profit, highly collaborative with high levels of volunteer involvement are all getting a good hearing in the debates about building better and more sustainable transport which is accessible and inclusive. It makes sense that the Infrastructure Commission should also want to hear about and consider the contribution of this vital, but often low-profile, part of the transport network.

In responding to the Commission we have structured our response around the relevant questions in the consultation document. Where possible footnotes are provided that point to further evidence for consideration. This response refers to the heading "For future investment in the north's transport infrastructure." In addition we have also made some general comments in relation to section 3 on London's Transport Infrastructure which mirror some of our conclusions on the role of community transport in connecting northern cities.

Contact Details

Any queries regarding this response should be directed to:

James Coe
Executive Assistant

[\[email redacted\]](#)

Website: www.ctauk.org

Follow CTA on twitter @CTAUK1

To what extent are weaknesses in transport connectivity holding back northern city regions (specifically in terms of jobs, enterprise creation and growth, and housing)?

Weaknesses in transport connectivity

- 1 Different stakeholders will view 'weaknesses' through different lenses. At the Community Transport Association we believe transport systems are weaker when:
- 2 The needs of vulnerable and isolated people and communities have not been at the forefront when public services and infrastructure have been designed. This includes older people, disabled people, those with long-term conditions, those living in social isolation and those who cannot access employment, education or training.
- 3 The system focusses solely on private car use and mainstream public transport and does not recognise and include activity from the ground up - community-led transport solutions and the local sharing economy. Not owning a car should not be a barrier to achievement or aspiration.
- 4 The result of these weaknesses is poor integration across and within different modes of transport with a lack of connectivity which, amongst other things, does not reconcile unused capacity with unmet needs.
- 5 The CTA's vision is of a more integrated transport network built from the ground up. The CTA believes the UK Government deserves a good hearing on its ideas for devolving more decisions about local transport and we welcome the moves by transport authorities and public bodies across the north to embrace the opportunities this may present.
- 6 However, we also know that many organisations are finding it hard to listen when faced with the reality of cuts to local government funding. The impact on the number and reach of bus services as a result of reductions in public spending have been well documented by organisations such as the Campaign for Better Transport.
- 7 As good transport links have a demonstrably positive link with employment we are worried that poor bus infrastructure will prevent many communities, particularly those in rural areas, from both supporting, and benefiting from economic growth. It is usually poorer people who are the most dependent on bus travel. Therefore there is a real danger that social isolation could quickly be translated into economic isolation for people who live in northern rural communities. Furthermore, as job seekers are dependent on effective infrastructure we believe that transport connectivity is vital for encouraging economic growth within northern city regions.

Social and economic benefits of community transport

- 8 We believe the social and economic benefits of community transport means that community transport should be considered integral to the debate about on how connectivity can drive economic growth.
- 9 Many community transport operators support local businesses through enabling people to access retail and other services on the high street. New research published in January 2016 estimated that for every pound invested by Devon County Council on community transport; almost £9 is spent in the local economy; with community transport services users spending an estimated £2.2 million in Devon high streets each year.
- 10 Councillor Stuart Hughes, Devon County Council Cabinet Member for Highway Management, in welcoming these figures said “Community transport is extremely important in Devon in helping people to maintain their independence and continue living at home. It provides a lifeline to those who may otherwise be isolated and, as these figures show, it is also important in supporting the local economy. Community transport... helps people who find it hard to get around to access their local shops and other services. The benefits to our local market and coastal towns are clear, and the success of community transport is thanks to the dedicated staff and volunteers.”
- 11 Community transport operators provide direct employment and opportunities for volunteers, which can enhance their chances of entering employment and reducing social security costs. Volunteers within community transport also benefit from social interaction that they may not otherwise get and provide a net economic benefit to society when the value of their time and contribution is monetised.
- 12 Poor access to private and public transport is a common labour market barrier for many young people. Community transport operators help them through initiatives such as Wheels to Work. South Yorkshire Wheels to Work has helped more than 500 people over three years to get to work, training or college through lending them a scooter and safety equipment and providing them with training.
- 13 Another example of a bespoke local service that addresses labour market barriers was set up by Ilfracombe and District Community Transport from Job Centre Plus. Local employers in the hospitality sector were having difficulty recruiting due to the lack of public transport in the evening. The community transport operator set up a late night minibus service running seven nights a week, picking up from several premises in the local area in order to take employees back to their homes in Ilfracombe.
- 14 In addition to investment in community leading to economic growth and job creation it can also lead to savings being made to the public purse by reducing spend in other areas.

- 15 Community transport services are of significant importance in supporting personal independence and tackling isolation. By supporting people to access vital services and social networks they enable them to stay in their own home which reduces the likelihood that they will need more costly publicly-funded care.
- 16 Community transport offers a wide range of benefits to local authorities and other public bodies. They are often less costly than their commercial equivalents and offer alternative solutions when conventional and subsidised bus services are withdrawn or are not viable, especially in rural communities.
- 17 Community transport operators will also often create value for some public services that have not had to make a financial contribution to receive those benefits. An example is in health, where the CTA survey of operators in England in 2014 found that 74 per cent of operators were enabling people to access health services, but only 24 per cent received any funding from the health bodies benefiting from this.

Improving transport connectivity

18. In improving transport connectivity within city regions we believe a number of actions regarding infrastructure are necessary. The first is that we believe local people should be given a greater role in shaping local transport that works for them. It is our belief that local infrastructure can only be improved through giving local authorities the power to develop integrated transport systems that include community transport from the outset. We believe that more has to be done to encourage more collaboration between the private sector and community transport operators, as a lack of collaboration leads to poor connectivity, inefficiencies and underused capacity in the system. We would contend that even though many mainstream public transport services have improved their inclusivity and accessibility in a meaningful and measurable way attention still needs to be given to all parts of the door to door journey. If people cannot get from their front door to the accessible train station because the first part of their journey cannot be made then the high profile measures taken to improve accessibility in public transport will not have fulfilled their promise or potential.
19. Looking at connectivity between northern city regions we know that poor access to private and public transport is a common market barrier for many young people. It has to be a particular concern that local authority cuts may make it impossible to simultaneously build affordable housing, and support effective transport, further decreasing mobility for many people. Community transport operations have a positive economic impact on city regions¹, and we believe that for this benefit to be felt between city regions it is necessary to consider how transport is regulated between city regions. We believe that regulation

¹<http://www.ctauk.org/UserFiles/Documents/In%20Your%20Area/England/State%20of%20the%20Sector%20for%20inhouse%20print.pdf>

needs to be proportionate to better recognise providers who work across town and city borders.

20. Fundamentally, capital infrastructure investment needs to ensure passengers are able to traverse the transport network by a range of different transport modes. Key to achieving this is investment in an intergraded transport system that uses accessible and integrated information technologies. Furthermore, any capital investment in infrastructure needs a revenue commitment to underwrite it, as Local Authorities continue to reduce bus subsidies this is likely to necessitate the need for partnerships with external transport providers.

What cost-effective infrastructure investments in city-to-city connectivity could address these weaknesses? We are interested in all modes of transport.

21. In developing city-to-city connectivity we believe it is right that the commission looks at transport holistically, rather than individual services. It is our belief that it is necessary to significantly invest in public transport solutions that incorporate passenger preferences toward multi-modal, and integrated transport solutions. As transport consultants Frost and Sullivan point out this vision of increased public transport use is:

22. “realised by a convergence of four main mega trends that are being continually tracked by Frost & Sullivan research teams – urbanisation leading to an increasing population density and potential for new mobility business models, social preference changes, rapidly advancing technological developments revolutionising mobility, and smart governance to enable the legislative framework for social innovation in transport to flourish.”²

23. It is our belief that a cost-effective means of ensuring city-to-city connectivity is ensuring travel permits cover a broad geographical area, and a number of services. Clearly, if travel permits include trains, buses, and community transport operators people have a greater opportunity for a lower economic cost to travel between cities. As mentioned above investment in transport shows a generous economic reward to towns and cities and as such would be a cost-effective way to increase city-to-city connectivity.

24. The Chancellor has committed to building around 1,300 miles of additional road surfaces, as highlighted in our blog we believe that developing road infrastructure is important in increasing connections between cities³. It is a concern that the vast majority of transport infrastructure funding is being directed toward London, coupled with local authority cuts there is the possibility that northern cities will not see any improvement in city-to-city connectivity. In this light we believe that investment in better roads between northern cities is an obvious but important starting point. In addition to this we believe that there are benefits to providing financial encouragement for vehicles that carry multiple passengers to travel between cities.

² https://www.hitachi.eu/en/sib/whitepapers/downloads/whitepaper_002.pdf

³ <https://ctauk.wordpress.com/2015/11/30/autumn-statement-transport/>

25. Finally, it is important to consider digital infrastructure as integral to overall infrastructure investment. Personal devices are increasingly being used for planning journeys, buying tickets and providing users with flexible travel information. As these technologies advance it is necessary that digital infrastructure provides reliable, informative, and flexible travel information in order to optimise passenger travel experience.

What form of governance would most effectively deliver transformative infrastructure in the north, how should this be funded and by whom, including appropriate local contributions?

26. We want to use the new impetus for greater integration arising from the Buses Bill to lead to the community having a greater say over what their local transport is like and, where they can, design their own transport solutions with accessibility and inclusivity built into them from the beginning.

27. We believe that governance arrangements should be responsive to the needs of vulnerable and isolated people and communities have not been always been at the forefront when public services and infrastructure have been designed. This includes older people, disabled people, those with long-term conditions, those living in social isolation, those who cannot access employment, education or training. As community transport operators have unrivalled insights into the broad range of needs and issues affecting these groups they would provide an ideal source of intelligence to inform the governance process and should be involved in it in some way.

28. In ensuring this can be achieved we believe that there should be a statutory duty on those charged with developing infrastructure in the north to ensure that community needs are considered from the design stage onwards.

London's Transport Infrastructure

29. Much of the discourse about transforming how transport is run in the north of England has been described as giving those areas "London-style powers". This is a reference to the perceived benefits for the public and passengers of the considerable powers Transport for London (TfL) to shape the transport system in the city region. Indeed, David McNeill, Director of Public Affairs and Stakeholder Engagement at TfL, spoke at length at our recent Westminster Conference about how London's experience with devolution and how its status as an integrated transport authority has enabled it to provide high quality and accessible transport for Londoners.
30. That said, we know that many people remain vulnerable and isolated with Greater London. Difficulties making the first or very last part of an entire journey might prevent them from ever benefitting from large-scale transport infrastructure improvements. Even if they can access the mainstream transport network over-crowding on some modes of transport makes it a daunting experience for some groups in the community.
31. We also know, however, that there is a vibrant community transport network across the capital filling gaps in mainstream services and meeting unmet needs and we know its work is understood and valued by TfL. Many of the social and economic benefits of ensuring community transport is part of the conversation about transport infrastructure, which we described in relation to the north of England, would also apply in Greater London. Indeed community transport operators in London have led the way in developing a robust methodology for demonstrating the social value of their services which will be published in January 2016.
32. The CTA would therefore wish to see these organisations with their unique insights into the lives and transport needs of vulnerable and isolated people fully included in the debate about economic and social challenges facing London to ensure that transport is as accessible and inclusive as it can be.



Sir Merrick Cockell
Chair of the Crossrail 2 Growth Commission
Crossrail 2
PO Box 72284
London
SW1P 9PB

17 December 2015

Dear Sir Merrick,

CBI London welcomes the opportunity to respond to the Crossrail 2 Growth Commission's consultation.

Across the UK, the CBI speaks on behalf of 190,000 businesses of all sizes and sectors which together employ nearly 7 million people, about one third of the private sector-employed workforce. In London, infrastructure investment is a key business issue and a recent CBI/ CBRE survey found London's transport infrastructure as the top priority for firms ahead of the mayoral 2016 election¹. In addition 94% of businesses see the quality of infrastructure as a decisive factor when planning future investment². Ensuring Crossrail 2 is developed so that it supports businesses as well as passengers creating homes, jobs and prosperity is therefore key.

The strategic role of Crossrail 2

Do you agree with the analysis of national/ regional economic trends which are integral to Crossrail 2's business case?

As some employees move further out of the city, reliable commuter routes to bring them into work are key

As some employees are forced to move further out of the capital due to rising housing costs, getting people from London's outer regions and from the wider country into London quickly and affordably is key. Increasing house prices are negatively impacting firms' ability to recruit and retain staff and the CBI/ CBRE London Business Survey found 32% of businesses saying that they are unable to offer flexible part-time employment due to the time/cost of the commute into London for employees who cannot afford to live locally. Similarly almost a third of firms said that employees are moving away from the local area and therefore having to leave their jobs as housing costs are too high. Transport connections are vital for commuters and Crossrail 2 will play an important role in facilitating these journeys.

Crossrail 2 needs to be viewed as a 'national' project

Highlighting the regional and national benefits of Crossrail 2 and ensuring the project supports the whole of the UK whether through transport links, jobs or supply chains is vital in getting public buy in to the project.

Crossrail 2 should be seen as a national project, supporting both the regions and the capital. Whilst the line will service greater London, it will also free up space on our national rail lines, indirectly supporting towns

¹ CBI/ CBRE London Business Survey 2015

² CBI/ AECOM Infrastructure Survey 2015

and cities such as Cambridge, Southampton and Woking. Crossrail 2 will also play a vital role in providing seamless connections from the new High Speed Rail line. 70% of high speed rail journeys will either start or end in London and so new infrastructure to support the influx of passengers will be vital.

The development of the line should benefit the regions through job creation and supply chains something that Crossrail was successful at doing.

Do you support a key objective of Crossrail 2, which is to ‘accommodate housing growth and regeneration across London and surrounding regions’?

Last year CBI London’s consultation response to the 2050 Infrastructure Plan argued that it was essential that our housing needs are incorporated into our wider infrastructure plans, with one of the key objectives of the plan being to unlock housing growth via infrastructure investment. Businesses cite ‘silo working’ as a key frustration and so we therefore welcome this objective of Crossrail 2 and would be keen to work with the commission to understand how we can accommodate housing growth and regeneration across London and surrounding regions. Almost 60% of businesses said that enhancing the housing offer including quality and affordability was a top priority for them ahead of the mayoral elections. Ensuring this Crossrail 2 helps to develop our housing offering is therefore key.

The local opportunities offered by Crossrail 2

To what extent is additional supporting infrastructure required to capitalise on the growth that Crossrail 2 could unlock?

As well as developing the new Crossrail 2 line, Transport for London must continue with investment across the wider tube network. Crossrail 2 will be just one line a commuter may use as part of a wider journey. We must ensure that journeys’ are seamless with a high quality user experience felt across the whole network. There will be little point having a good quality, fast Crossrail 2 if the onward tube connections are prone to signal failure, over-crowding and delays. Constant upgrades and developments must be factored in as a priority.

Resilient digital infrastructure and technology is key in supporting the opportunities that Crossrail 2 could provide

Investment in our digital infrastructure and ensuring our digital connectivity is resilient will be crucial ahead of the development of Crossrail 2. The successful running of these new trains will rely significantly on digital signalling. Ensuring we invest in good quality digital technology will therefore be fundamental to how well the new line operates.

Successful delivery and potential barriers

What potential do you think Crossrail 2 has to strengthen the employment market in your area of interest? Are any external factors needed to maximise Crossrail 2’s beneficial impacts?

Working with local leaders will ensure the project complements local growth strategies

The CBI has previously highlighted how national infrastructure projects must be integrated with local regeneration plans – this should apply to Crossrail 2 also. In order to get maximum bang for the buck that will be spent on Crossrail 2 we need to ensure that the project (local stations) are aligned with local priorities so that the full benefits are realised. It is vital that when choosing the location of stations, local council leaders are fully involved in the decision making process and can ensure that the plans will complement and enhance

growth strategies for the area. This will ensure that housing, jobs and growth will go hand in hand with the new station locations.

Crossrail 2 has the potential to boost local skills

Crossrail 2 has a key educational role to play in the local areas that it will impact. A concerted effort is required from businesses, government and other stakeholders to foster a long term culture of skills development to maintain progress towards Construction 2025, the industrial strategy for the sector. Many firms tell us their concerns regarding a lack of a talent pipeline in the sector. Crossrail 2 can help to encourage the future work-force by engaging them throughout its development.

Using digital connectivity to boost user experience

As route plans are made for the new line, Crossrail 2 must also outline how they plan to utilise 'smart' technology to boost user experience and passenger satisfaction. Smart technology has the ability to join up transport journeys with other transport suppliers and will enable real time information for passengers to make informed journey decisions. Not only would this help to improve journey experience, but it could also help reduce congestion across the network.

What are the most significant barriers to achieving any additional development opportunities that might come forward as a result of Crossrail 2?

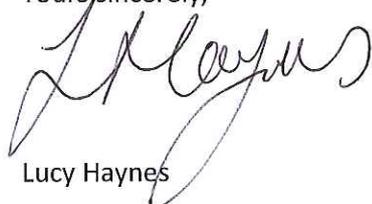
Joined up working is key to the development and success of this project. The Greater London Authority and Transport for London must engage early on with local stakeholders, businesses and local people to understand the additional development opportunities that might come forward as a result of the project.

A lack of investment in our digital connections will also negatively impact on the project. Ensuring we have quality and reliable digital signalling for the trains to operate effectively will be key.

CBI London would be delighted to discuss any of these points with the commission in greater detail.

Thank you for the opportunity to feed into the review,

Yours sincerely,



Lucy Haynes

CBI Director, London

Introduction

1. The County Councils Network (CCN) represents 37 English local councils that serve counties. CCN membership includes both upper tier and unitary councils who together serve over 25 million people across 86% of England. CCN develops policy, shares best practice and makes representations to government on behalf of this significant proportion of the country. CCN is a member-led organisation which works on all party basis and seeks to make representations which can be supported by all member councils. CCN welcomes the opportunity to respond to the consultation, and would also direct the National Infrastructure Commission (the Commission) to the responses submitted by our individual member authorities.
2. CCN councils account for 41% of England's GVA, a combined output of £527bn. Reflecting this county areas are also the nation's most significant contributors to the Treasury. County economies represent a very healthy mix of occupations – they have above average levels of skilled trades, managers and senior officials and private sector employment. Additionally the largest proportion of active enterprises in the country can be found in counties, the total number of which currently amounting to well over a million. To ensure that these opportunities are maximised we argue that the National Infrastructure Commission (the Commission) and government must work with county areas, alongside cities, to develop national infrastructure strategy and secure investment.
3. Within this submission CCN express our disappointment that the work of the Commission, leading into the 2016 Budget, will focus on London and big city regions. We set out a number of recommendations which would give a broader basis for the work of the Commission, to ensure that vital economic opportunities presented by county areas play a key role in national strategy.

The remit of the Commission – investing in counties and cities

4. Ensuring the right strategic infrastructure is in place will be key to the future economic health and competitiveness of the country. CCN therefore welcome the formation of the independent National Infrastructure Commission (the Commission) as a permanent statutory body. Government has an important role, working with local areas, to prioritise nationally important schemes, make capital available, encourage private and international investment and enable areas to raise investment in innovative ways.
5. The overarching role of the Commission is described as carrying out 'independent and unbiased assessments of the UK's long-term infrastructure needs ... to give clear strategic direction to industry and government and provide a firm basis for planning and investment.' The Chancellor has asked that the Commission undertake this role through five yearly National Infrastructure Assessments (NIA). In support of the first NIA the Chancellor has asked the Commission to propose some initial schemes for in-depth analysis in early 2016.
6. CCN welcome the introduction of NIAs, as they should ensure greater certainty for private investors, and provide greater assurance to local authorities and the development industry that

growth is deliverable in a sustainable manner, supported by existing and planned infrastructure. **We strongly suggest that the Commission thoroughly engage with the robust and evidence based priorities of counties in drawing up their NIA, and in making initial proposals for in-depth analysis in early 2016. CCN would be happy to facilitate and support such engagement.**

7. Additionally the Chancellor has written to Lord Adonis, Interim Chairman of the Commission, explaining that the Commission should concentrate its initial focus on three key areas; northern connectivity, London's transport infrastructure, and energy. As these are considered by central government to be the most pressing for the national economy, and these initial investigations will influence the 2016 budget. The Chancellor has issued the Commission detailed terms of reference for these first three projects.
8. CCN would like to express their disappointment that the work of the Commission has been so limited in the scope of its initial investigations, which will inform investment and priorities of the 2016 Budget. These initial inquiries focus entirely on London and the northern cities, without any regard to the rest of the country, except through references to 'commuter hinterland'.
9. We suggest that limiting the scope of these inquiries in such a way is not in the best interests of unbiased assessment of the UK's long-term infrastructure needs. We argue that strategic infrastructure investment is as pressing in county areas as it is city areas, that cities and counties function together, and that county regions represent substantial economic opportunities which must not be overlooked. These points are explained in further detail through this submission.
10. To address these points **we strongly recommend that the Commission takes a comprehensive, country-wide approach in making recommendations through its initial investigations, to inform the 2016 Budget. We urge the Commission to carefully consider the evidence put forward by CCN members to these initial inquiries, and broader evidence established through Strategic Economic Plans and other mediums to help inform this.**
11. **We also suggest that the Commission commit now to undertaking specific detailed inquiries into investment in county infrastructure as part of its next tranche of analysis and recommendations.**

Achieving our shared devolution goals

12. CCN share government's goals to devolve functions and financial freedoms, to bring decisions closer to the people and business they affect and to stimulate economic growth. To support this we must ensure that the Commission takes a localist approach and does not inadvertently centralise powers and decisions. Equally we must ensure that the work of the Commission and of government considers the economic opportunities in all areas and does not disenfranchise swathes of the country.
13. We note that government consider regional transport partnerships / Sub-National Transport Bodies to be an important stakeholder in the work of the Commission. We believe that in principle this is supportive of the devolution agenda. For example we are pleased to note that in its inquiry into infrastructure in the north the Commission will work closely with Transport for the North (TfN) to establish and evaluate options for investment.

14. We are also pleased that Sub-national Transport Bodies will involve joint decision making between the local elected representatives and businesses, the Department for Transport, Highways England and National Rail. These factors represent meaningful devolution and public service reform, which we hope will evolve over time.
15. To ensure that the best value is derived from these approaches **we strongly suggest that where counties wish to be a part of regional transport partnerships / Sub-national Transport Bodies they are encouraged to do so, and that government publically commits to promoting and listening to the important voice of counties alongside cities within these arrangements.**
16. In summer 2015 the Chancellor stated that TfN would be underpinned by 'devolving far reaching powers over transport to the North's Mayor-led city regions to deliver fully integrated public transport systems'. We must evolve this approach and ensure that the important economic and logistical hubs represented by counties are equally empowered, and able to contribute to regional growth. **We strongly suggest that transport and growth powers and budgets are devolved to counties where there are rigorous and appropriate governance measures in place and without a pre-requisite for metro mayors.**
17. In this context we are pleased that there has been a broadening of the membership of the TfN Partnership Board in recently months, beyond a city region focus to involve more county partners in the area. We would expect to see the role and voice of counties in such arrangements to growth over time, and would expect the Commission to fully consider the views of counties in its engagement with Sub-national Transport Bodies and individual areas.
18. **Where formal regional transport partnerships / Sub-national Transport Bodies are not in place, we still suggest that the Commission strive to engage groupings of local areas to help establish and appraise investment options put forward to government. CCN would be happy to facilitate such an approach.**

Counties role in sub-national transport and infrastructure governance

19. Counties are ready to take a lead role in driving sub-national transport and infrastructure, with local, national and international partners. Beyond the TfN example above counties have also been heavily involved with their city partners in the creation of Midlands Connect. This initiative has been promoted by Ministers and the Chancellor as a vital aspect of the 'Midlands Engine' for growth. We believe that Midlands Connect will play a key role in the infrastructure, transport and growth of the area, and would expect the Commission to engage with the board, in the same way they will engage with TfN.
20. Elsewhere in the country counties have come together to found England's Economic Heartland partnership. It is intended that this partnership will drive innovation in the area, as well as effective transport and infrastructure strategy. Forums such as this would be the logical point of contact for the Commission going forward, and help ensure that infrastructure opportunities from all parts of the country are considered.
21. In response to the national infrastructure, Sub-national Transport Body and devolution agendas more groupings of counties, counties and cities, or large county areas may begin to formalise sub-national transport arrangements. We must ensure that a one size fits all approach is avoided and that all areas have the chance to take on powers and influence national strategy.

The importance of county economies

22. To give a sense of scale, counties cover 86% of the landmass of England, they represent 47% of the country's population and are responsible for 70% of maintained roads. The combined population of counties now stands at 25.5m, and has grown 2.6% between 2010 and 2014, compared to 2.5% in metropolitan boroughs. It is estimated there are 10.6m households in CCN member councils, which is projected to rise 18% to 12.8m by 2037.
23. Using the latest data (2013) the economies of the areas served by the 37 CCN councils accounted for 41% of England's GVA, up 1% from the previous year, with a combined GVA of £527bn. This is strong performance compared to other areas of England. Further analysis of GVA growth since the recession shows that outside of London counties have seen the largest growth - 36% of GVA growth compared to 13% in the Core Cities. Equally county areas are the nation's most significant contributors to the Treasury. The latest breakdown of income tax receipts show that county populations contributed £66.4bn, which is 49% of all income tax in England and contributed 41% of all residential stamp duty.
24. County economies represent a very healthy mix of occupations – they have the highest levels of skilled trades in the country, above average levels of managers and senior officials and are only behind London for levels of technical jobs. Outside of London CCN members also have the highest levels of private sector jobs, and in counties the proportion of private to public sector jobs is steadily growing over time.
25. Additionally the largest proportion of active enterprises in the country can be found in counties, the total number of which currently amounting to well over a million. Outside of London counties hold by far the largest number of businesses created per 10,000 of population. There are countless FTSE 100 company headquarters based in county areas, to name a handful BAE Systems in Hampshire, National Grid in Warwickshire, Next in Leicestershire and Experian in Nottinghamshire.¹ Underlining this the Independent Commission for Non-metropolitan England stated 'Internationally mobile firms overwhelmingly choose non-metropolitan areas, not conurbations, as their base if they don't choose London'.
26. We argue that securing the national economy must take a broader view than simply connecting city regions together. Evidence is showing that county regions are growing faster than city regions and that the scale of business undertaken in counties is substantial. Equally evidence is showing that county areas are some of the most innovative² and that specialisation can be equally, if not more, successful outside of big city areas.³ We must ensure that infrastructure links cities and counties across sub-national areas and that business and commuting links for counties are built into infrastructure plans.
27. Rural areas, the majority of which can be found in counties, are set to become ever more important to the national economy according to DEFRA. A report of late 2014 found a net migration from urban to rural areas in England, stating 'whilst in many OECD countries there has been a trend towards greater urbanisation, the UK has been experiencing net migration from urban to rural areas'. This strengthening of the rural economy is associated with innovation, knowledge-based industries and a strong entrepreneurial make up. DEFRA conclude 'if harnessed, these trends could help drive significant growth in productivity, employment and output ... for the UK economy' and 'could offset aging demographics ... in such areas'.⁴

¹ The Independent Commission for Non-metropolitan England, Devolution to Non-metropolitan England : Seven steps to growth and prosperity, Final Report of the Non-metropolitan Commission, March 2015

² DEFRA, How increased connectivity is boosting economic prospects of rural areas, December 2014

³ Respublica, The Missing Multipliers: Devolution to Britain's Key Cities, September 2014

⁴ DEFRA, How increased connectivity is boosting economic prospects of rural areas, December 2014

28. Echoing these points the Independent Commission for Non-metropolitan England stated that 'non-metropolitan areas' high skills base positions them well for a world where trade is increasingly blurring the line between goods and services. They have an edge in knowledge intensive sectors, where getting people around the globe easily can be as important as moving goods ... Future transport investment decisions will be informed by local and global connectivity, including the role of regional airports in accessing global markets'.⁵
29. Many ports, freight routes, airports and logistical hubs sit within counties. These gateways to international markets must play a central role to infrastructure strategy and not just an afterthought as means of moving goods in and out of cities. Logistical hubs and routes present important economic opportunities in their vicinity, alongside their broader reach.
30. Alongside cities English counties have strong identities, commodities and brands which attract international attention. This is borne out by the number of FTSE 100 companies based in county areas, but has huge potential to continue to grow. Counties are iconic to British life and business; they represent the land and the mix of business and lifestyle opportunities which are attracting big business. They have the high value skills base and growing track record of innovation and specialisation to service start-up, growing and international business – we must ensure that physical and digital infrastructure keeps pace with this and helps the nation grow.

Capacity for improved productivity and growth

31. Despite counties' strong and vibrant economies delivering growth, employment and taxes for UK Plc, productivity remains a long-term weakness. Figures for counties show that their average productivity is 91, compared to the UK 100 Index. This is considerably below the London average of 122, and also the Core Cities average of 94.
32. A key factor in addressing this productivity gap is the right strategic infrastructure interventions. With this in mind central government and the Commission should work with county areas to secure investment in infrastructure priorities and devolve growth, infrastructure and transport powers. CCN have calculated that if counties were enabled to raise their productivity to the national average, this could contribute an additional £100bn to the UK economy.

The ability of local areas to invest in infrastructure

33. Alongside the devolution of transport, infrastructure and growth powers and budgets mentioned earlier in this submission CCN strongly suggest that national and sub-national growth will be maximised by equipping all areas with the fiscal tools they need to invest in infrastructure.
34. Greater London, and now Greater Manchester are able to raise a region wide CIL to fund strategic infrastructure projects. Equally the Chancellor has proposed that those areas with a metro mayor are able to increase Business Rates. CCN strongly argue that such powers must be extended beyond big cities, and must not be arbitrarily connected to the mayoral model of governance. **We strongly suggest that county areas are equipped with a full suite of fiscal freedoms, so that their businesses and residents are able to decide what measures are put in place to invest in strategic infrastructure projects.**

⁵ The Independent Commission for Non-metropolitan England, Devolution to Non-metropolitan England : Seven steps to growth and prosperity, Final Report of the Non-metropolitan Commission, March 2015



Rt. Hon. DAVID LAMMY MP

House of Commons
London SW1A 0AA

Member of Parliament for Tottenham

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8/1/16

To Whom It May Concern,

Please find below my submission to the National Infrastructure Commission's call for evidence in relation to London's Transport Infrastructure.

Yours sincerely,

Rt Hon David Lammy MP
Member of Parliament for Tottenham

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

London faces a wide range of economic and social challenges like any metropolitan city. But there are three specific areas where the challenges are so great that urgent action is required.

HOUSING: The housing crisis has been well documented, yet since 2010 no politician has implemented real solutions, either at national or mayoral level. Shortage of supply, driven by very low levels of house building, plus soaring demand, mean that the average property in my Tottenham constituency now costs more than £350,000, with prices up almost seven per cent in the past year. This not only means that far too many people will be denied the dream of home ownership; as prices and rents rise ever higher, it will also start to damage London's economy, as workers from all sectors and at all skill levels are priced out of the city's Labour market.

ECONOMIC DEVELOPMENT: We also need economic development and new jobs in relatively deprived areas such as Tottenham. The prosperity of the City still masks the acute problems for some people in my part of north London. Economic development here and elsewhere in London within commuting distance and north into the Stansted-Cambridge corridor is essential.

TRANSPORT: Clearly the pressures of population growth on the transport network are closely related to both housing and economic development. In Tottenham, pressure on the Victoria line and on rail services lengthens commutes for my constituents, causes delays and makes their journeys more crowded and stressful. Better transport systems would drive growth and jobs, as well as unlocking

significant new housing development and importantly would greatly improve the quality of life for many of my hard working constituents.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

I write this consultation in my role as Chair of the All Party Parliamentary Group on Crossrail 2. London needs full funding of its transport network – not the latest round of cuts imposed by the Chancellor. We need proper funding guarantees for Tube upgrades, including the Piccadilly Line, which some people in the western part of my constituency depend on. We also need network rail to upgrade the West Anglia Main Line to improve capacity, resilience and frequency across the area.

However, such transport projects alone will not be enough. Even though Crossrail will add around 10 per cent to the capacity of London's transport network when it opens from late 2018, we need a similarly transformative project to cope with the increase in demand a decade and more beyond that. Crossrail 2 is the obvious answer, and indeed the only scheme currently proposed which delivers a similar step-change in capacity. We need to get moving on making Crossrail 2 a reality.

Infrastructure should enable growth, and therefore projects should be assessed on their ability to payback the original investment. Static assumptions about how a place will function in future have been debunked by the Jubilee Line extension which transformed Canary Wharf. Our assessments should focus instead on a project's ability to create jobs, grow the economy and generate new tax receipts, allowing us to develop a more realistic view of the benefits of infrastructure investment. This would support investment not just in London but in other cities around the UK too.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

The benefits of Crossrail 2 could be maximised by the project working closely with the boroughs and with local communities to make sure that it helps deliver the kinds of increased numbers of homes – and jobs – that it is capable of. We need to strike a balance between preserving communities and allowing development which makes their futures viable in a London of 10 million people.

In addition, it is vital that while Crossrail 2 will inevitably cause disruption to communities while it is being constructed: we must listen carefully to the communities affected about the impact the disruption will have and respond to those concerns where possible.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

Delivery of Crossrail 2 and other large projects in London needs first of all to be as speedy as possible. We can't afford to delay the project any longer: we just need to get moving. The transport network is already under strain and even on the most optimistic projections, Crossrail 2 will not be in operation for another 15 years. Starting construction as soon as possible will mean lower prices, avoiding costly construction inflation.

That delivery can be ensured in the first instance by awarding the scheme substantial development funds in order to complete technical development and get planning consents through Parliament

before 2020. The majority of the wider funding package is already predicted to come from London, including contributions from the business rate supplement and Community Infrastructure Levy. I would like to see this augmented by fair devolution of business rates, as signalled by the Chancellor this autumn, and by radical new measures such as, for instance, the hypothecation of Stamp Duty in the capital, or a portion of it, for London to spend on such projects. Infrastructure projects such as Crossrail 2 have the potential to make a huge contribution both to the UK economy and to Treasury revenues, and funding of them should reflect that.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

I would like to see Transport for London take a more aggressive approach to using the profits of development to fund transport improvements, on the lines of that taken by Hong Kong metro operator MTR. Developers along Crossrail's route, for example, have already made a killing: we should be capturing much more of that to fund the transport projects transforming property values. But we also need to take a more long-term view of transport investments, as for example Paris does. There, the ambitious Nouveau Grand Paris project for extension of metro and suburban rail lines has funding for decades into the future, allowing much better planning – and value for money – of this kind of fundamental investment in the city's future.

National Infrastructure Commission call for evidence

Connecting Northern Cities and London's Transport Infrastructure

Submission from DB Schenker Rail (UK) Limited

January 2016

1. This is the response of DB Schenker Rail (UK) Limited (DB Schenker) to the call for evidence issued by the National Infrastructure Commission (NIC) in November 2015.
2. DB Schenker is the largest rail freight operator in the UK and is a wholly owned subsidiary of Deutsche Bahn, the second largest mobility and Logistics Company in the world. DB Schenker operates over 5000 trains per month in the UK conveying everything from cereals to coal, consumer products to biomass, petroleum to steel and is the leading rail provider to the construction industry in the UK. DB Schenker employs over 3300 people in the UK providing freight, infrastructure, rail support and charter passenger services within the UK and freight services to and from continental Europe via the Channel Tunnel.
3. DB Schenker, in common with other rail freight operators, is a wholly private sector activity receiving no material direct government support in the UK. In a heavily-capital intensive industry, DB Schenker owns and operates its own assets, including depots and rolling stock, and has invested heavily in new locomotives, wagons and facilities since UK privatisation.
4. DB Schenker's response is in four parts – general observations about the value and characteristics of rail freight, a description of the current demand forecasts for rail freight, observations on current government policy and rail freight's specific infrastructure needs and how these relate to two of the three national challenges set out by the NIC.

Rail Freight

5. Rail freight is a wholly private sector activity determined by customer and market needs. In this respect it is different to passenger rail and rail freight has a very different, less direct, relationship with Governments, funders and other devolved bodies as a result.
6. Rail freight generates over £1.5bn of economic benefits for UK plc every year through a combination of improved productivity, reduced congestion and wider environmental benefits. It is vital for the competitiveness of the UK economy and is an intrinsic part of everyday life in the UK.
7. Rail freight transports goods worth over £30bn pa, moving over 25% of the containers entering the UK and underpinning industrial sectors such as power

generation, construction and steel. Rail is a key supplier to UK manufacturing sectors such as the automotive industry and a major supplier to Network Rail and other Infrastructure Managers.

8. Rail freight has transformed itself since privatisation in the mid-1990s into a competitive and vibrant industry, recognised by the CEO of the Office of Rail & Road as “the most transformed sector in the rail industry since privatisation”. Total volumes increased by over 80% from 13.5bn ntkms in 1995 to 24.4bn ntkms in 2013-14.
9. The sector is changing as the UK economic base itself shifts, with reductions in traditional rail freight markets such as moving coal to power stations - where Government environment and other policy choices are driving conversion to biomass, renewables and other forms of electricity generation. Alongside this is an increase in the volume of containers moved for the growing retail/consumer sectors.

Continued rail freight growth will increasingly focus on the retail, construction and international sectors reflecting the general change in patterns of the UK economy.

10. This will have geographical as well as sectorial implications, as the concentration of the UK’s population south of a line from the Humber to Lancashire means that this will become increasingly significant for rail freight. Ensuring sufficient usable rail capacity is available south of this line to allow rail to compete with road will be more complex than ever over the next decade.
11. Rail freight is an intensely competitive industry – both within the mode and with road transport in particular. This strong competition has driven efficiencies, lowered prices to customers and reduced the costs of operation. The drive for longer and heavier freight trains is one example of how this has been achieved. In the decade after 2002/3 the number of freight trains on the network reduced by over 33%, whilst volumes increased by 17% - this meant (taking distance into account) that each freight train increased its cargo carried by over 50%.

These pressures will continue and the sectors offering the most volume potential for future rail growth are also those with the strongest price and service competition with road transport.

12. Intrinsic to maintaining rail freight growth and development will be continued private sector investment. Investment in rolling stock and facilities by freight operating companies such as DB Schenker is clearly understood - over £2bn has been invested by FOCs since privatisation.

In addition over £500m has been invested by Government (including EU funding) in Control Period 4 on freight specific network enhancements. In addition, a further £230m has been planned for Control Period 5 freight specific network enhancements by the UK Government and Transport Scotland.

Freight customers and suppliers - including ports and terminal operators have also invested heavily in rail freight facilities - over £250m in the last decade on port-related rail infrastructure alone. Investment in new rail-connected warehousing and terminals is critical for future rail freight growth.

Ensuring the private sector has the confidence to continue to invest to support rail freight - and rail freight growth in particular - should be a key consideration.

13. Rail can move freight in greater volumes, more safely and reliably than road transport. Each freight train removes up to 75 HGVs from the UK's roads – without rail freight over 7.5m additional road journeys would have been needed. Transporting freight by rail reduces CO2 emissions by 76% compared to road.
14. Rail freight operates in *response* to specific customer demand - a key distinction from passenger where services are planned in *anticipation* of demand. Many trains are customer-specific rather than multi-customer - so if a customer does not require a service on a particular day or week it will neither be scheduled nor operated. Rail freight's use of capacity is therefore often very different to that of passenger operators.
15. Both railway and political devolution pose challenges for national activities such as rail freight – for example in how an appropriate balance will be made between local/regional and national requirements/priorities in ways that best support both regional and national economic activity and growth.

Freight Market Study and demand forecasts

16. In October 2013 Network Rail published a Freight Market Study (FMS) as part of its Long Term Planning Process that (inter alia) contained growth forecasts for 2023 and 2043. These suggested that further rail freight growth of 2.9% until 2043 was possible. Government accepted that these forecasts were robust and should be adopted for planning purposes.
17. Crucially these were an *unconstrained* set of forecasts - i.e. current or anticipated future constraints were not taken into account.
18. In reality the railway is already constrained in many locations –e.g. the Midland Main Line which Network Rail has formally declared as “Congested Infrastructure” and for which there is increased current and forward demand for rail freight services. There are also well-known bottlenecks and capacity pinch points (such as the Felixstowe branch) that are inhibiting freight growth and development today.
19. The FMS forecasts were based on a series of key assumptions - two notable examples being the price of oil and its impact on road haulage costs/economics & the ability of the UK Planning system to enable necessary Strategic Rail Freight Interchanges (SRFIs).
20. The output of the FMS was consistent with previous studies in suggesting future growth will be concentrated in a relatively few key economic sectors - including Intermodal (the movement of goods in containers for both industry and the retail sector), Automotive, Construction (aggregates, other building materials and spoil/waste) and International (via the Channel Tunnel).

21. The FMS forecasts reflect the changing nature of the UK economy as it continues to develop and move away from traditional “heavy” industrial sectors such as coal and steel to a more service orientated composition which relates more closely to where people live and work.
22. Historic rail freight infrastructure provision reflected the role rail freight played between the 1960s and the 1990s; this has meant that the growth in intermodal traffic has driven the need for enhancement of rail infrastructure in other geographic areas, often in parallel with growth in passenger traffic.
23. The forecasts also highlight the critical and growing role of ports in the rail logistics chain; suitable and sufficient infrastructure connectivity to/from ports is critical for rail freight to be able to support the role the UK economy plays in global economic activity.
24. Appropriate connectivity between key UK ports and the main centres of UK population and economic activity is now a key imperative for future rail freight growth and the associated current (and additional) benefits for the UK economy.

This is where Government’s role - in terms of both policy support and funding - is key.

25. Alongside this, it will be necessary for continued investment in rolling stock and SFRIs (which will need to encompass both rail connected terminals + rail connected warehousing). The private sector will be willing to continue to invest in such facilities (both Freight Operating Companies such as DB Schenker and third parties) if both the investment climate and levels of political/regulatory risk are acceptable.

Government Policy and Rail Freight Infrastructure needs

26. The 2007 Rail White Paper defined the Strategic Railfreight Network (SFN) as “a core network of trunk freight routes, capable of handling more and longer freight trains, with a selective ability to handle wagons with higher axle loads and greater loading gauge, integrated with and complementing the UK’s existing mixed traffic network”.
27. The subsequent 2007 publication “Strategic Rail Freight Network - the Longer Term Vision” - was the then Labour Government’s expression of a long term rail freight policy. This policy was subsequently explicitly continued by the Coalition Government who (together with associated EU funding) invested over £0.5bn in rail freight infrastructure enhancements in Control Period 4.

The present Government is currently reviewing and reforming its rail freight policy.

28. Since 2007, UK rail infrastructure planning has adopted the central themes of the SFN;
 - a. Longer and heavier trains – with the standard length for intermodal trains becoming 775m;

- b. Efficient operating characteristics;
 - c. 24/7 capability;
 - d. W10/W12 gauge capability (including W9 gauge if Channel Tunnel traffic is involved);
 - e. New freight capacity where required;
 - f. 25kv AC electrification of freight routes (which provides opportunities for gauge enhancement as well as electric haulage).
 - g. The development of SFRIs, supported by the National Networks and Ports National Policy Statements;
 - h. Strategic Freight Capacity to protect necessary train paths.
29. These features remain relevant and usually form the starting point of rail freight infrastructure planning. This should continue to be the case, but the themes need regular review to avoid ossification.
30. European railways are already researching the feasibility of freight train lengths of 1500m on selected European mixed-traffic routes, and it is well known that North American practice remains to operate freight trains that are significantly longer than 775m.

Connecting Northern Cities

31. Northern cities are already important destinations/origin points for intermodal and other traffics to/from ports and the Channel Tunnel, with established services to & from key ports such as Southampton, Felixstowe and London Gateway (the three ports that currently dominate UK links to many global supply chains).
- Much of the Control Period 4 and 5 rail freight expenditure / plans have been targeted at improving gauge capability and limited capacity additions on routes to/from these ports. Some of the CP5 plans – for example gauge enhancement between Syston Junction (near Leicester) and Stoke-on-Trent - are currently being re-phased following the Hendy Review.
32. Planning freight trains into some existing terminals (e.g. at Trafford Park in Manchester) is already complex because of the sheer number of other trains at locations such as Manchester Piccadilly.
33. In addition, movements of bulk products such as aggregates and building materials also feature into cities such as Manchester and Leeds, although not to the extent currently seen in London and the South East.
34. The Humber ports – and especially Immingham – are the UK's largest rail freight forwarding locations with very substantial volumes especially of bulk products such as petroleum, coal, biomass and steel.

35. The port of Liverpool, with established rail traffics such as coal, steel and biomass, is investing in a new £300m deep-water container terminal that will double the port's container handling capability and a trial rail intermodal service to the West Midlands has recently been operated.

If the port's aspirations for growth are achieved, it is likely that there will be significant increases in rail freight volumes and these are likely to impact across the north of England and pose significant challenges for the rail sector.

36. Northern cities, particularly in the NW, are central to the FMS growth plans, whether from local ports or more distant ports or regions of the UK. Crucially capacity to accommodate this potential growth is limited/constrained on *all* the key routes.
37. Cross-Pennine transits have become especially challenging. It is not possible to obtain economically viable freight paths during the day on the main Manchester – Leeds route via Huddersfield (known colloquially as the “Diggle” route) and it is increasingly difficult to obtain freight paths on the Calder Valley route via Hebden Bridge.

The main “freight” cross-Pennine route has therefore become the more southerly Hope Valley line between Stockport and Sheffield. This is better located for (e.g.) aggregates movements from the Peak District rather than for intermodal or biomass movements. However access to, and capacity on, this route is not without its own challenges.

38. Studies into options for future cross-Pennine rail options therefore need to ensure that rail freight's needs are taken fully into consideration and that current routing assumptions should not be presumed to be ideal or even acceptable.
39. The West Coast Main Line (WCML) is the UK's principal freight artery, critical for intermodal and international movements and central to the realization of the FMS growth projections. Key elements in achieving this will include;
- a. Securing for rail freight an appropriate share of the capacity on the WCML that will be released after the construction of High Speed Two;
 - b. Ensuring that the introduction of classic-compatible HS2 trains onto the WCML north of the HS2 dedicated infrastructure does not result in a timetable that “squeezes” existing rail freight services or projected rail freight growth;
 - c. Ensuring sufficient connections for rail freight exist between the WCML and existing / proposed SFRIs in the North West.
40. Increased use of rail freight into and through Northern Cities would seem to offer potential additional benefits for customers/users if sufficient capacity could be developed. There would also be wider societal/environmental benefits in terms of a reduction in carbon and other emissions and improvements in air quality.

London's Transport Infrastructure

41. London's current rail freight activity falls into two distinct categories;
 - a. Trains that support the economic activity of London and the surrounding region.
 - b. Transit freight that passes through London because of its hub position in the UK rail network.
42. Very substantial volumes of construction materials are moved into London and the surrounding region and underpin much building and development activity. Trains come from Yorkshire, the Mendip Hills, the Peak District and Leicestershire as well as closer locations on a very frequent basis, conveying aggregates, cement and other building materials.

These are delivered to a network of relatively small single-user rail terminals where the product is unloaded, stored and then distributed by road to building sites. Physical space limitations at these receiving rail terminals mean that frequent rail deliveries are necessary and the operations often have characteristics similar to "just-in-time" deliveries. Many of these terminals also have operating limits imposed as part of planning consents which in turn impedes the relationship with the rail network.

43. In the opposite direction, rail can be an effective solution for the removal of spoil or waste from larger development sites, especially if the material is contaminated or requires special handling. For many years rail has moved containerized domestic waste from London for landfill.
44. Rail freight also provides substantial support for the Automotive industry in the London area, in moving automotive components and on occasion finished vehicles.
45. A notable exception to the commodities handled by rail in London is Intermodal or containerized goods. In part this reflects the proximity of London to the main Deep Sea ports, as well as the Channel Tunnel and short sea ports such as Tilbury and Purfleet. However the lack of any substantial SFRIs or terminals in the London area means that potential domestic intermodal traffics cannot be realized.

Strenuous attempts have been made over the past decade to develop new intermodal rail handling facilities in the London and South East. In particular, potential developments at Radlett and Colnbrook have spent years attempting to navigate the Planning System and being resisted by local authorities and residents at every stage.

46. A network of SFRIs, around London (perhaps in relation to the motorway or trunk road network) are a key requirement for the nation as well as the city/region to realise the economic and other benefits of modal shift to rail.
47. London's proximity to key ports such as London Gateway, Felixstowe, Tilbury and Purfleet also explains much of the transit freight that is routed via the capital. The broadly "hub and spoke" nature of the UK rail network means that there are few

routes between the arterial “main lines” outside of London.

Until relatively recently, some cross-London railways such as the West London Line & Gospel Oak – Barking Line were predominantly freight; however growth in demand for passenger rail services has led to dramatic increases in passenger use of these and other lines such as the North London Line, and increasing pressures between passenger and freight use. These routes are moving toward a very frequent ‘turn up and go’ passenger service which reduces capacity for rail freight services dramatically.

48. In addition, all rail freight services from the Channel Tunnel (whether traveling via High Speed One or Network Rail infrastructure) are routed via London.
49. Almost without exception, there are no alternatives to the current transit freight train routing through London. Development of the route north of Ipswich to Peterborough is aimed at accommodating *some* of the projected freight growth from Felixstowe – but none of the existing traffic.
50. Looking ahead, the volumes of rail freight in and around London will continue to increase.
 - a. The role of rail in moving construction materials will continue – DB Schenker, together with the construction industry, are developing new, larger & more efficient multi-user aggregates facilities at Bow, Cricklewood and Willesden. These will be capable of handling larger trains more quickly and will help to create the capacity required to support infrastructure growth in London. They will increase the product carried per train path into the capital and will provide modal shift potential. It is not clear if the development of these sites will create land capacity elsewhere for development or whether these will be in addition to existing facilities rather as replacements.

Without this movement of construction materials, planned developments and increases in housing supply are also likely to be impeded or frustrated.

- b. Rail will continue to support major infrastructure schemes – for example in the building of High Speed Two and associated developments such as the redevelopment of Euston Station or the Old Oak Common area.

This contribution can be maximized with early engagement within the Pre-Planning / Consultation process so that rail freight can deliver enhanced economic and environmental benefits to projects as proven by in the cases of Heathrow Terminal 5, London 2012 Olympics and Crossrail.

- c. DB Schenker is also investing in a new Railhub for automotive handling adjacent to the junction between Network Rail infrastructure and High Speed One at Barking. This facility will be able to exploit the movement of finished vehicles to and from the UK via High Speed One with its larger loading gauge which will increase the rail options available for use.

This facility will benefit Automotive manufacturers in the London area, but

also others across the UK and has the potential to become a vital node in imports and exports for a key UK manufacturing sector.

- d. When one or more SFRIs are finally opened, the potential for intermodal movements between London & the South East and the North West/Scotland will be significantly enhanced. Such movements are a key part of the forecast growth of the Network Rail FMS.
 - e. In addition, there is potential for rail involvement in “City Logistics” with rail movement of consolidated deliveries for retail outlets to terminal stations or other hubs, and then transshipment to (e.g.) electric or other vehicles for sustainable “last mile” delivery.
 - f. The continued development of London Gateway will also result in increased rail services, most (if not all) of which will be routed via London.
51. Increased rail freight services also offer the potential to reduce carbon and other emissions, improving air quality and supporting improved quality of life.
52. Together with the forecast increases in demand for passenger services, it is evident that much of London’s key rail infrastructure will remain mixed traffic in nature and operating at or near capacity, with potential implications for performance.

Increasing rail capacity in London via physical enhancement is expensive and disruptive; the deployment of ERTMS/ ETCS might offer some relief, but this is uncertain and some years away.

As a minimum, improved planning and co-ordination (within what is possible in competitive markets and customer requirements) would seem advisable.

53. On its own, it is unlikely that any rail freight developments will justify the level of capital expenditure in major infrastructure enhancement – but the benefits of rail freight may well make a substantial contribution to the benefits calculation of any wider business case and it is important that these are always carefully articulated and factored in.
54. Network Rail and other railway organizational forms typically follow the arterial route structure into London and hence cross-London movements such as rail freight will cross two, three or four railway organizational boundaries. It is important that any potentially negative effects of this are avoided as Network Rail devolves more power to its routes; this will be a key task for the System Operator function of the future.

The Benefits of Transport Investment: and why we can't build our way out of congestion

Submission to the National Infrastructure Commission by Dr David Metz, Honorary Professor, Centre for Transport Studies, University College London, formerly Chief Scientist, Department for Transport.

In this submission I offer evidence of the ways in which transport investment benefits individuals and society, in particular how this contributes to economic growth. I compare and contrast the rather different situations of London and the Northern cities.

Long term trends in travel behaviour

The Department for Transport (DfT) commissioned the first National Travel Survey fifty years ago and has repeated this regularly for forty years. Figure 1 shows the key parameters on a per capita basis covering all modes of travel (except international air). Average journey frequency has remained at about 1000 trips per person per year over the period. Average travel time has held steady at around 370 hours a year or an hour a day, a figure found globally for settled populations. What has changed is the average distance travelled, which increased from 4500 miles a year in the early 1970s to 7000 miles by the mid-1990s, since when there has been no further growth.

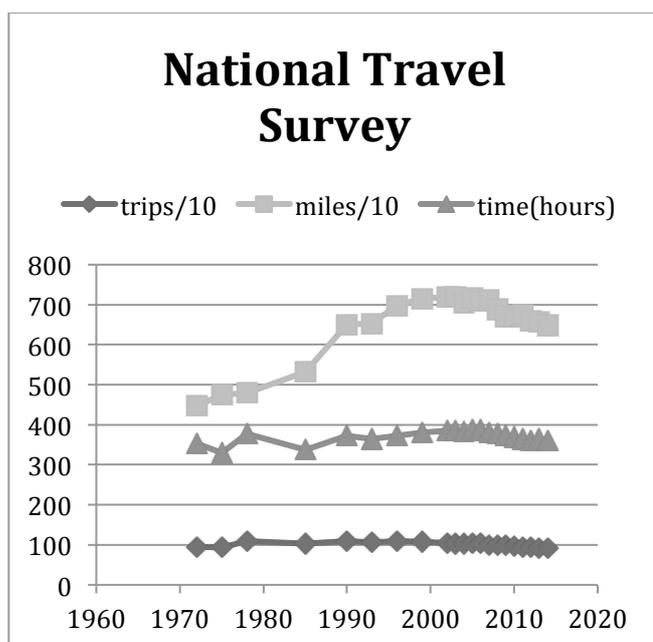


Figure 1 Source NTS(2015)

People have travelled further in the same amount of time because they have travelled faster, the consequence of investment in speedier forms of transport – private investment in cars, public investment in road and rail infrastructure and trains. It is important to recognise that people have taken advantage of higher speeds to reach more distant destinations, not to save time travelling to unchanged destinations. We travel further in order to have more access, opportunities and choices. For instance, by travelling faster on the journey to work, we have more choice of employment accessible from where we live in the time we allow ourselves for commuting, more choice of homes accessible from our workplace, and similarly more choice of shops, schools etc.

Figure 1 shows that there has been no growth in per capita travel for the past twenty years. Growing personal incomes are no longer an important factor in the growth of travel. Rather, population growth is now the main driver of overall demand growth.

Three-quarters of the average distance travelled in Britain is by car, hence we find that the average distance travelled by car has also ceased to grow, starting well before the recent recession. This cessation of growth of per capita car use is found for most of the developed economies for which data is available, a phenomenon known as ‘peak car’. A number of contributing factors have been identified, including less interest in cars by the urban young, changes in company car taxation (in the UK), saturation of demand for access to daily travel destinations, and technological constraints on faster travel (Metz, 2013).

Economic benefits of transport investment

The convention of transport economists, central to the DfT’s investment appraisal methodology, is that the main economic benefit of transport investment can be estimated as time saved through faster travel. Such time savings are valued because they permit more productive work or desired leisure. However, the evidence of the National Travel Survey is that there are no time savings in the long run, as seen in Figure 1, which is in effect an evaluation of the impact of cumulative investment over a forty year period. Time savings are therefore short run and mislead as regards the benefits of investment in long lived infrastructure.

People take advantage of higher speeds to travel farther, which results in changes in land use, development in particular. This is evident in the regeneration of East London, Docklands and beyond, the consequence of public investment in urban rail that has made brownfield land accessible for development by private sector developers who construct commercial and residential properties that accommodate jobs and homes for the city’s growing economy and population. The causal mechanism linking transport investment to economic benefit is via improved access and resulting development.

Notional time savings by those who, for instance, will travel from home to Canary Wharf using Crossrail when opened do not illuminate the case for this investment since these depend on both uncertain forecasts of passenger

numbers and problematic Stated Preference experiments intended to value individuals' trade-offs between time and money. Moreover, the 'wider impact' benefits that are conventionally added to the time savings are based on econometric estimation of agglomeration and related effects – further notional benefits, not directly observable.

Changes in land use and enhancement of land values are not included as benefits in conventional appraisal because this is seen as double counting benefits already included as time savings. However, this is a theory-based approach. An evidence-based approach would count what is real and observable, which would avoid double counting because people can do only one thing at a time – if they are taking the benefit of faster travel to gain more access, opportunities and choices, they cannot be saving time to carry out other activities, and vice-versa.

Investment appraisal of proposed transport investments should accordingly be based on evidence of expected benefits, as assessed from evaluations of outcomes of similar completed schemes. In general, changed land use and real estate development will constitute an important part of the benefits, which it would be misleading to disregard.

Road and rail investment

The case of investment to catalyse the development of Docklands is characteristic of new rail routes. Recall the USA in 1840, populated largely along the coasts and inland waterways, the economy about the size of that of Italy's. There followed a boom in railway construction that opened up the interior to agriculture, mining and industry such that by 1890 this was the largest economy on the world.

Rail investment can effect a step change in access. For roads, the effect is generally incremental. Consider England's Strategic Road Network (SRN) where much investment is planned to cope with forecast growth of traffic. Congestion largely occurs near to populated areas where local users take advantage of the network for daily travel, whereas remote from such areas the traffic generally flows freely. Thus about half the traffic on the M25 comprises long distance users, for instance between the south coast ports and the Midlands and the North, avoiding London, the purpose for which this orbital route was built. The other half is local traffic, in particular journeys to and from work giving rise to the familiar morning and evening peak congestion.

The conventional approach to investment appraisal sees a congested motorway as an opportunity for investment to increase capacity. Time savings per vehicle multiplied by the large number of vehicles, then multiplied by standard values of time savings, generate monetary values of economic benefits that are compared with the construction costs to allow judgment about value for money. However, the time savings per vehicle are quite small.

Evaluation by the Highways Agency of a large number of what it terms 'major schemes' indicates average time savings of 3 minutes at peak, less away from the

peak usage. There is debate about the significance of such small times savings. On the one hand, it is argued that these are too small to change behaviour and so should be disregarded. On the other, it is contended that small time savings add up and so in logic must be counted.

While 3 minutes saving on a long distance trip is immaterial in behavioural terms, such time saving is likely to be significant for a local user. The faster travel made possible by an extra lane or improved junction, for instance, allows more opportunities and choices, particularly when people come to change jobs or move house. More generally, in those parts of the country where demand for housing exceeds supply, it must be expected that local users will take advantage of additional capacity on the SRN to seek more distant housing opportunities that they can afford. A similar effect is seen with urban rail improvements such as London's Overground. Some of the largest percentage increases in house prices in London in recent years have been found near stations on this route south of Docklands, in locations like New Cross, of limited inherent attraction but with relatively low priced housing.

When analysing the case for road investment, it is important to consider the different kinds of user and how each may benefit (as is done for rail investment, where commuters are distinguished from long distance travellers). Available evidence is consistent with the proposition that the main benefits of investment in the SRN accrue to local users who are enabled to travel further on their daily trips. The extra traffic thereby generated is known as 'induced traffic', which is the consequence of road construction and arises because in the long run people take the benefit of faster travel by travelling further, not by saving time. This extra traffic restores congestion to what it was before the investment and is the basis for the maxim 'You can't build your way out of congestion', which we know from experience to be generally true.

The increased access made available to local users leads to changes in land use - property development where planning consent is granted, increased prices of existing property where not. Such development is largely unintended. There is, however, a case for intentional road construction to foster development, but this has to be led by the developers and planners. If they agree that a site is suitable and commercially attractive for development, whether residential or commercial, and if investment in road access is needed to permit the development, that could be an appropriate claim on a roads budget, whether local or national, subject to a value for money test.

An example is the plan for a new 'garden city' on a former military site near Bicester, where 13,000 new homes are to be built and where the DfT has allocated £44m for road construction, including a link to the M40. This illustrates both that new housing on greenfield sites will require road investment on account of car ownership by residents, and that decisions about the location of such investment must be based on the intentions of the planners and developers, bottom up, not as part of a top down national strategy.

Tackling congestion

The rationale for much roads investment is to relieve congestion. One stated aim of the Government's Road Investment Strategy is a 'free-flow core network, with mile a minute speeds increasingly typical'. But if we can't build our way out of congestion through investment in civil engineering technologies, how is this aim to be achieved?

One possibility would be to toll new road capacity, partly to finance the construction and partly to deter local users who impede long distance traffic. The M6 Toll road operates successfully in this way.

A second approach addresses the reason why congestion is a problem. Surveys of road users indicate that an important factor is lack of reliability - the uncertainty of journey time. This can be tackled by providing users with good predictive trip time information. An example is the motorway roadside variable message sign predicting the time to the next junction – albeit short range and hence of limited utility. A more ambitious service is provided for freeway users in the Seattle area of the US who can input to the Department of Transportation website the locations of their home and work, the time they wish to arrive at work, and are advised the time to leave home to be at work on time 19 times out of 20. A further example is Google Now, which includes predictive travel times on the road system.

As well as providing useful information to individuals that lessen unreliability associated with congestion, there are benefits to the network as a whole. There are two kinds of road user: those who need to be at their destination at a particular time (for instance, going to work, to a meeting, making time-critical deliveries), who can use predictive journey time information to decide when to set out; and those who are more flexible in trip timing (going shopping, making am/pm deliveries), who can use such information to avoid peak traffic. This is win-win since the more the flexible users can avoid peak times, the less the congestion experienced by those who cannot avoid them.

The scope for mitigating the uncertainty associated with congestion is indicated by the ability of efficient road freight hauliers to offer clients just-in-time delivery. A haulier may contract with a supermarket chain to deliver from the central warehouse to the stores within 30-minute time slots, which the haulier can achieve because of the good understanding of the network and the ability to manage the location and performance each vehicle in the fleet using real-time and predictive traffic data from commercial sources.

Transport and economic performance

This road freight example is one instance of the way in which investment, in digital technology in this case, can contribute to improving business performance. It should be seen in the broader context of retail distribution taking advantage of faster travel on the road network to optimise efficiency by

consolidating many regional depots into a few large central facilities, thereby saving estate and inventory costs while improving distribution to high street outlets, so enhancing competitiveness.

It is, however, difficult to generalise about how transport investment may be expected to improve economic performance where the road and rail networks are mature, so that investment is at the margin, rather than transformative. The What Works Centre for Local Economic Growth at the London School of Economics has reviewed 29 impact evaluations that met minimum standards of evidence (WWC, 2015). Key findings, mostly based on a small number of studies, include:

- Road projects can positively impact local employment. But effects are not always positive and a majority of evaluations show no (or mixed) effects on employment
- Road projects may increase firm entry (either through new firms starting up, or existing firms relocating). However, this does not necessarily increase the overall number of businesses (since new arrivals may displace existing firms).
- Both road and rail projects tend to have a positive effect on property prices, although effects depend on distance to the project (and the effects can also vary over time)

The general lessons from this review of transport investments are:

- The economic benefits of transport infrastructure spending – particularly as a mechanism for generating local economic growth – are not as clear-cut as they might seem on face value.
- Arguments for spending more in areas that are less economically successful hinge on the hope that new transport is a cost-effective way to stimulate new economic activity. We do not yet have clear and definitive evidence to support that claim.
- Our findings raise fundamental questions about scheme appraisal and prioritisation, and about the role of impact evaluation in improving decision-making around transport investment.

Transport investment in London

The population of London is growing quite rapidly, but the city long ago decided not to accommodate additional car use, so the share of journeys by car has fallen from a peak of 50% of all trips in 1990 to 37% currently, with further decline to about 27% expected by 2050 on the basis of forecast population growth (central case) and continuing policies to invest in rail but not increase road capacity. Figure 2 shows an estimate of the share of journeys by car in London over the century 1950-2050. This exemplifies the concept 'Peak Car in the Big City'.

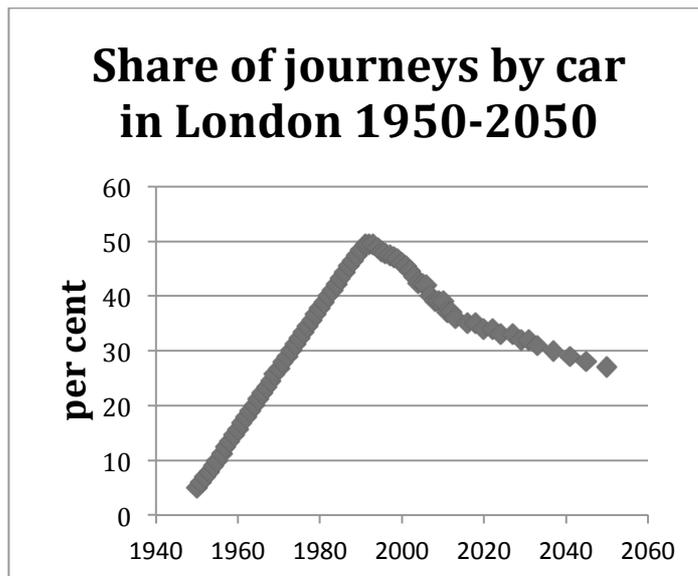


Figure 2 Source Metz (2015)

London is thriving - economically, culturally and socially – both despite and because of the decline in car use. Two key policies are largely responsible: a road capacity constraint plus parking controls in the inner boroughs and congestion charging in the centre; and major investment in rail that provides speedy and reliable travel for work trips, compared with the car on congested roads. As we see at Canary Wharf, well paid professionals can be attracted out of their cars onto trains through the stick of limited parking and the carrot of frequent fast rail services. In contrast, cities that rely on buses for public transport find it much more difficult to get commuters out of their cars.

The Mayor of London is responsible for both the transport system and for spatial planning, a helpful combination which contributes to the success of the city. The London Infrastructure Plan 2050 outlined options for investment in transport and other infrastructure to respond to population growth from 8.6m currently to 11.3m central estimate by mid-century and the corresponding growth in employment. This spatial plan provides a suitable strategic context for specific schemes such as Crossrail 2.

The economic case for each individual scheme will need to be made. This case needs to be grounded on evidence-based expectations of the benefits, in particular development of real estate (land and property) that will accommodate jobs and homes. Benefits from travel time savings should be counted only when these can be observed. Notional benefits from ‘wider impacts’ would be subsumed within market values of property and rents.

Given that the long term benefits from transport investment are found as real estate development, Transport for London should work closely with developers and planners to secure the benefits from its investment. In favourable cases, the enhancement of land values may be sufficient allow the developers to contribute to the cost of the transport investment.

Transport investment in Northern cities

The example of London argues for a spatial plan to provide the context and rationale for transport investment in the Northern cities to accommodate population and economic growth. One possible outcome, perhaps tacitly, would recognise Manchester as the main centre of the region, with an emphasis on the development of that city as a centre for business services. Another, perhaps politically more feasible, would be a multi-centric region of medium sized cities, somewhat analogous to the Thames Valley, with a mix of manufacturing and services. One key question is how to take advantage of the research potential of the universities, both for the cities in which they are located, and across the region. Related to this is the question of where to locate business in relation to the availability of skilled staff (it is noteworthy that Amazon has recently moved its UK HQ from Slough to central London).

At present there is no mechanism for spatial planning across the Northern cities as a group, and hence no consideration of options for location of population and economic growth across the region. Absent a spatial plan, decisions on transport investments will be an important influence on spatial development in ways that need to be addressed as part of the investment case.

It is not straightforward to develop a persuasive case for specific investments in the context of the Northern cities. Estimates of benefits based on travel time savings give no indication of the spatial location or likely scale of development. Estimates of 'wider impacts' depend on either rules of thumb or ambitious modelling which cannot be validated. It is therefore hard to say how transport investments will benefit the economies of these cities, based on conventional appraisal methods.

It is easier to predict changes in land use arising from transport investments that change travel to work patterns. Faster travel may be expected to result in people seeking housing and employment opportunities further afield. This would both improve the efficiency of labour markets and create opportunities for housing developments. For rail investments in particular, the location of new housing should be planned as part of the investment case.

Urban rail investments can allow cities to grow to higher density while meeting the mobility needs of the population. Regional rail plays a similar role. The tram-train being piloted at Sheffield-Rotherham is a relevant innovation. Bus rapid transit likewise provides speedy, reliable travel but at a cost lower than light rail (trams). Higher urban population densities generate agglomeration benefits, not only economic but also cultural and social, which enhance the attractiveness of cities, provided other aspects of urban liveability receive adequate attention. Accordingly, both urban and regional rail investments justify positive consideration.

What is unclear, however, is the extent to which better regional rail links that improve connectivity *between* cities would generate economic benefits over and above those associated with housing and labour markets for individual cities.

Road investments are even more problematic. For instance, the scheme to enlarge the M62 to four lanes along its entire length is intended to support the Northern economy but would induce local commuter use that would limit the benefits to long distance users. A new road link, largely in a tunnel, between Manchester and Sheffield might be of less benefit to commuters but would be expensive and hard to justify for improved connections between two cities that are otherwise well connected. More generally, road investments intended to improve connectivity within the region, whether north-south or east-west, are likely to be nullified by the stimulation of local use. Altogether, the ambitious plans for road construction set out in the Northern Transport Strategy seem of very uncertain benefit, albeit more consistent with a multi-centric region in which manufacturing remains important.

On the other hand, the plans for integrated information and ticketing across all public transport modes, part of this Strategy, are clearly sensible and, as digital applications, may be expected to be far more cost-effective than investment in civil engineering technologies. More generally, opportunities should be sought for other digital technology investments to improve the operations of the transport system and to enhance the experience of users. Predictive journey time information on the road network is one important possibility.

Modelling and forecasting

The standard approach to justifying transport investment of any scale involves modelling that compares a 'do something' case (ie with the investment) with a 'do minimum' case (without the investment). Most models estimate travel behaviour changes in the absence of land use change, generating travel time savings resulting from the investment that are used as inputs to the economic appraisal. However, for reasons previously discussed, assuming no changed land use is not consistent with evidence from completed schemes. Models that integrate transport and land use are available, although not generally employed.

Modelling involves much uncertainty, many simplifying assumptions and limited data for calibration. Transport models cannot be independently validated. Given the considerable judgement involved in generating plausible outputs, it is not surprising that modelling is generally found to support the inclinations of the authorities that commission the studies. When such authorities are bidding for central government funds, other people's money, modelling will generally be found to support the bid.

A further difficulty with transport models is the routine assumption that the future will be like the past, with change driven only by exogenous parameters such as GDP growth, population growth, oil prices etc. But if the future is different from the past, as is indicated by the peak of car use in London (shown in Figure 2) and similar indications for Birmingham and Manchester (Metz, 2013), then forward looking relationships (elasticities) need to replace historic calibration data. This is difficult to achieve in practice. For example, the DfT's

National Transport Model has not yet recognised the emergence of peak car use in London and so forecasts substantial increases in car traffic in this city.

Conclusions

The transport system moves people and goods through space. New investment adds to this movement, the benefits being reflected substantially in changed spatial distribution, not reductions in travel time. The difficulties that the Commission is likely to experience in making recommendations for transport investment derive in part from shortcomings in existing methodologies, in particular that conventional economic appraisal is based on estimates of notional times savings and disregards the evidence for changed land use and real estate development as important benefits of investment. Moreover, conventional travel demand modelling and forecasting does not recognise important recent changes in behaviour, as reflected in the peak car phenomenon.

For its medium term work, the Commission might wish to review these methodological issues. More generally, there may be a role for the Commission to act in ways analogous to the Office for Budget Responsibility and the Committee on Climate Change, offering advice to national and local government on the merits of infrastructure investment based on independent analysis, both of methodologies and of substance.

In London, expected economic and population growth is the main determinant of future transport investment, which is therefore relatively unproblematic in principle. For the Northern cities, such growth is less obviously a given, and a desired role for transport investment is to foster growth. However, the prospects for speculative transport investments are uncertain. Hence to secure the benefits of transport investments, decisions should not be taken in isolation but as part of planned real estate developments involving both developers and planning authorities. Decisions on urban and regional rail investments seem more straightforward than for road investments, for which there is a good case for preferring cost-effective digital to costly civil engineering technologies.

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4 January 2016

[contact redacted]

RE: NATIONAL INFRASTRUCTURE COMMISSION CALL FOR EVIDENCE

I am writing on behalf of the Ebbsfleet Development Corporation (EDC) in response to the call for evidence on National Infrastructure needs.

Ebbsfleet Development Corporation

The EDC has been established by Central Government to deliver Ebbsfleet Garden City: a development of up to 15,000 new homes in North Kent, with new employment opportunities and supported by transport, utility and community infrastructure. Blue and Green infrastructure will also be an important and defining characteristic. The recent announcement of Enterprise Zone status and securing £310 million of funding to support infrastructure will result in a high level of activity in developing the garden city and since is now over 1.2 million square metres of commercial, retail and leisure uses consented across the Garden City resulting in both residential and commercial growth.

Ebbsfleet Garden City is to be delivered at pace aspiring to provide a high quality built environment. It is anticipated that the impact of the Garden City will be felt beyond the EDC's boundary, with a positive ripple effect locally (particularly in Dartford and Gravesham boroughs), both in the residential and commercial markets. Whilst it is not possible to quantify this as this time, anecdotally a positive uptake in the housing development and developer interest is being reported locally following the Garden City announcement.

Existing Strategic Context and Connectivity

From a transport perspective, Ebbsfleet Garden City is very well located; existing rail connections provide both high speed (HS1) and conventional rail services into London from three local stations: Ebbsfleet International, Northfleet and Swanscombe. Central London is therefore within 17 minutes of Ebbsfleet Garden City, with excellent connectivity into the wider Kent region too. The presence of direct Eurostar services additionally means quick and easy access to continental Europe.

Rail infrastructure is therefore one of the key attributes and requirements of Ebbsfleet Garden City as future destination for living, working and leisure. In response to the questions asked by the NIC the following key infrastructure improvements are hugely relevant:

Upgrading the A2

Upgrading the A2 is identified as one of the top 40 infrastructure items in the NIC under the strategic road network capacity heading. The delivery of the Garden City is heavily dependent on there being sufficient capacity in the local and trunk road network. Whilst the primary infrastructure of HS1 will take some of the strain for the commuting population, the homes under development at Castle Hill, the National Grid site, at Northfleet and at Ebbsfleet and the rest of Eastern Quarry, along with the advent of the London Paramount resort in 2021, will mean that an improved A2 needs to be functioning at optimum levels. The two crucial junctions are Bean junction and Ebbsfleet junction which unusually for a dual carriageway are within 1 mile of one another on the A2 to the south of the Garden City and the sites referred to above.

Ebbsfleet International Station

Following initial studies by HS1, there will be a need to upgrade the station building at Ebbsfleet International should the major international resort London Paramount come to fruition, to ensure that it has sufficient capacity to cope with future customer projections. This will include changes to facilitate pedestrian flow, way finding and both core and non-core facilities to ensure an excellent service and environment for all types of customers, noting particular that the London Paramount resort proposals will mean a more two way flow, as opposed to the current, near tidal operation.

Rolling Stock

Following initial studies, it is apparent that new rolling stock and train services will be required to cope with the large increase in future customer demand, particularly at peak commute times and during new weekend peaks created by the London Paramount Resort. The quality of service delivered along the track and at stations, both during and after construction, must be protected to prevent disruption to train operations and the travelling public.

Lead in times for procurement of rolling stock are lengthy and need to be planned accordingly to avoid the negative public perception of the railway and corresponding detrimental impact on the new developments and the Garden City.

Crossrail

A safeguarded Crossrail route already extends beyond Ebbsfleet from Abbey Wood to Hoo Junction. When seeking to deliver a garden city in the 21st Century this route is seen as an obvious opportunity that the EDC should pursue. The EDC feel that extending Crossrail from its current terminus at Abbey Wood to the stations at Swanscombe or Northfleet or Gravesend along the existing protected route would be extremely beneficial to growth in the vicinity. An extension into Ebbsfleet International Station would connect much of the rest of Kent into this service, particularly to Heathrow.

This infrastructure is imperative to attract development and investment in the Ebbsfleet area and as such the EDC has joined with Bexley Council, Kent and TfL in preparing a joint submission sent under separate cover. Provision of this Crossrail extension provides a further direct route from London, improving the Ebbsfleet location for commuters and hereby increasing housebuilder confidence in the location. It further increases commercial and employment potential in the area and continues to assist in opening up North Kent/ East London as future centres for development. North Kent’s development plans and population growth form an attractive proposition for new companies from the UK and overseas to relocate or expand here. For this to happen road and rail infrastructure must be improved and capacity increased.

Yours sincerely,
Louise Wyman
Director of Strategy

www.ebbsfleetdc.org.uk



Ebbsfleet Development Corporation • North Kent Police Station • Thames Way • Gravesend • Kent • DA11 8BD

England's Economic Heartland
Programme Office
c/o Buckinghamshire County Council
County Hall
Walton Street
Aylesbury
HP20 1UA

8th January 2016

Dear Sir,

National Infrastructure Commission: call for evidence
Response of England's Economic Heartland Strategic Alliance

The Strategic Alliance is a non-statutory partnership whose participants share a collective ambition to realise the potential of England's Economic Heartland. Its participants are committed to looking beyond current success and, through collaborative working to a common purpose, raise levels of productivity to match, and where possible exceed, those of global competitors by addressing the identified barriers to economic growth.

As an Alliance of strategic authorities and their constituent LEPs, the partnership represents almost 3.5 million people from:

- Oxfordshire
- Buckinghamshire
- Northamptonshire
- Milton Keynes
- Luton
- Central Bedfordshire
- Bedford
- Cambridgeshire

It is an expressed aim of the Alliance to seek to become a statutory Sub-National Transport Body. The Alliance partners are also committed to developing a strategic infrastructure plan whose scope reflects that of the Commission: a recognition by the partners of the critical importance that strategic infrastructure has to play in supporting planned growth.

Given these ambitions, the proximity of the Heartland to London, the Midlands and North and our shared issues with connectivity, London transport infrastructure and energy supply, the Alliance looks forward to working closely with the Commission as it looks to advise Government on future infrastructure investment priorities.

Connecting Northern Cities

1. ***To what extent are weaknesses in transport connectivity holding back northern city regions (specifically in terms of jobs, enterprise creation and growth, and housing)?***

2. ***What cost-effective infrastructure investments in city-to-city connectivity could address these weaknesses? We are interested in all modes of transport.***
3. ***Which city-to-city corridor(s) should be the priority for early phases of investment?***
4. ***What are the key international connectivity needs likely to be in the next 20-30 years in the north of England (with a focus on ports and airports)? What is the most effective way to meet these needs, and what constraints on delivery are anticipated?***
5. ***What form of governance would most effectively deliver transformative infrastructure in the north, how should this be funded and by whom, including appropriate local contributions?***

The Alliance makes no response to these questions but raises the matter that the success of economic initiatives in the North are in no small part dependent upon the infrastructure connections through and across the Alliance area, particularly through improved radial and orbital movements from London and the South Coast by road and rail.

London's transport infrastructure

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

London and its commuter hinterland face significant economic and social challenges in the short, medium and longer term. Unless drastic changes are made over the next two to three decades, congestion will have a severe impact on the economy and people's daily lives, with many journeys being effectively impossible. Forecasts show that additional transport capacity is required across the wider South East but this should not necessarily be through continued emphasis on focusing exclusively on radial connectivity. New or improved strategic road and rail infrastructure across the wider South East will change travel patterns thereby supporting economic development in the wider South East and at the same time provide some relief to the demand on traditional radial corridors serving London. In addition to giving rise to wider beneficial impacts for London and England's Economic Heartland, such an approach would be consistent with the Government's ambition to rebalance the economy.

It is clear from our engagement in the emerging London Plan, that the economy will continue to be over-heated in the city and there will be difficulties in meeting the housing demand that comes with this. It has also been accepted that the South-East supports London growth by delivering homes to meet the current and planned growth through our own housing allocations. A sub-national approach to strategic planning will be needed to avoid offsetting this economic growth by extending radial links outward to bring labour to jobs; rather there needs to be a shared aim to re-balance the economy across the South East (and indeed to the north as well) and seek to reduce the need for journeys through/to London by providing much needed infrastructure to support economic growth in the wider South East. This will allow London to meet more of its own need whilst supporting a more balanced economic approach.

Some of the fastest-growing towns and cities in England are located in a belt to the north of London which already enjoy some strong, albeit well-used, links which support London. England's Economic

Heartland – with an economy worth £90bn but with the potential to grow another 20 per cent - clearly has the potential to help offset some of the over-heated economic impacts on London so that existing radial networks can more efficiently serve in and out-commuting to meet demand. The economic potential of the Heartland area reflects its competitiveness in global markets, driven by its leadership in the digital economy. Our approach to investment in transport infrastructure must avoid reinforcing traditional patterns of movement when economic growth derives from the new economy.

England's Economic Heartland sits on the busy road and rail transport corridor between the south coast ports, the Midlands and the north and enjoys easy links to London and the West Midlands via the M40. However, it suffers a lack of east-west connectivity, in particular to the high-value growth areas around Milton Keynes and Cambridge, and also in terms of access to/from the international gateway at Luton Airport (including business aviation needs arising from businesses in the Heartland area operating in the global market).

There are currently no direct rail connections between the centres of Oxford and Cambridge and to the areas in between (forcing commuters to travel into London in order to come out again), while travel by road involves cross-country single-carriageway routes or use of the M25 around London. Improving the connectivity on this corridor – through East-West Rail and the Oxford to Cambridge Expressway projects - will place the authorities in the Alliance at the centre of the south-east orbital corridor as a key hub for south-west to north-east transport. As a result, England's Economic Heartland would realise further improvement in agglomeration opportunities for jobs, growth and innovation, with its vastly-improved road and rail links to these high-value centres of the UK economy.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

The focus for investment to help London should not solely be within London. Existing radial routes, much the focus of current and previous national investment, serve to provide vital lifelines for labour supply to meet London's booming economy. While the Heartland area has good radial connections into and out of London, the service level on transport connections across much of the area - for example, including between major economic hubs such as Oxford, Cambridge, Aylesbury, Milton Keynes and Luton – is notably poor, a consequence of existing high levels of economic activity and travel demand already looking to avoid the need to transit the London area.

The lack of transport for people and freight between these areas creates an artificial barrier between hubs of knowledge-based growth. This area was recently recognised as being the most innovative part of the UK - connectivity between this area, and particularly north London, will not only reinforce London's and the UK's attractiveness in terms of investment, but as the area also links very well to the North West and North East, it provides a good platform for linked innovation growth in the Midlands and Northern Powerhouses.

Pushing forward with plans to complete East-West Rail and the Oxford to Cambridge Expressway (including vital links to the A34 linkage to the South Coast ports) provides a critical and long overdue outer-orbital that complements growth in London by reducing the need for traffic to transit through

it, supports the Alliance partners to realise the potential of England's Economic Heartland, as well as enabling the logistical needs of the national economy to be supported.

- ***How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?***

East-West Rail will reconnect Oxford to Milton Keynes and Cambridge by rail, and direct rail access from the west into Heathrow. This is due for completion in Control Period 6, post 2019 and must not slip any further in delivery.

In addition, work on the Oxford to Cambridge expressway is underway and we are working with Highways England to develop a route based strategy linking Southampton and the East Midlands, which will include improvements to the A34 and the development of an expressway to connect the two growth centres, linking up major economic hubs along the way (i.e. Milton Keynes, Aylesbury, Luton). England's Economic Heartland will put forward an initial statement of investment priorities in autumn 2016 as part of the input into the review of the Road Investment Strategy (due to be reviewed in 2017) and the related review of the rail infrastructure review.

- ***What might their potential impact be on employment, productivity and housing supply in London and the southeast?***

Work to date has demonstrated that improvements in economic productivity across the Heartland area would generate an additional 20% GVA per annum – equivalent to c£10bn per annum. Just as important, a failure to invest in the Heartland will result in the level of service on existing infrastructure declining making existing business activity increasingly uncompetitive in global markets. A decline in economic performance would reduce the Heartland's net contribution to the Exchequer, thereby reducing the scope for investment by Government across the UK.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

No comment.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

- ***What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?***

If there was to be evidence of a proper regional distribution of investment and growth in support of London, then regional contributions to the solutions would be defensible and fair. The uplift in growth realized through delivery of both East-West Rail and Oxford to Cambridge Expressway will be significant and would need to be reflected in some way. The Alliance members already have a well-established partnership in support of East-West Rail contributing over £45m to its delivery. Furthermore, the likelihood of such an arrangement would be improved should the Alliance be

successful in its attempts to become a Sub-national Transport Body as provided for in emerging legislation.

- ***What innovative funding mechanisms could be considered to support delivery of key schemes?***

Notwithstanding the potential to deploy innovative financing mechanisms to deliver key schemes, the cost of those schemes will ultimately have to be met from one of three funding sources – the user or beneficiary of the infrastructure, local sources of funding (council tax payers or local businesses), or central Government investment.

5. *How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?*

No comment.

Electricity Interconnection and Storage

The responses in this section are based on our experience of the grid or distribution network in Oxfordshire, however they are reflective of the challenges faced across the Heartland area. The Alliance partners commitment to develop a strategic infrastructure plan reflect a recognition on their part that the issues need to be addressed at a sub-national scale

The questions below assume that the installation of renewable energy generation is proceeding unhindered so as to provoke the need for balancing of supply and demand, including deploying energy storage. Unfortunately, this is not the case.

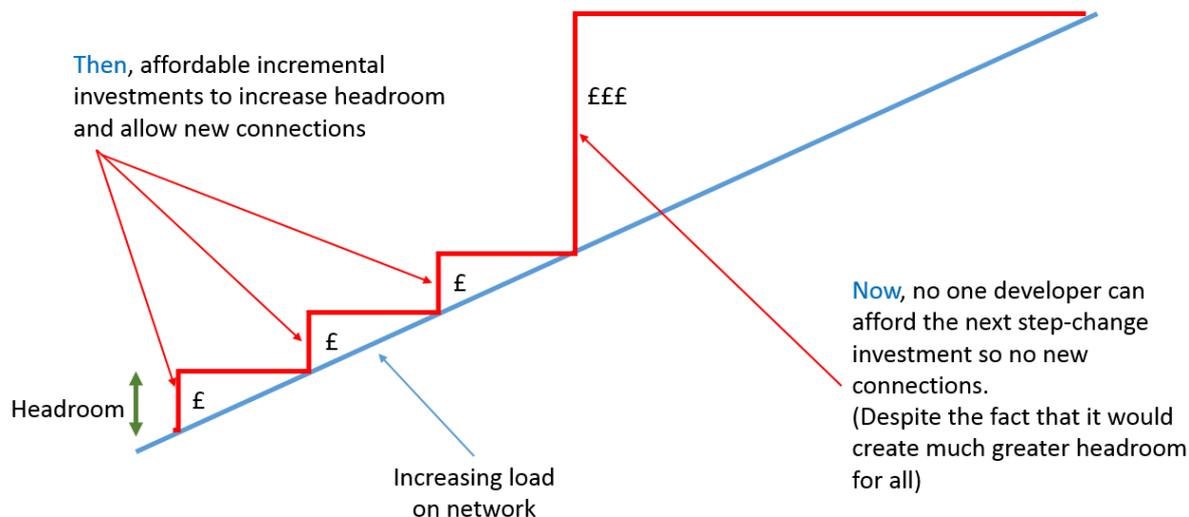
It is worth pointing out that there are two fundamental issues:

- There is an acute need to invest in renewable energy to diversify and add to current supply to meet demand; and,
- There is a need for additional capacity full stop to support large scale economic/housing growth.

The local market for connecting new renewable energy schemes to the distribution network has effectively failed. All of the sub-stations operated by Scottish and Southern Energy Power Distribution (SSEPD) across Oxfordshire for example, are constrained by fault levels. So, in practical terms, there will be no new large installations (above 50kW) in Oxford for the foreseeable future. In Bicester, there will be no new renewables, nor allocation of new supply connections until 2019 at the earliest. There are similar examples from elsewhere in the county: In November, a £240k solar PV scheme in Chipping Norton, Oxfordshire, was recently quoted a connection cost of £437k with a delay of two years, making the scheme unviable.

As elsewhere across the Heartland area, Oxfordshire's local grid needs significant investment to make it fit for the 21st century. It needs to move from a centralised energy system designed to distribute electricity in one direction to the smart system needed to manage embedded generation and storage, as well as the increasing up-take of electric vehicles. At present, this is funded by individual developers as they request a connection. We have reached the point where no one individual developer can afford the cost as shown in Figure 1 – The Investment Hurdle

Figure 1 – The investment hurdle



We also believe there is a significant information failure in this market: scheme developers are unaware of each other, making it difficult to pool resources. The Distribution Network Operator (DNO) reacts only to firm requests to connect rather than taking a strategic view based on the much wider range of information available. The Alliance suggest that the regulatory framework within which the 5-year investment plans are prepared by the operators (and approved by the Regulator) must be required to take into account the strategic growth identified by local partners. We feel the most efficient and effective way of doing this would be at a sub-national level reflecting the reality that networks extend beyond individual local authority boundaries.

The current approach is inefficient thereby increasing costs to developers – in re-scaffolding when limits on schemes size are relaxed or in abortive costs when schemes turn out to be financially unviable because of the high cost of connection.

To develop as it should, the energy grid needs mechanisms to facilitate funding in advance of a connection request, based on a strategic vision of the development of the grid. There may also be a 'public good' argument for investment in the grid, analogous to investment in other infrastructure such as roads and broadband.

The strategic vision needs to be owned by local stakeholders as much as the DNO. This requires much greater dialogue between planners, the DNOs and major users to avoid pinch-points blocking development, as is happening in Bicester with knock-on impacts on Oxfordshire's economic growth.

The Alliance suggests that an obligation should be placed on the DNO to work with sub-national bodies to identify the longer term strategic needs for additional installed capacity – and then a requirement on the regulator to take that into account when agreeing to specific 5-year investment plans. The Alliance partners are keen to work with the Commission to develop its thinking in this area with a view to shaping the remit of the Commission moving forward (and ensuring future legislation is fit for purpose).

We would also like to see greater use of the Ofgem innovation funds to help support the area's long term innovation and growth strategies. Exploring smart solutions to fault-level constraints is key as is

supporting the innovative work we are doing in the electric car market which impacts on the grid and could provide a balancing function. In this example, the electric car is part of the storage chain and adds a wider value to the energy use/storage cycle without the need for wider storage investment. This presents a huge opportunity, so reinforcing the point that forward planning must improve.

1. *What changes may need to be made to the electricity market to ensure that supply and demand are balanced, whilst minimising cost to consumers, over the long-term?*

Investors need a secure and equitable investment environment with clear long-term signals within which to plan multi-year projects that have investment and construction timescales that extend well beyond the timeframes associated with regulatory reviews. The recent reviews on rail infrastructure investment have noted the difference in terms of cost and efficiency of large scale investment schemes handled outside the 5-year regulatory framework (i.e. Crossrail and Thameslink) with those handled as part of the regulatory framework (i.e. GWML electrification) – if Government is sympathetic to shifting more strategic schemes outside of regulatory frameworks then one could see a similar approach being applied to other sectors. The Alliance wants to work with the Commission to explore this opportunity further. Without this environment, new energy supply projects will not come forward at the rate needed

At the local grid level, for example, Oxfordshire's thriving community sector is already demonstrating balancing projects which have significant potential:

- Project **ERIC** (Energy Resources for Integrated Communities) is an initiative bringing solar PV power and smart energy storage to up to 100 homes in Rose Hill, East Oxford. Project ERIC is led by Moixa Technology and Bioregional and is part-funded by Innovate UK. Using domestic Maslow batteries and a new software platform, Project ERIC aims to demonstrate how distributed storage in a community can be managed to reduce average peak grid load by 65% and increase self-consumption of local PV energy across the community by twofold¹.
- The award winning **Energy Local** project aims to use smart technology systems to pool community demand so that members can access the time of day tariff and locally generated renewable power directly, adjusting demand to reflect local generation².

The market needs to facilitate local initiatives such as these by minimising the cost and resources needed to participate. Whilst they will initially contribute to local balancing, they can of course contribute to the national balancing market at scale, which is the long term intention.

What role can changes to the market framework play to incentivise this outcome:

- ***Is there a need for an independent system operator (SO)? How could the incentives faced by the SO be set to minimise long-run balancing costs?***

There is a major need to upgrade the local grid in Oxfordshire so that it facilitates new approaches to the generation, storage and use of electricity rather than blocking them as at present. Such an upgrade will also require a change in the role of the District Network operator (DNO) to an

¹ <https://localisedenergyeric.wordpress.com/>

² <http://www.energylocal.co.uk/>

independent system operator, if not a new operator. The incentive scheme should encourage the strategic rather than reactive management of the network in partnership with local stakeholders. It could also remove the barriers in the current system which mitigate against long term strategic investment.

- ***Is there a need to further reform the “balancing market” and which market participants are responsible for imbalances?***

As above

- ***To what extent can demand-side management measures and embedded generation be used to increase the flexibility of the electricity system?***

Oxfordshire has shown that community energy initiatives, such as ERIC and Energy Local, can make a significant contribution to both demand-side management and embedded generation. In particular, the Low Carbon Hub has demonstrated that there is a strong demand for local investment opportunities. It must be recognized though that this is only part of the supply offer to meet what will be significant growth in the Alliance area.

At present, this is held back by fault level constraints and by the failure to develop a smart grid in the county.

2. What are the barriers to the deployment of energy storage capacity?

- ***Are there specific market failures/barriers that prevent investment in energy storage that are not faced by other ‘balancing’ technologies? How might these be overcome?***

Battery-based storage is still expensive. Further government investment in battery innovation, testing and de-regulation are required for example to meet the challenge of creating a step change and shift away from carbon-based engines. The Alliance area is at the forefront of this and needs continued investment to succeed.

Some energy storage devices, such as batteries, can contribute to fault levels. At present, fault level constraints in Oxfordshire and the consequent market failure limit the roll-out of such devices at scale. This basic issue needs addressing as described above.

- ***What is the most appropriate scale for future energy storage technologies in the UK? (i.e. transmission network scale, the distributed network or the domestic scale.)***

All scales are appropriate to make the best fit with the technology and source of funding eg pumped storage will work at the transmission network scale. In contrast, businesses, schools and households will invest in small-scale battery storage which in aggregate will make a significant contribution.

3. What level of electricity interconnection is likely to be in the best interests of consumers?

- ***Is there a case for building interconnection out to a greater capacity or more rapidly than the current ‘cap and floor’ regime would allow beyond 2020? If so, why do you think the current arrangements are not sufficient to incentivise this investment?***

- ***Are there specific market failures/barriers that prevent investment in electricity interconnection that are not faced by other 'balancing' technologies? How might these be overcome?***

We assume these questions relate to interconnection at the level of the transmission network and therefore have no comment.

4. What can the UK learn from international best practice in terms of dealing with changes in energy technology when planning to balance supply and demand?

How best to roll out and use a smart grid to make more efficient use of the grid asset.

The Alliance partners look forward to working closely with the Commission as it discharges its functions. If you need any further information in response to this submission please contact me on [\[email redacted\]](#)

Yours sincerely

Martin Tugwell
Programme Director

6th January 2016

National Infrastructure Commission
1 Horse Guards Road
London
SW1A 2HQ

Dear Sir/Madam,

Response to the National Infrastructure Commission Call for Evidence - future investment in the London's transport infrastructure

Enterprise M3 is responding to the National Infrastructure Commission Call for Evidence and in particular the request relation to future investment in the London's transport infrastructure.

Enterprise M3 is the Local Enterprise Partnership for an area which covers parts of the counties of Hampshire and Surrey, including north and central Hampshire, and western Surrey up to the M25. The LEP area includes major centres such as Aldershot, Winchester, Basingstoke, Woking and Guildford. In total, the LEP area encompasses over 1,600,000 residents and 86,500 businesses; accounting for nearly 20% of the South East's economic prosperity.

The LEPs remit is to support and sustain economic growth at a local level and Enterprise M3 has set out its vision, key priorities and actions in its Strategic Economic Plan, which was published in March 2014. The SEP sets out a clear vision of what the LEP and its partners plan to do over the period up to 2020/21 to create new jobs, increase the number of business start-ups and improve the productivity of local businesses. Improvements to transport infrastructure to enhance connectivity are a key part of this Plan, which identifies a series of infrastructure improvements that are part of the 'strategic ask' for transport investment, to improve connectivity within our area, to ensure that the LEP can thrive economically, maximise job creation and attract inward investment from businesses.

The work of the Enterprise M3 LEP is endorsed by government as part of its strategy for developing the UK economy and is driven by close collaborative working with local authorities, the business community and other stakeholders in the area. The Enterprise M3 Growth Deal encapsulates the priorities that have recently been agreed with government in response to the needs and priorities that we have identified with our local, public and private sector partners.

What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

Enterprise M3 is particularly concerned by the potentially dismissive reference in the question to the South East as London's "commuter hinterland." If the Commission is going to achieve its aims it is essential that it recognises that the importance of the economy of the areas around London in its own right and not merely as an area that serves the needs on London. Economic success in the wider South East benefits London and indeed the whole of the UK. It is worth highlighting that the South East pays considerably more in taxes than it receives in public spending – creating a net 'profit' for the Treasury. Indeed the South East was the biggest net contributor over the 10-year period 2002-12, generating a profit of £80bn for the Treasury; this compares to London's £74.8bn over the same period.

Notwithstanding this, key social and economic challenges the LEP would highlight are:

- Meeting the Government's productivity aspirations and encouraging a higher-skilled workforce for contribute to the local economy.
- Provision of new homes and business space in appropriate locations.
- Delivery of a very large expansion in the supply of housing.
- Enhancing economic interactions and labour mobility through connectivity improvements.
- Being able to deliver transport infrastructure and capacity so that it does not act as a constraint on economic growth as well as meeting the skills and housing challenges identified above.
- Achieving certainty over expansion associated with increased airport capacity in the South East and ensuring that associated infrastructure is provided.
- Improvements to cross country road and rail routes linking South East economic areas without the need to travel via Central London reducing associated congestion.
- Better road and rail access to nationally important ports and airports to boost their attractiveness as business locations and improve connectivity to international markets.
- Reducing congestion and removing bottlenecks on strategic road corridors.
- Improved journey times on the major rail lines into London for business travellers and commuters.
- Enhancements to the attractiveness of the area for new investment, including foreign direct investment.

Improving strategic transport routes in the South East will support economic growth both nationally and locally bringing a significant return on investment for public funds. By failing to invest there is a risk of adding to the congestion, frustration and costs that businesses across the UK face when using the South East strategic transport corridors including as gateway routes to London and the South East's international ports and airports. Investment is needed to maintain the attractiveness of the area for business and to secure the delivery of key development sites, new homes, new commercial floor space and new jobs. Without strategic investment in high quality transport infrastructure London and the South East runs the risk of losing businesses to international competitors.

It is no accident that the world's leading companies see London and its surrounding areas, including the Enterprise M3 area, as the place to locate and do business. The halo effect of London supports jobs in the wider South East and the whole UK. Enterprise M3 would also advocate stronger collaborations between London and the LEP areas that surround London.

What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

Enterprise M3, Coast to Capital, Solent and Thames Valley Berkshire Local Enterprise Partnerships, working closely with the local highway authorities, have jointly commissioned an economic impact study that addresses exactly this question for our area.

The work will identify, describe and quantify the economic case for improving connectivity in major strategic movement corridors across South East England.

The work is developing an economic methodology to identify and define the movement corridors. The development of the corridors will address known and forecast problems such as improved connectivity through faster and more reliable journey times. They will be prioritising the corridors, identifying potential solutions for delivering change and providing an outline business case for potential infrastructure investments. This study is due to report early later this month and the LEPs will be happy to share the results of this work with the Commission.

What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Enterprise M3 is also responding to the consultation on Crossrail 2, so attached is a copy of our response, which addresses this issue in relation to the benefits of the proposed Crossrail 2 scheme and the need for investment in other rail infrastructure on the South-West Mainline.

What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

Investment in infrastructure is fundamental to achieving economic growth. Key to success in funding its provision is de-risking investment and development and creating more certainty about funding for infrastructure provision. This will ensure that the infrastructure of the area is able to support, enhance and facilitate economic growth, boost productivity and improve the standard of living.

There are many different funding models available but Enterprise M3 believes that the type of approach used to fund schemes is not as important as having certainty that funding will be available over a sustained period of time. This will ensure that infrastructure schemes can be developed, with certainty that the funding is in place for their delivery. Such certainty engenders confidence and will allow scheme promoters to commit resources to scheme development and enable businesses to plan for the future, assured that the infrastructure needed for economic growth will be forthcoming.

This is of particular important to secure housing growth and in this instance it may be that Government needs to effectively underwrite public/private funding sources, to provide a level of certainty for the accelerated delivery of housing by the private sector that is being sought.

How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

No comment

Yours faithfully,

A handwritten signature in black ink that reads "Kevin Travers". The signature is written in a cursive style with a long, sweeping underline for the name "Travers".

Kevin Travers
Project Manager Transport Enterprise M3 LEP

London's Transport Infrastructure

Essex County Council Submission to the National Infrastructure Commission Call for Evidence
11 May 2016

1. **Essex County Council (ECC) welcomes the opportunity to contribute to the national debate on transport infrastructure via the inquiry being undertaken by the National Infrastructure Commission. Improvements to transport infrastructure in and around Essex are vital to unlock growth in the London City Region and connecting London businesses and communities to these centres of economic opportunity, international gateways and key labour markets.**
2. **Given the key role that infrastructure in Essex (for example London Stansted airport, the M11, A12, West Anglia Mainline and Southend airport) play in enabling growth in the Capital, we would be delighted to provide further evidence to the Committee in person.**
3. Greater Essex connects businesses across London and the South East to world markets through airports at London Stansted and Southend and major port clusters in South Essex and Haven Gateway. It also provides a labour force of more than 149,000, contributing some over £10bn per year to the capital's economy. However, to sustain this connectivity our infrastructure needs investment.
4. The rail network in Essex that connects commuters to London and beyond is already operating at capacity, on the West Anglia Mainline [WAML] journeys between London and Stansted airport are longer than some of the flights to destinations the airport serves, reducing the attractiveness of this as a place to live, work and travel from and to.
5. Our ports are some of the largest in the Country connecting businesses to London but, without investment in the surrounding road and rail network we risk being left behind as logistic operators choose elsewhere with better, more reliable connectivity.
6. Stansted Airport is the only major airport in the Southeast that has the immediate capacity to grow within its existing permissions. It has capacity to take a further 13 mppa, from 22 mppa to 35 mppa within current planning permissions and has permissions to operate 264,000 Air Traffic Movements (ATMs) per year (243,500 passenger ATMS and 20,500 cargo ATMs) without the need for major further capital investment in the airport. However, improvements to surface access will be required.
7. Southend airport already has the immediate capacity to grow within its existing permissions. It can double from 1 million passengers per annum (mppa) to 2 mppa within current planning permissions and has permissions to operate 53,300 Air Traffic Movements (ATMs) per year without the need for major further capital investment.
8. However, whilst both airports have the capacity to grow within existing permissions and realise wider economic benefits for the London-City region, they are constrained by surface access.

9. Stansted airport is constrained by capacity on the strategic road network particularly the M11 J8, A120, M11 J8 – J9 and A14. It is further constrained by capacity, reliability and journey time of the West Anglia mainline “Stansted Express” service from London Liverpool Street. Southend airport is constrained by the capacity and reliability of the A127.
10. The Dartford Crossing is the only fixed road crossing of the Thames east of Greater London, however it is the busiest estuarial crossing in the United Kingdom, with an average daily use of over 150,000 vehicles.
11. Our response lays out our proposals on improvements to transport infrastructure in the London City-Region for consideration by the Commission and centres on opportunities in the following areas:
 - **West Anglia mainline four-tracking** - along the Lea Valley between at least Tottenham Hale and Broxbourne. However, Essex County Council supports the view of Harlow District Council that a feasibility study is required to explore the option of extending Crossrail 2 and 4-tracking to Harlow Town station. Overall Harlow has an increasingly important economy, with the success of their Enterprise Zone, and the relocation of Public Health England. At the same time the town has major ambitions around housing growth, which will support growth locally and within the London labour market. Harlow Town station also has existing and capacity for further stabling for trains. Four-tracking would provide rail capacity to bring forward the delivery of 6,000 – 12,000 new homes and 2,000 – 5,000 additional jobs to support growth along the Lea Valley and wider London Stansted Cambridge corridor and, to enable a London – Stansted journey time of 30mins.
 - **A120 corridor dualling** – we ask HM Government to consider our specific proposals on dualling the remaining sections of the A120 between Braintree – A12 and Hare Green to Harwich; the ports and logistics sector in this corridor has a turnover of £3bn per annum and employs over 32,000 people. With investment, the economy could grow by £1.3bn.
 - **Capacity improvements to M11 J8** – the junction is already at capacity and improvements would support growth at Stansted airport, unlock opportunities for local housing growth and improve connectivity between London, Stansted and Cambridge.
 - **Creation of M11 J7a** – to provide stronger links between London and Stansted airport and between the capital and the economic opportunities that exist within the Harlow Enterprise Zone.
 - **Upgrading of the M11 north of the airport between J8 – J9** – to provide stronger and more efficient links between Stansted airport, and the economic opportunities between London, Stansted and Cambridge.

- **A127 improvements** – the A127 has significant capacity and reliability issues, as highlighted in the Inner Thames Estuary [ITE] Study on Surface access, and flows which need to be addressed if it is to maintain current jobs and aid the delivery of new jobs and housing growth along the corridor. The A127 carries in excess of 70,000 vehicles per day which exceed those on many urban motorways elsewhere in the UK.

12. We are pleased that the importance of infrastructure is being considered by the Commission. Our evidence shows that there are already examples of ambitious projects based on robust understanding of local needs and that demonstrate joint working across a range of partners.

Cllr Rodney Bass
Cabinet Member for Infrastructure

Cllr Kevin Bentley
Cabinet Member for Economic Growth

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

- 1.1 Covering an area more than twice the size of Greater London, Essex has diverse strengths and is positioned to exploit an equally diverse range of opportunities. The county provides an excellent location for connecting businesses to centres of economic opportunity, including London, and internationally via the London Gateway and Harwich ports, and Stansted and Southend Airports.
- 1.2 Being so well located means that Essex is a significant contributor to growth; currently it supports 677,750 jobs; some 76,750 businesses. In 2013, Essex's businesses generated Gross Value Added (GVA) of £32.5 billion.
- 1.3 The commuting relationship between Essex and London is reciprocal; each year 149,000 Essex residents commute into London which approximates to £10.4bn GVA whilst 38,800 London residents commute to Essex which approximates to £2.7bn GVA per year¹.
- 1.4 By 2021 we are planning for over 117,745 new jobs; and over 81,310 new homes. Independent projections suggest that Essex will experience substantial demographic growth between 2014 and 2021. Analysis of 2013-based forecasts from the East of England forecasting model for the period 2014-21, suggest that Essex can expect to see growth in:
 - overall population of around 71,000 (4.9%);
 - the working age-population of 13,000 (1.4%); and
 - the number of households of some 33,000 (5.5%).
- 1.5 This amount of growth will exert pressures on our infrastructure, not only transport but education, health and social care and digital connectivity.
- 1.6 Due to the inter-connected relationship between Essex and its neighbouring counties and London growth in these areas will also affect our economy. For example the Upper Lea Valley is forecasted to generate 15,000 jobs and 20,000 new homes by 2021² whilst London Riverside is forecast to generate 16,000 jobs and 26,500 new homes.³
- 1.7 To keep businesses and commuters moving between Essex, London and beyond and ensure strong economic growth significant infrastructure investment is required:
 - improvements to surface access at Stansted airport – would enable the airport to grow its capacity;
 - the Lower Thames Crossing – would relieve congestion and speed up logistics;
 - a comprehensive solution to the lack of capacity at Junction 30/31 of the M25;
 - corridor improvements on the A12, A120 and M11 (including Junction 7a) – to connect centres of economic opportunity;

¹ Regeneris (2015) *Greater Essex External Economies Commission – Economic Linkages*

² City in the East

³ City in the East

- capacity improvements and integrated transport initiatives on the Great Eastern Mainline (GEML), West Anglia Mainline (WAML) (including 4 tracking) and opportunities offered by Crossrail 2 – to improve commuting and reduce journey times to London Stansted and London Southend airports and;
- investment in the London Underground Central Line and rolling stock, including station travel planning and interchange enhancements at Epping, Loughton, Buckhurst Hill, Chigwell and Roding Valley Stations – to improve commuting and support the night-time economy.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

- **How should they be prioritised, taking account of their response to London’s strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?**
- **What might their potential impact be on employment, productivity and housing supply in London and the southeast?**

2.1 We believe that future investment in large-scale transport infrastructure improvements in Essex will support growth in London and across the South East.

2.2 Essex County Council has identified four growth corridors where investment could help stimulate and support growth:

- London Stansted Cambridge Corridor (M11 and West Anglia Mainline)
- Haven Gateway (A120)
- Heart of Essex (A12 and Great Eastern Mainline)
- Thames Gateway South Essex (A127, A13 and Essex Thameside Mainline)

London Stansted Cambridge Corridor (M11 and West Anglia Mainline)

2.3 The west of Essex is part of the London-Stansted-Cambridge Corridor (LSCC), connecting London, Stansted and Cambridge, via the M11 and the West Anglia Main Line (WAML). The Corridor has enormous growth potential, particularly in Harlow, building on the local strengths in life sciences and other high value sectors for example Public Health England is moving its headquarters to Harlow.

2.4 London Stansted is the only airport in the South East with immediate capacity for significant growth. With a current planning application to support 35m passengers per year (up from 20m currently), there is capacity to increase this to 45m passengers per year by 2030. This could create an **extra 10,000 jobs** and **£4.6bn in additional economic activity**.

2.5 London Stansted airport is already successful in the leisure and tourism but future plans focus on attracting more business customers and increasing the number of long haul flights. The growth of both of these areas could provide a catalyst for growth across the East of

England, attracting inward investment and supporting key sectors such as life sciences (amongst others).

- 2.6 London Stansted is also a key handler of freight, handling 220,000 tonnes last year (the third biggest after Heathrow and the East Midlands) and there is potential with surface access improvements to grow this market as well.
- 2.7 Surface access improvements are critical to growth at Stansted Airport. The Airport will not be able to realise its true potential without investment in the following:
- M11 improvements focusing on junctions 7 and 8
 - A120 improvements, improving connections between the Haven Ports and the Airport
 - Four-tracking of the West Anglia Mainline, which will result in faster journey times from London
- 2.8 The Harlow Enterprise Zone provides a focal point for key sectors of significance to the UK and sub-regional economy including life sciences, advanced manufacturing and ICT with the potential to deliver over 51 hectares of employment land. Delivery has the potential to create over **5,000 jobs** and lever in over **£150 million in private sector investment**.
- 2.9 Improvements to M11 J7 and delivery of M11 J7a are required to realise the site's full potential.
- 2.10 It is hoped that Crossrail 2 will bring the desperately required four-tracking of the West Anglia Mainline to the London Stansted Cambridge Corridor and this should be prioritised.

Haven Gateway (A120)

- 2.11 The Haven Gateway Growth Corridor includes the districts of Braintree, Colchester and Tendring, and links Harwich International Port in the east to Stansted Airport and the M11 in the west via the A120. It is one of the key international gateways to the UK; home to Harwich International Port, one of the UK's leading multi-purpose freight and passenger ports, and supporting the neighbouring port of Felixstowe.
- 2.12 There is significant potential for growth at Harwich Port. Harwich has the potential to make a significant contribution to the offshore energy sector and is already supporting over 260 turbines, more than any other UK North Sea Port. It is well located at the centre of Europe's offshore wind activity and provides the sheltered conditions to support the growth of the offshore renewable sector. Harwich has recently been designated as a Centre for Offshore Renewable Engineering (CORE). This will provide additional support for businesses looking to invest in manufacturing for the offshore renewable energy industry, helping this sector to grow.
- 2.13 In the longer term, Bathside Bay has the potential to create a deep sea container port with road and rail links to the rest of the country. Around 101h additional land adjacent to Harwich Port is available which could attract **£300 million investment** and create at least **500 direct jobs** and many more indirect employment opportunities.

- 2.14 The **A120** links London Stansted Airport with Harwich International port and the local economies of Braintree and Colchester. Improvements along this route has significant potential to secure employment and housing growth along this corridor. It will connect the local workforce to two key international gateways and drivers of growth for Essex. Without the required improvements to the A120, the region will lose out on £1.3bn in growth and nearly 13,000 new jobs.
- 2.15 ECC is leading on the design and preparatory work for improvements to the A120, however firm commitment from Government to fund the scheme is required to ensure success.

Heart of Essex (A12 and Great Eastern Mainline)

- 2.16 The Heart of Essex growth corridor runs through the centre of Essex, linking London to the Haven ports, and onwards to Norfolk and Suffolk. The A12 and the Great Eastern Main Line (GEML) rail services link the key urban centres of Brentwood, Chelmsford, Colchester and Maldon to London.
- 2.17 The corridor has strong links with the London labour market, supporting substantial commuter flows to and from the capital. These links will grow and strengthen as Crossrail is completed, when new services will stop at Brentwood and Shenfield, both of which will benefit from planned improvement works to facilitate these new services
- 2.18 Additional investment in rail and road infrastructure is essential for unlocking the full economic potential of the Corridor, and a package of investment is proposed to address bottlenecks on the A12 to support growth.

Thames Gateway South Essex (A127, A13 and Essex Thameside Mainline)

- 2.19 The districts of Basildon, Castle Point and Rochford, along with the unitary authorities of Thurrock and Southend, form Thames Gateway South Essex (TGSE); part of Thames Gateway, the largest regeneration opportunity in Europe. Along this corridor the A13 links the key port infrastructure of Tilbury and London Gateway with London, while the A127 corridor connects the capital to the manufacturing hub of Basildon, and to Rochford, Southend, London Southend Airport and surrounding employment areas. Improvements to the road network in this area are vital to securing growth and inward investment.
- 2.20 London Gateway is the UK's first major deep sea container port and Europe's largest logistics park. It will provide access to the largest consumer markets in the UK and internationally. A significant port development for the UK, it occupies a 1,500 acre site and will provide 2,700 metres of quay and six deep water berths. The logistics park could provide nearly 1 million m² of accommodation. Together the development has the potential to create more than 12,000 direct, permanent jobs and more than 20,000 indirect jobs. The site is supported by the country's largest Local Development Order, developed by Thurrock Council to give confidence to occupiers to invest.

- 2.21 Port of Tilbury is one of the largest deep water ports on the River Thames and is the UK' leading port for forestry products with excellent links throughout the supply chain including shipping lines, importers, merchants and distributors. Work is currently underway to develop more than 940,000 sq. ft. of new high quality distribution facilities and 17 acres of haulage facilities adjacent to the port of Tilbury. The London Distribution Park development is expected to generate up to 1100 jobs and secure the long term prosperity of the port.
- 2.22 London Southend Airport has been one of Europe's fastest growing airports in recent years with over 1 million passengers in 2014. It has received over £130 million of investment since it opened in 2008, mainly from the private sector. A Joint Area Action Plan (JAAP) sets out detailed proposals for the development of London Southend Airport and the surrounding area. The Airport itself has capacity to support up to 5 million passengers per annum and 2 million by 2030. By 2021 it is expected that the airport will support an additional 2,000 jobs.
- 2.23 There is significant potential for growth, not only at the airport site but in areas surrounding this key hub. The Airport Business Park (ABP) to the North West of the Airport will create a million sqft of high quality employment space and over **6,000 jobs**. The proposals include a site for the Anglia Ruskin Medtech campus, which will create space and support for businesses in the medical technologies sector.
- 2.24 Currently, development is constrained by the limited capacity of the strategic road network, particularly J30/31 of the M25 and the dual carriageway stretch of the A13. The A127 also carries a volume of traffic comparable to a motorway in other parts of the country and has significant capacity issues which need to be addressed, particularly around Basildon, London Southend Airport and the Southend Central Area. Southend Borough Council and Essex County Council have developed a joint "A127 Corridor for Growth" economic plan to identify, plan and coordinate investment decisions and manage the asset.
- 2.25 The **A127** corridor which connects Basildon with Southend is vital to the economic competitiveness of the Thames Gateway South Essex sub-region and indeed to the economy of the County of Essex and beyond. It is located in the heart of the Thames Gateway which has been identified as being of national significance. Thames Gateway South Essex has an ambitious growth agenda to build on existing strengths and make the most of a unique combination of opportunities. Investment to improve capacity and flows along the A127 is therefore required to secure jobs and housing growth.
- 2.26 Bordering London to the west, the **A13 corridor** links the key port infrastructure of Tilbury and London Gateway with the capital. The corridor provides a significant growth opportunity and already benefits from major planned and committed private investments such as London Gateway (£1.5bn), Thames Enterprise Park (£1bn), Lakeside (£1bn), Purfleet (£600m) and Canvey Gateway (£110m). With the right investment, the A13 corridor will deliver 4,150 homes and 11,000 jobs by 2021. However, the road is currently constrained by its capacity. To unlock this growth potential, local authorities will invest £300m, however additional funding is required (in the region of £87 million).

2.27 Furthermore, the potential impact of the Lower Thames River crossing would be significant on transport routes in this corridor, with one of the two short-listed options being to connect the M2 in Kent with the A13 and the M25 between junctions 29 and 30.

2.28 In summary our priorities for investment are:

- **A127 improvements** – the A127 has significant capacity and reliability issues, as highlighted in the Inner Thames Estuary [ITE] Study on Surface access, and flows which need to be addressed if it is to maintain current jobs and aid the delivery of new jobs and housing growth along the corridor. The A127 carries in excess of 70,000 vehicles per day which exceed those on many urban motorways elsewhere in the UK.
- **Lower Thames Crossing** – another crossing is required to ease congestion across the Queen Elizabeth II Bridge and provide resilience in the area.
- **A120 corridor dualling** – we ask HM Government to consider our specific proposals on dualling the remaining sections of the A120 between Braintree – A12 and Hare Green to Harwich; the ports and logistics sector in this corridor has a turnover of £3bn per annum and employs over 32,000 people. With investment, the economy could grow by £1.3bn.
- **A12** – we are working closely with Highways England to design the improvement schemes announced in the 2014 Autumn Statement.
- **Creation of M11 J7a** – to provide stronger links between Stansted airport and the economic opportunities that exist for Growth within the Harlow Enterprise Zone.
- **Capacity improvements to M11 J8** – improvements on this already at capacity junction would support growth to Stansted airport as well as providing opportunities for housing growth locally.
- **Upgrading of the M11 north of the airport between J8 – J9** – to provide stronger and more efficient links between Stansted airport, and the economic opportunities that exist for Growth within the Harlow Enterprise Zone, Cambridge and wider region.
- **West Anglia mainline four-tracking** - along the Lea Valley between Tottenham Hale and Harlow to provide rail capacity to bring forward the delivery of 6,000 – 12,000 new homes and 2,000 – 5,000 additional jobs to support growth along the Lea Valley and wider London Stansted Cambridge corridor and, to enable a London – Stansted journey time of 30mins.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

3.1 We believe that delivering four-tracking of WAML outside of the Crossrail 2 programme would lead to an increase in benefits as commuters and airport passengers could travel more easily and reliably to and from the capital.

3.2 Further, there is potential to reduce costs by undertaking a scoping study into extending four-tracking and Crossrail 2 services to Harlow Town Station where there are marshalling and servicing facilities for trains already present that TfL could use.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

- **What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?**
- **What innovative funding mechanisms could be considered to support delivery of key schemes?**

4.1 We have a strong track record in forward funding and part funding large scale infrastructure projects and would be happy to share this knowledge and experience with the Commission.

4.2 As well as leveraging investment from local authorities, businesses, developers and (in the case of rail) operators we see no reason why additional taxation (enabled by Business Rate Legislation) could not be used to part fund significant infrastructure projects such as Crossrail 2 or a new Lower Thames Crossing. This has already been successfully applied for the funding of Crossrail and the London Olympics.

4.3 There is a robust evidence base to support the use of user charging to recoup the construction costs and pay for ongoing maintenance of road and river crossing infrastructure projects. This approach should not be discounted.

National Infrastructure Commission – Call for Evidence

Subject: London’s Transport Infrastructure – **Connecting East London – Low Level River Crossings**
To: National Infrastructure Commission (londonevidence@Infrastructure-Commission.gsi.gov.uk)
Prepared by: Farrells and BuroHappold Engineering
Date: January 7th, 2016

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

London’s population growth has accelerated to an extent much greater than anticipated, to a Victorian rate of change. A year ago, London’s population surpassed its 1939 peak of 8.6 million and latest predictions foresee London’s population exceeding 10 million by 2035. This creates opportunities, but also brings with it major challenges. London is one of the most thriving and growing urban economies. It is a centre for innovation, creativity, and culture. In order to remain the global city London is today and to lead the world in sustainable, resilient urban growth, London however needs to address its ***most pressing challenges: Housing and infrastructure provision for a growing population and economy, social and economic inequality, and the impacts of climate change.***

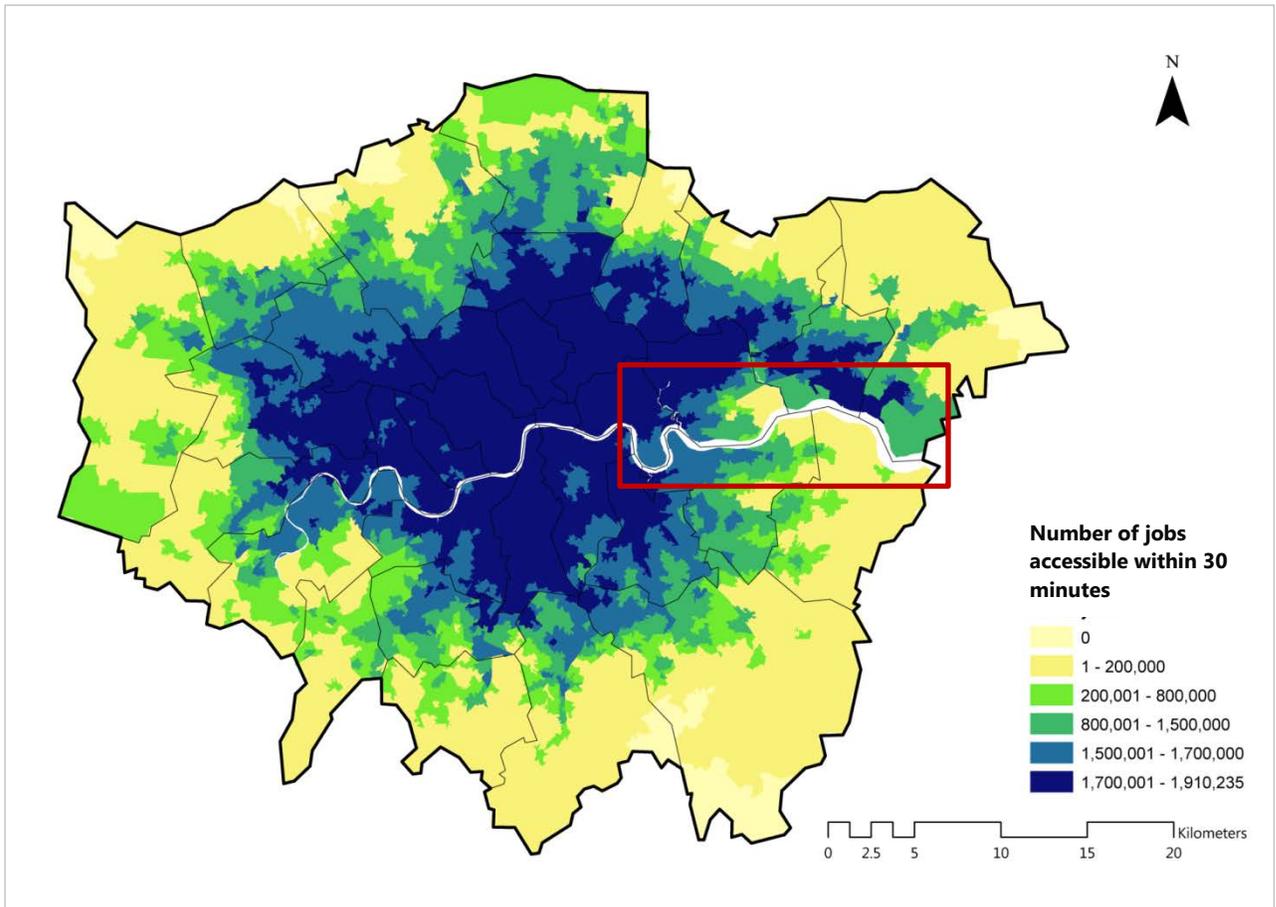
Providing ***housing*** for those already in London and its future population growth is one of the key challenges that London faces today. Official estimates assume the need to build almost 50,000 homes a year over the next twenty years, supply levels far beyond those currently achieved. With local authorities reducing or abandoning their housebuilding activities since the early 1990s, the private sector and housing associations have not managed to build more than 20,000 units per year on average. Moreover, London needs to provide these ***homes for all income levels***. Around 70% of all homes need to be affordable – social rented housing, intermediate housing, and housing in the lowest market band – according to estimates. London has only managed to build around 2,000 homes for social and affordable rent per year since 2008.

Solving the housing crisis is as much about new housing policy, innovative financing and governance mechanisms, and technical innovation as it is about ***spatial planning and unlocking land for development***. The GLA and TfL have responded to this with bold infrastructure projects, from the London Overground to Crossrail; and there are further ambitious plans (e.g., Crossrail 2) to increase accessibility of underserved areas in London. This will support both employment creation and home building at increased density. However, more needs to be done, across London

In recent times it has become clear that only **East London** has the spatial capacity and ability to accommodate growth on a larger scale. Shoreditch and Hackney have become desirable places to live and work whilst Canary Wharf has become a major finance centre with a mix of shops, homes, and a cultural offer with superb connectivity. The London Olympics Legacy has helped support growth in Tower Hamlets and Newham and the Royal Docks is at last attracting sustained investment. However, large areas of East London have seen little or no growth. A lack of transport accessibility (see Figure 1) has held back housing delivery in

East London and too much has consisted of low-density sprawl in featureless dormitory suburbs. While the London Plan identifies East London as the area with the greatest potential for growth (40% of the opportunity areas), it will be hugely challenging to find investors if land is not unlocked by making it more accessible to employment throughout London and the south east.

Figure 1: Accessibility to jobs



2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

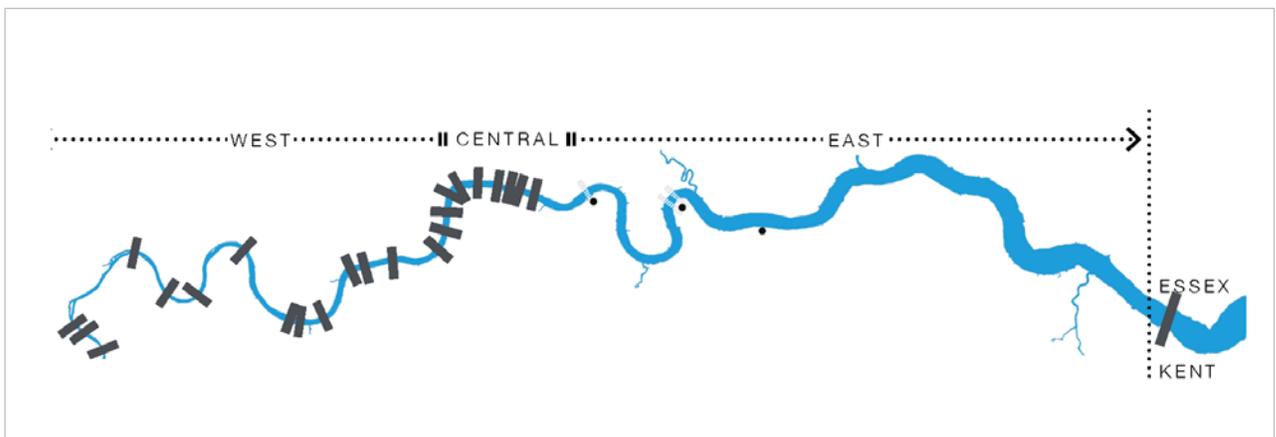
To address the challenges outlined above, **new river crossings in East London** should be part of any future investment in infrastructure improvements. TfL has started investigating different options and is preparing for the planning and construction of strategic through traffic crossings such as the Silvertown Tunnel, a crossing at Gallions Reach, and one at Belvedere. While necessary, these crossings will however not be sufficient to address the local accessibility needs of local communities that are being planned and built in East London. Moreover, these crossings – currently conceptualized as tunnels and high-level bridges – will sterilize large areas of land on either side of the river due to their long approach ramps, often stretching a mile back from

the river bank. Future investment in transport infrastructure therefore needs to include the building of **low-level bridges and other local crossings such as high frequency ferry services in East London**, enabling walking and cycling and conveniently connecting people to transport nodes on either side of the river – effectively extending the network of transport connections to the river.

Historically, West London grew and flourished because areas north and south of the river were connected by bridges, improving connectivity and unlocking new land for development. To provide one example: In 1842, the Commission of Woods, Forests, and Land Revenues recommended “the building of an embankment at Chelsea to free new land for development, and proposed the building of a new bridge downstream of Battersea Bridge” (Roberts, C. 2005. Cross River Traffic. London: Granta, p. 130).

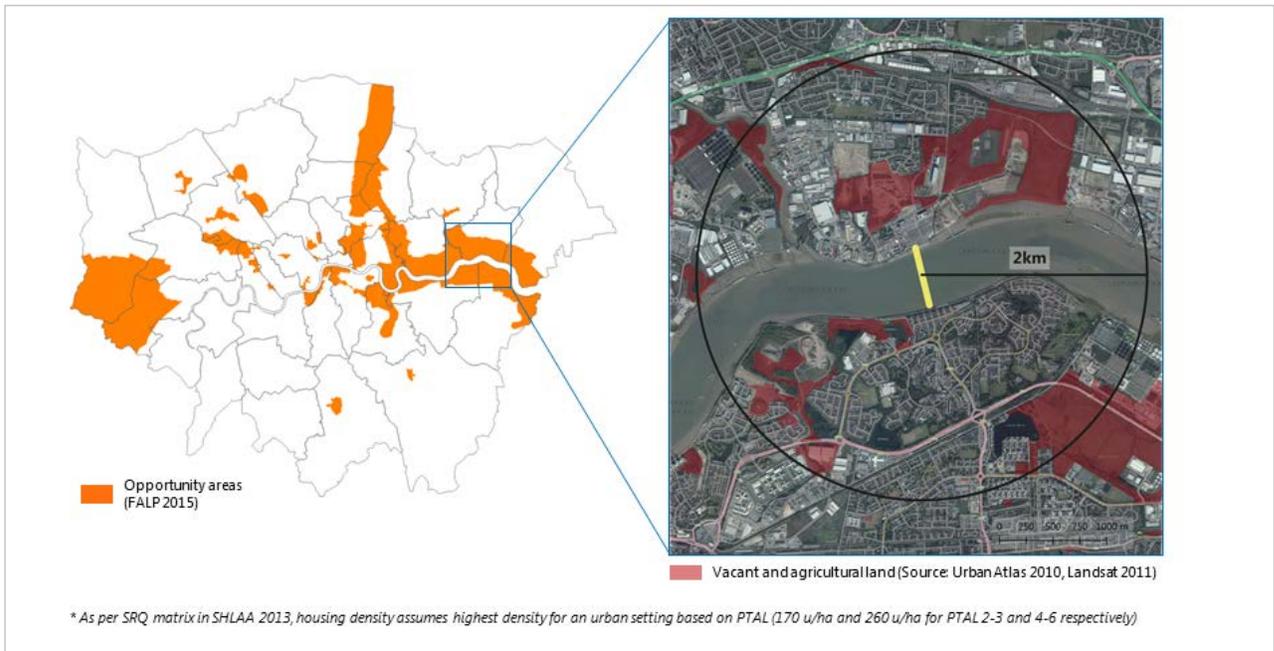
Currently, there are 34 bridges across the Thames, but **only one bridge east of Tower Bridge** – the high-level bridge at Dartford (see Figure 1).

Figure 2: Bridges across the river Thames



Building local crossings will help unlock land for housing development and improve job accessibility for existing and future communities. Analysis suggests that within a 2km radius of a potential bridge connecting Thamesmead with Barking Riverside, almost 50,000 new homes could be built (see Figure 3) – this is one year of the housing supply currently required for London’s growth. A bus connection over the bridge that would link Abbey Wood Crossrail station in the south with the future Barking Riverside Overground station in the north would increase job accessibility for existing and future communities in the area.

Figure 3: Housing capacity in Thamesmead / Barking Riverside



Low-level bridges will allow private and public developers to take advantage of increases in land value to **create vibrant urban communities** along the river front and further inland. It will re-connect settlements on the North and South banks with the Thames and **enhance the East London riverfront** through landscape restoration and the animation of the waterfront with shops, cafes, and public spaces for people to linger, walk, and enjoy. This addresses one of the key goals in the current Port of London Authority Vision (i.e., "Riverside as a magnet for ramblers, historians, artists, and others", PLA Thames Vision Consultation on Goals and Priority Actions, Dec 2015).

Low-level bridges will also help **reduce pressure on over-burdened parts of the transport network** by **providing sustainable alternative modes of transport**. With the development under way in North Greenwich and the Royal Docks, a low-level bridge could increase crossing capacity. TfL's *River Crossings: East of Silvertown Crossings* (Jul 2014) report demonstrates the need to increase capacity of the Woolwich Ferry crossing. It also shows that this crossing is mainly used by people originating in the boroughs north and south of the river. A low-level bridge will reduce the pressure on the Woolwich Ferry. It will also help achieve TfL's goal of reducing dependence on road-based transport and improve air quality. The same report indicates that road-based travel in East London is the main transport mode in connecting people to employment. Low-level crossings will improve the infrastructure for alternative modes of transport such as walking and cycling.

We are fully aware of the **challenges that low-level bridges pose to river traffic**. The River Thames poses several constraints due to its topography and its tidal nature. It requires highly experienced pilots to manoeuvre ships and the more obstacles in the river, the more difficult it becomes to manoeuvre. We are also aware of the cultural, environmental, and economic importance of the river traffic. In 2014, the port handled 44.5 million tonnes of goods and materials and provided direct employment for 27,000 people. 5.5 million goods and materials were moved between the wharves on the river, taking 550,000 lorry trips off the region's road (PLA Thames Vision Consultation on Goals and Priority Actions, Dec 2015). This reduces congestion on London roads, increases road safety, reduces greenhouse gas emissions, and improves air quality.

Taking these challenges into account, we however strongly believe that by exploiting today's smart traffic systems and the variety of designs for opening bridges, **both interests can be served; creating vibrant communities in East London while achieving PLA's goal of being the busiest ever Port of London.** Examples of other cities might be able to teach us something (see section 5 below).

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

Low-level bridges **can be more affordable** than high-level bridges and tunnels. Rough costing of a potential bridge between Thamesmead and Barking Riverside allowing for cycling lanes, walking space, and a one-way bus lane supported by sensors and lights showed that bridge construction between banks could be under £150 million – about fifty percent less than a high-level bridge (this does not include additional costs beyond the banks with approach works and ramps). This would potentially also be cheaper than TfL's idea of an Overground tunnel extension from Barking Riverside to Thamesmead (TfL, *New river crossings for London*, Dec 2015). A more detailed analysis and costing would of course have to be undertaken in order to move forward.

One of the fundamental principles that should govern infrastructure funding is that those that benefit most, should help pay for it. In regards to a low-level bridge, this **benefactor-pays** principle can be achieved through tolls by those using the bridge (especially if vehicles are allowed), land value capture mechanisms whereby land owners and developers are charged a fee as they are benefiting from increasing property values, or through business rates whereas businesses that profit from increased economic activity are charged a fee. The appropriateness of each of these financing mechanisms depends on the users the bridge serves (e.g., public transport, private vehicles) and the location (e.g., it might be easier to get funding from developers in locations where investment interest is already existent than in locations where land still needs to be unlocked).

There is also a **rationale for public investment** as the socio-economic benefits of regeneration in a traditionally deprived and underserved area as well as the opportunity to unlock land for much needed housing largely outweigh the costs involved. Contributions from national government and the GLA would demonstrate their commitment to a more balanced growth in London. Boroughs could make contributions as they will benefit from tax revenue growth from increased economic activity and population growth.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

While we appreciate that each city deals with different opportunities and challenges and each river has different physical constraints, there are examples that show how local bridges can improve accessibility and unlock development and how the technology of opening-bridges can work in other cities.

Baakenhafen Bridge, Hamburg

The Baakenhafen bridge in Hamburg is a local vehicle, pedestrian, and cycling bridge that connects two areas of the new district Hafencity and greatly increases accessibility to Hamburg's inner city. The construction of the bridge allowed for the development of 1,800 housing units, shops, offices, and community spaces. Without the bridge, development would have been much harder to achieve.

Ponte della Musica, Rome

The Ponte della Musica crosses the river Tiber in Rome and connects the former Olympic stadium on the west bank of the river with the Quartiere Flaminio for the first time in a 1,000 years. The bridge was designed to

serve as an open public space that can be used for festivals, exhibitions and fairs. It also has the facility to operate as a tram and bus route. It connects Rome's most significant cultural institutions and provides ease of access for residents to enjoy these institutions fully.

The New Botlek Bridge, Rotterdam

The new Botlek bridge across the Oude Maas in Rotterdam is an example of advanced bridge technology. It is one of the largest moveable bridges in the world. The bridge will be opened around once every hour, or 9,000 times per year and only 120 seconds are required for the entire opening or closing procedure. The bridge will remove a bottleneck for ships, caused by the existing low and narrow moveable bridge's limited navigation clearance while also improving the flow of road traffic.

Kattwyk Bridge, Hamburg

The Kattwyk bridge across the South Elbe in Hamburg is an opening bridge across a tidal and curvy river that opens during the day every two hours for river traffic. Built back in the 1970s, the opening mechanisms is not as fast as the new Botlek bridge and disrupts vehicle traffic across the river for about 15-20 minutes each time.

January 2016

Dear Sir/Madam,

National Infrastructure Commission: Call for Inputs

FSB welcomes the opportunity to respond to the above named consultation.

The FSB is the UK's leading business organisation. It exists to protect and promote the interests of the self-employed and all those who run their own business. The FSB is non-party political, and with around 200,000 members, it is also the largest organisation representing small and medium sized businesses in the UK.

Small and medium-sized businesses make up 99.9 per cent of all businesses in the UK, and make a huge contribution to the UK economy. They account for 47 per cent of private sector turnover and employ 60 per cent of the private sector workforce.

Transport infrastructure is vitally important to small businesses across the country. Small business owners in the North, London and across the UK report a range of challenges they face which are hindering the economic development of their business. If the National Infrastructure Commission is able to improve the planning and delivery of major infrastructure projects, small businesses will have greater opportunities to expand and compete internationally.

We trust that you will find our comments helpful and that they will be taken into consideration.

Yours sincerely,



Mike Cherry, Policy Director, AIMMM FRSA

FSB

FSB response to the National Infrastructure Commission: Call For Inputs

January 2016

The evidence submitted to this call for inputs is primarily based on surveys carried out on a survey panel of our members. The FSB Big Voice survey panel is made up of nearly 6000 small business owners, who are regularly surveyed on a range of different policy issues. This survey panel is broadly representative of the wider small business community. Surveys are administered by an independent research agency which is a signatory of the Market Research Society's Code of Conduct.

FSB also receives views from our members via a federated regional structure which allows small business owners across the country to raise areas of concern to them at a national level. For the purposes of responding to this call for inputs, we spoke to representatives of the FSB in regions across the North and in London, in order to ensure we accurately represented the views of small business owners.

CONNECTING NORTHERN CITIES

1. To what extent are weaknesses in transport connectivity holding back northern city regions (specifically in terms of jobs, enterprise creation and growth, and housing)?

Improving the transport connections in the North is a top priority for FSB. Weakness in transport connectivity is holding back growth among small businesses in northern city regions.

The agglomeration benefits which firms in London and the South East derive from a generally strong transport infrastructure are not delivered for smaller businesses across the North. This makes it increasingly difficult for smaller businesses in the North to compete. Without further investment in transport infrastructure to bring Northern regions together, it will remain challenging for smaller businesses to develop in the North.

The APPG on Small Businesses – supported by FSB - published a report into the drivers of productivity in March 2015. This inquiry took evidence from a range of different stakeholders, finding that a lack of transport connectivity hindered productivity levels in different regions.¹

We would highlight the wide discrepancies in per capita infrastructure spending between the North and other regions of the UK which have been found by IPPR North.² This points to a broader issue with historic levels of under-investment in northern infrastructure having left the region relatively underdeveloped and with poor intra-regional connectivity.

Small business owners have also pointed to a lack of transport infrastructure as holding back their ability to connect with suppliers, customers and employees, particularly in rural areas. The declining quality of public transport and generally poor upkeep of the minor road network

¹ APPG on Small Businesses Report on Productivity: Available at http://www.millionplus.ac.uk/documents/All_Party_Parliamentary_Small_Business_Group_Productivity_and_Small_Firms_productivity_report.PDF

² IPPR North, Transformational Infrastructure for the North, August 2014

has meant that rural small businesses can struggle to compete against national and international competitors which have access to superior transport networks.

We would therefore urge the Commission to not just focus on urban and city to city transport infrastructure, but also to consider travel to work routes between cities and the rural hinterlands where many small businesses, their customers and their employees are based.

2. What cost-effective infrastructure investments in city-to-city connectivity could address these weaknesses? We are interested in all modes of transport.

In a recent survey, FSB asked small business owners what modes of transport were of importance to their business. The results were as follows:

Table One: How important are the following modes of transport to your business?³

	Car	Van	Lorry	Bus	Train	Walking	Cycling
Important	93%	64%	49%	32%	33%	39%	22%
Unimportant	2%	12%	20%	27%	28%	24%	32%

We also asked how important road access was to their business, and how important the public transport network was to their business.

Table Two: How important is the road network / public transport access to your business?⁴

	Road network	Public transport
Important	88%	36%
Unimportant	3%	30%

It is clear that the vast majority of small businesses still rely heavily on the road network for their cars, vans and lorries. This is reflected in the high importance attributed to both the road network and for private car, van and lorry use.

However, public transport is important to a significant percentage of small business owners, where over a third still place value on access to public transport. Close on half of businesses in urban areas (48%) were likely to view public transport as being important, reflecting the benefits that a well functioning urban public transport network can provide.

³ FSB Big Voice survey, Rural Transport, September 2015. Base 1352 responses

⁴ FSB Big Voice survey, Rural Transport, September 2015. Base 1352 responses

For reference, and outside the scope of this section of the call for inputs, 65 per cent of London based businesses value the public transport network, providing further evidence that where public transport works, it provides an important service for small businesses.

Investment in the road network is therefore the most important priority for small business owners. This should not simply reflect investment in the Strategic Road Network or city to city links, but should also include the minor roads which form a key part of the door to door journey for small business owners, their suppliers and their employees.

We also note that many inter-city rail connections continue to rely on old rolling stock and carriages which can hinder capacity. Making additional investment in upgrading the rolling stock used on these routes could be more effective in increasing capacity than making larger scale investments in new or upgraded routes.

3. Which city-to-city corridor(s) should be the priority for early phases of investment?

FSB has argued in previous submissions to the Chancellor that a new tunnelled, trans-Pennine road route between Manchester and Sheffield would provide an important new city-to-city corridor in the North.

Many small businesses are not however based in cities, and do not necessarily place high value on access to city-to-city corridors. Instead, they look to the transport network to connect rural and semi-urban areas to city and town centres.

There is widespread concern among small businesses that new devolution deals will primarily benefit cities rather than the rural hinterland. It is important that existing, and future, devolution deals include mechanisms to ensure that the needs of rural areas are also addressed.

Small business owners in the North East also raised concerns that the 'Northern Powerhouse' will be primarily focussed on the Manchester-Leeds corridor. In their view, this would be a mistake as much-needed investment in the North East, including around Newcastle, would be missed. East to West connectivity across transport modes is as important to increase agglomeration benefits as connections through to London are.

As a federated organisation, FSB has not taken a position on specific infrastructure projects or city to city corridors, as small business owners across the North have told us that the general state of poor transport infrastructure is hindering the growth and economic potential of their business.

4. What are the key international connectivity needs likely to be in the next 20-30 years in the north of England (with a focus on ports and airports)? What is the most effective way to meet these needs, and what constraints on delivery are anticipated?

The top priority for FSB in terms of international connectivity is to improve runway capacity in the South East. We recognise that this is a decision which has been specifically excluded

from the remit of the National Infrastructure Commission. Setting aside the question of overall aviation system capacity, it is clear that more should be done outside the South East to improve international connectivity.

Whilst aviation is a lower priority for small businesses compared to the road and rail network, some small businesses do see it as important. FSB asked small business owners about how important air travel was to their business in a 2013 survey.⁵

This survey found that 27 per cent of small businesses placed at least some importance on aviation for their businesses. This importance could reflect the importance of access to freight opportunities, but could also reflect the value that some sectors, such as the tourism industry, place on aviation access. Other small business owners, especially those who export, will also often need to fly in order to meet with potential or existing clients and suppliers. Therefore continued improvements to regional airports and the destinations they serve is important.

A key issue which has repeatedly been raised is delivering improvements to surface access connectivity to airports. For small business owners, the time taken to complete a door-to-door journey is critical. This means the length of time taken to access any given airport is given weight when deciding on which airport to travel from. Business owners were especially critical of the poor surface access to Leeds-Bradford airport, which was viewed as a particular impediment in choosing to fly from there. Drop off charges at this airport are also expensive, which increases the cost of flying from this airport. The Commission should look to prioritise improvements to surface access to regional airports across the North as a key way to incentivise further export growth.

Digital infrastructure plays a key role in developing international connectivity

Digital connectivity does not appear to be within the scope of the Commission at the current time. We view this as a mistake, as digital connectivity is now critical to allowing small businesses to trade overseas. FSB has published extensive research looking at the benefits of digital connectivity, along with the barriers stopping small businesses from doing more online.^{6,7} Ofcom have echoed our findings that a lack of digital infrastructure is a key barrier stopping small businesses from making full advantage of the benefits offered by using digital tools.

As a consequence, we believe the Commission should consider investigating the provision of digital infrastructure, particularly to small businesses, as a future priority.

5. What form of governance would most effectively deliver transformative infrastructure in the north, how should this be funded and by whom, including appropriate local contributions?

⁵ FSB The Voice of Small Business survey panel, Infrastructure Survey, April 2013

⁶ FSB, Reassured, optimised, transformed: driving digital demand, September 2015

⁷ FSB, The Fourth Utility, July 2014

One concern which has been raised following the creation of Transport for the North and the National Infrastructure Commission is the precise breakdown of roles and responsibilities for planning and delivering transport infrastructure in the North. The role of local councils, LEPs and combined authorities also may need clearer definition following these changes.

The failure of the Government to follow the recommendations of the Davies Commission on airport capacity raises broader issues about the effectiveness of a Commission-led model to deliver transformative infrastructure. If the Government is under no obligation to follow the recommendations of the National Infrastructure Commission, we are concerned that future Governments will simply erect barriers to avoid making a definitive judgement on any recommendations from this body. Without some form of safeguard such as a legal obligation to respond to recommendations within a certain timeframe we are unsure that the Commission will be effective.

Small business owners would like clarity over which body is best placed to address specific areas of concern aside from which body will be responsible for the delivery of transport infrastructure.

FSB has been generally supportive of the new devolution deals which are being created, and views the creation of strong combined authorities with the power and accountability to deliver local priorities as an important and welcome change.

However, one challenge for these new authorities will be the varying levels of power which has been devolved to them. For instance, in the transport space, some combined authorities have power over buses in their area, whereas others do not. As combined authorities proliferate, there is a risk that effective planning across regions may be hindered as different combined authorities have different powers to address different issues. This was viewed as a particular problem in the North East, where the lines of accountability and authority between national Government, combined authorities and Transport for the North were viewed as unclear.

A second challenge facing combined authorities is that stronger, more effective combined authorities will be better placed to compete for funding streams. While this makes sense from an accountability perspective, business owners are concerned that their region may miss out on investment opportunities if their combined authority consistently fails to put in competitive bids for funding. Regions or rural communities outside of combined authority areas similarly may be disadvantaged when competing for limited investment opportunities.

At the same time, we recognise that if a combined authority is able to make a strong case for investment in transport infrastructure in a particular region, this suggests they may be better positioned to effectively manage the delivery of infrastructure. The National Infrastructure Commission should play a role in ensuring that new projects are effectively prioritised to provide the greatest economic benefit to the country.

LONDON'S TRANSPORT INFRASTRUCTURE

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

FSB have published a London manifesto ahead of the 2016 Mayoral Election which sets out our policy priorities for the next London mayor.⁸ This manifesto highlights some of the challenges which small businesses in London are currently facing with regards to transport infrastructure.

Commercial and residential rents are increasing the pressure on the transport network

As commercial rents increase across London, we are concerned that small businesses will increasingly be priced out of prime locations, particularly those in central London. This will affect the ability of small businesses to access the economic benefits offered by being based in London.

Recent FSB surveys have also shown that there is considerable concern among small business owners about the cost of housing in the capital. 22 per cent of small businesses said that the cost of housing had negatively impacted their business over the past four years; 13 per cent said high housing costs had impacted their ability to retain staff and 7 per cent said it had affected their level of productivity.

Permitted developments rights, which have been encouraging the change in use for commercial buildings to residential properties will only serve to exacerbate the issue.

Assuming that house prices continue to push Londoners further away from the main areas of employment, small businesses will rely even more heavily on a robust, effective and integrated transport system to carry commuters to their places of work.

Capacity on London public transport is also becoming a constraint on growth opportunities

As London's population increases, capacity on the London transport network will similarly become increasingly constrained. This again will have a detrimental effect on the ability of small business employees to travel to and from work.

Public transport is very important to London-based small businesses, as this is a key way for customers, suppliers and employees to access business premises. Owing to London's dense public transport system, small business owners were significantly more likely to view public transport as more important to their business compared to business owners in the rest of the country.

⁸ FSB London manifesto, November 2015. Available at [HTTP://WWW.FSB.ORG.UK/DOCS/DEFAULT-SOURCE/FSB-ORG-UK/FSB_A4_LONDON_MAYOR_MANIFESTO.PDF?SFVRSN=0](http://www.fsb.org.uk/docs/default-source/fsb-org-uk/fsb_A4_LONDON_MAYOR_MANIFESTO.PDF?SFVRSN=0)

Table Three: How important is public transport to your business?

	London	UK
Important	65%	36%
Unimportant	17%	30%

44 per cent of small business owners in London viewed public transport access as 'very important' to their business, compared to just 14 per cent of small business owners nationwide.

Small business owners with businesses in London raised different issues when asked to select three top issues affecting their use of the road network when compared to business owners in other parts of the country.

Table Four: What are the top issues in the road network affecting your business? (three selected from list)

	London	UK
Congestion on local roads	63%	45%
Parking availability	35%	22%
Congestion on motorways	30%	26%

Congestion and a lack of parking were therefore viewed as the two main issues affecting London based small businesses. These results are significantly different to the views expressed by small businesses based in other areas of the country, who were more likely to view potholes and frequent road works as the most significant issues.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

- **How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?**
- **What might their potential impact be on employment, productivity and housing supply in London and the southeast?**

The successful delivery of Crossrail 2 represents the main priority for FSB in terms of improving London transport. Funding for this project should primarily come from the private sector. Where public financing is necessary in the form of Business Rates Supplements, we

would like thresholds, similar to those put in place for the Crossrail I project, in order to exempt the smallest businesses from paying a supplementary charge.

More generally, FSB believes that the ability to raise business rates to pay for infrastructure projects should be contingent on the support of the wider small business community. A similar process to the adopted within the Business Rates Supplements Act 2009 should be considered for infrastructure financing.

For further information

Will Black
[email redacted]
Federation of Small Businesses
2 Catherine Place, London SW1E 6HF

Freight on Rail response to Call for Evidence to National Infrastructure Commission:

This is the Freight on Rail response to the National Infrastructure Commission (NIC) call for evidence on the terms of reference listed.

Freight on Rail, a partnership of the rail freight industry, the transport trade unions and Campaign for Better Transport, works to promote the economic, social and environmental benefits of rail freight to local, devolved and central Government in the UK and to the European Commission, Parliament and Council of Ministers.

Summary

In addition to the terms of reference, covered in our sections A, B & C, we would like to make key general points, which are not only relevant to all three NIC terms of reference but also to the vast majority of NIC future infrastructure schemes.

NIC needs to take into account the socio-economic benefits of rail compared to HGVs which impose high external costs on society which are not internalised. Government policy, as a whole including the NIC, should set equitable transport policy across the modes which takes into account these market distortions. (See section 6)

Our response is comprised of key general points with headings below, explained in detail in sections 1-7 followed by our response to your terms of reference in sections AB & C.

The general points are covered under the following headings below:-

Growth of rail freight and its importance to UK PLC

Infrastructure Commission should make using rail a planning condition

Road and rail complement each other as part of the logistics solution

Rail's role in delivering to cities and transhipping to last mile low emissions deliveries

Land use planning

Lack of a level playing field between modes

Upgrading key rail routes can significantly reduce road congestion on key strategic corridors

1. The growth of rail freight and its importance to UK PLC

Both the Secretary of State for Transport, Patrick McLoughlin and the Rail Minister Claire Perry have voiced their support for rail freight. In June 2015 Claire Perry commented on *'the*

remarkable rise of rail freight' at the Rail Engineers Forum conference in June 2015. She highlighted rail freight's excellent record to date and its forecasted growth in two key market sectors saying that the Government wants to work with the rail freight industry to remove barriers that inhibit that growth.

On December 9th 2015, the Secretary of State endorsed her statement saying "*that the story of our modern rail industry is amazing and freight is a key part of that. We want rail freight to grow much further because demand to going to keep increasing*".

Consumer traffic has grown by 30% since 2006/7 and grew 5% in the last full year14/15.

Construction traffic increased by 17% in 2013/14 and 10% last year with 2.5 per annum growth forecasted. The decline of coal traffic has been largely anticipated and forecast although the scale of the decline was sharper than expected; coal traffic was down 61% in the first quarter of 2015/16. So the Government and devolved bodies need to work together with the industry to provide a network which can cater for more consumer rail traffic and construction traffic, both forecast to expand, to replace the coal traffic.

Industry Forecasts show intermodal rail traffic will quadruple by 2034

Consumer rail traffic is forecast to quadruple by 2034. Construction traffic 2.5% annum growth forecasted. But forecast are dependent on upgraded network and existing market conditions.

Retention of the mode shift benefit grants are important to overcome the lack of a level playing field between HGVs and rail. See section 6

2. **Infrastructure Commission should make using rail a planning condition** during construction phase of infrastructure projects for the delivery of raw materials and removal of spoil because of its lower external costs than road freight. The nearest railhead should be used whether building roads, rail, power stations or airports, using nearest railhead. The Olympics, Crossrail and Terminal 5 are good case studies of demonstrating the benefits of this approach.
3. **Road and rail complement each other as part of a logistics solution** by each playing to its strengths. As well as its bulk commodity markets, rail is well placed to offer the long-distance

trunk haulage for consumer traffic, as demonstrated its 30% growth since 2006/7 and its sustained 33% market share for the past few years, including in 2014/15.

4. Rail's role in delivering to cities and transhipping to last mile low emissions deliveries

A growing number of cities in the UK need to reduce air pollution to comply with EU regulations as seen by the Supreme Court ruling on London's air pollution violations. By 2020 Leeds will not be compliant with EU NOX regulations. Rail has far lower NOX emissions and lower particulates which are the key air quality problems. Two separate Colas Rail trials with TNT and Stobarts into Euston have proved that specialist freight trains can come into the heart of cities where the cargo can then be discharged into low emissions vehicles. Similarly, if rail connected consolidation centres are set up on the edge of conurbations rail can be part of the logistics solution by transporting the goods long-distance and then transhipped to low emissions vehicles for final urban deliveries.

5. Land use planning

We believe the NIC needs to be cognizant of the importance of land use spatial planning in delivering national infrastructure. Without coherent and integrated spatial and transport planning, the NIC, TfL and TfN will find it difficult to deliver the required rail upgrades. TfN can set the overall spatial planning framework for the North and direct local authorities to safeguard suitable sites and rail alignments for potential rail use in their Local Development Frameworks. For rail freight, it is crucial that local and regional authorities protect suitable sites for terminals for future potential use because there are a limited number of suitable locations which have the necessary rail and road connections. The Government's National Network National Planning Policy which includes the Strategic Rail Freight Interchange policy would support applications for SRFIs nationally significant infrastructure projects in the planning system.

6. Lack of a level playing field between modes

All levels of Government must take into account the scale of subsidy given to HGVs and the level

of external costs unpaid by the sector in their transport planning; HGVs impose almost ten times more external costs on the economy and society than rail freight. The latest research carried out for the Campaign for Better Transportⁱ using DfT values, found that HGVs pay less than a third of their costs, such as road congestion, road collisions, road damage and pollution which equate to an annual subsidy of around £6.5 billion. These conclusions are in line with a MDS Transmodal study in 2007 which found a very similar amount of underpayment: £6billion. The Government needs to recognise HGV costs in discussion about rail freight costs so that policy implications can then be understood in both directions with road and rail being examined across the piece. The level of HGV subsidy makes a compelling case for supporting rail, which imposes much lower costs on society and the economy, equivalently.

7. Upgrading key rail routes can significantly reduce road congestion on key strategic corridors

Research commissioned by CBT looked at specific routes which typically tend to be more congested because of more long-distance HGV traffic, particularly to ports. Its key findings were that:

- a) Some parts of road network have more long distance HGV traffic which could be carried by rail
- b) The impact of additional traffic in already congested conditions is far greater than a simple increase in pcu or vehicle kilometres suggest – it rises exponentially.
- c) In congested conditions each single per cent increase in traffic causes several percentage increase in congestion. In fact, Department for Transport figures state that a modest decrease in traffic of around 2%, results in congestion falling by 10%. DfT figures show that on congested parts of the network, congestion could be three to four times the percentage reduction in overall traffic levels, using a simple low congestion impact multiplier of 3-4.

The research found that in key corridors, such as the Trans- Pennine, London to East Midlands, Felixstowe to the North, Southampton to the North, Yorkshire and NE including M1 and A1, which all suffer severe congestion at peak hours the transfer of freight to rail could be significantly alleviate road congestion by removing HGVs.

<http://www.bettertransport.org.uk/sites/default/files/research-files/Freight%20mode%20switch%20report%20d6.pdf>

Importance and strength of rail freight as part of the logistics solution.

- Rail freight generates more than £1.6bn a year in economic benefits for UK PLC through improved productivity, reduced congestion and wider environmental benefits.
- Rail freight transports goods worth over £30bn a year, ranging from high end whiskies and luxury cars to supermarket products, cement and coal. Rail moves one in four of the containers entering the UK and half of the fuel used in electricity generation.
- The Hendy Review, which was tasked with reviewing the status of the Network Rail enhancement projects, acknowledged rail freight schemes deliver very high value for money. It stated that the average benefit cost ratio for rail freight schemes is between 4 to 5ⁱⁱ, which demonstrates that rail freight upgrades offer significant socio-economic benefits to the UK. Targeted infrastructure interventions work; the gauge enhancements out of the port of Southampton resulted in rail's market share increasing from 28 to 36% within a year of the completion of the work.
- **Terminals help regenerate local economies**
Local and regional authorities and LEPS therefore need to take into account the fact that rail freight terminals bring local re-generation benefits. Strategic rail freight interchanges (SRFI) can employ large numbers of staff directly. Daventry SRFI now employs around 5000 staff which will rise to 9000 when current expansion is finished. There is scope for terminals of all sizes which need new road/rail works.
For example, LEPS could help fund new roads to SRFIs and rail connections to the network for terminals through the Local Growth Funds.
- Rail freight industry has invested over £2bn since the mid 1990s

Rail freight's socio-economic benefits to society and the economy

- Rail freight is safer than road freight, HGVs are more than 6 times likely to be involved in fatal accidents than cars on local roads. *Source: Traffic statistics table TRA0104, Accident statistics Table RAS 30017, both DfT*
- Transfer to rail can reduce road maintenance costs as HGVs have an adverse impact on road infrastructure. The heavier HGVs are 160,000 times more damaging to roads than the average car- Source 4th Power law. This was shown by the high HGV charge for the M6 toll road, a private venture.
- Congestion benefits of rail freight - road congestion is now costing around £24 billion per annum according to the Freight Transport Association; the heaviest freight train can remove a 160 long distance HGVs from our roads – *Source Network Rail June 2010 Value of Freight.*
- UK rail freight produces 70% less Carbon dioxide emissions than the equivalent road journey- *Source DfT Logistics Perspective Dec 2008 P8 section 10*
- Energy efficiency of rail
A gallon of diesel will carry a tonne of freight 246 miles by rail as opposed to 88 miles by road – *Source Network Rail July 2010*
- Rail freight produces almost 90% less PM10 emissions than road freight and up to fifteen times less NOX emissions – *DfT Logistics Perspective Dec 2008 P8 paragraph 10*
- Damage and costs of main pollutants from transport
Road transport is the source of 80% of NOx in problem areas which rail can help reduceⁱⁱⁱ.

B.London's Transport Infrastructure

Protection of freight paths on the North London Line (NLL) and West London line (WLL)

These paths are vital to rail freight services irrespective of any extra capacity coming on stream out of the port of Felixstowe as they are needed for the following

- i) Two thirds of rail freight traffic has a London destination and that freight paths are not during rush hours.
- ii) The vast majority of London Gateway traffic will need to use the NLL.

iii) London Gospel Oak Barking electrification should include freight links to WCML and London Gateway.

There should be protection of potential and existing rail freight terminal sites beside railway lines with good road links for terminals of all sizes. As there is for riverside wharves which are protected through a GLA act. Rail sites should get the same protection as wharves. In the past, there was the SPG land for industry and transport.

Need both Strategic Rail Freight Interchanges for consumer products and more terminals for aggregates and other bulk products.

iv) Consolidation centres should be rail connected, as rail is well placed for long distance consumer traffic as well as traditional bulk commodities, to compete with road which would also have transshipment costs into smaller low emissions vehicles for example.

e) Channel Tunnel services into London were growing especially since the HS1 access to Barking Terminal and the reduction in CT charges but severely damaged by security issues at the CT.

C. Delivering future-proof energy infrastructure

Make using rail a planning condition for transportation, where practical, to reduce adverse impacts. Rail is currently used in the biomass and nuclear industry.

Philippa Edmunds Freight on Rail Manager January 2016

ⁱ Addendum to Metropolitan Transport Research Unit MTRU 2014 report February 2015. Heavy Goods Vehicles – do they pay for the damage they cause 2014

ⁱⁱ Ref 28 Hendy Review

ⁱⁱⁱ NOX costs the UK 6576 euros per tonne, in urban areas PM2.5 costs 194751 euros per tonne. Source Ricardo-AEA et al - Update of the handbook on external costs of transport 2014 using figures for 2010.

FTA Submission: National Infrastructure Commission call for evidence - London



January 2016

About FTA

The Freight Transport Association is one of the UK's largest trade associations and represents over 14,000 members relying on or providing the transport of freight both domestically and internationally, to or from the UK. Our members include hauliers, freight forwarders, rail and air freight operators, through to customers – producers, manufacturers, wholesalers and retailers. They cover all modes of transport – road, rail, air and sea. FTA members operate over 200,000 commercial goods vehicles on the roads in the UK; which is more than half of the UK fleet of goods vehicles. FTA members also consign around 90 per cent of goods moved by rail and around 70 per cent of goods moved by air and sea.

Introduction – UK infrastructure and logistics

FTA is pleased to be responding to this call for evidence. Infrastructure development in the UK has for too long been focused too much on the short term, stop start in its funding and has failed to adequately address national/regional needs in the face of local considerations. This has particular implications for freight as logistics is an inherently pan-national activity.

The efficient movement of goods is crucial to our society. Sometimes it is hard to remember the full scope of what is freight. At one end it is the heavy bulk movements like the construction material that makes our buildings and the waste that is taken away from our cities every day. At the other end, the book that is delivered to your house is also freight. Every cup of coffee you buy in a café is freight. Every piece of food on the shelves is freight. Every package of documents delivered to an office is freight. Every component or raw material used to supply a workshop is freight.

Without logistics society would grind to a halt overnight. In practical terms, everything that makes logistics less efficient adds to the cost of living and of doing business in the UK – everything that removes inefficiencies aids our development.

This is true of social objectives as it is of economic efficiency. More efficient logistics (through optimising mode used and ensuring free flowing movements) would help address emissions and safety issues – priority issues for FTA's members.

We look forward to working with the National Infrastructure Commission to help address the UK's needs as regards transport networks.

In the rest of this document, FTA will respond to the challenges identified and questions asked where they are relevant to our area of interest.

Response to Call for Evidence: London's transport infrastructure

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

London's population is expected to reach over 10 million people by 2030. This will increase demand for both personal travel for commuting and leisure purposes and also increase demand for deliveries and servicing activity. Due to the nature of the operations (ie final delivery to the customers' door) the vast majority of urban deliveries will always be made by road – therefore meeting the freight needs of the increased number of residents and increased economic activity in London will be a major challenge. Decisions will have to be made about the most efficient use of limited road space.

Transport for London estimates that central London congestion will grow by 60% by 2031. FTA believes that action needs to be taken now to secure the long-term sustainability of London if it is to maximise its competitiveness and attractiveness as a world city.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

- How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?
- What might their potential impact be on employment, productivity and housing supply in London and the southeast?

Future investment in large-scale infrastructure improvements should not just be aimed at solving current pinch-points, but also unlocking new areas for development. All too often, the transport infrastructure to support new development is an afterthought, and the true economic potential is not realized due to poor connectivity. East London is the prime example of a growth area with poor transport links, particularly cross-river road connectivity. However, Transport for London is now seeking to redress this with plans for a network of new road river crossings in East London – these plans must be fulfilled

Investment in public transport and alternatives to driving, to remove the reliance on private cars, is key to reducing congestion - freeing up space for essential or efficient traffic such as freight, tradespeople, pedestrians, cyclists, and disabled drivers.

However, investment in the core, motor-traffic oriented, road network should not be excluded and it is important to consider how various schemes interact with one another. It is essential that we achieve a sensible balance between the needs of different transport users so that we make best use of limited road space to benefit London overall.

For the freight industry, journey times are important, but arguably what is even more important is journey time reliability. If journey times significantly increase or there is a poor level of certainty about journey times which could result in reduced productivity per shift, due to the constraints of EU drivers hours rules, we will see transport operators having to put more HGVs on the capital's roads leading to increased transport costs, congestion and emissions.

London needs increased road capacity in key areas – river crossing in east London being the first example, but across London improved roads will be needed. There are social impacts from increased road use – ie emissions and safety. FTA believes that in the timeframes we are talking about here these should be addressed through improved vehicle technology – not through restricting the improvement of infrastructure at key pinch points and congested areas.

If the logistics industry is to successfully serve the needs of London's increased population and consequently increased business activity, it will require a more efficient road network than currently exists. In the case of freight more infrastructure will not exponentially increase traffic as our industry only moves the quantity of goods that society requires of us.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

- What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?
- What innovative funding mechanisms could be considered to support delivery of key schemes?

All funding options should be considered. However, we need to be careful of private ownership of key infrastructure – the Severn Crossing on the M4 is a prime example of where such a move can lead to high user charges long after the capital costs have been recouped. FTA accepts that user charges may need to be introduced to both fund new infrastructure and to manage demand. However, any demand management measures implemented on new schemes should be focused on those who have alternatives (such as private car drivers) rather than essential delivery vehicles which have little alternative option but to use the capital's road network. This is to ensure that there is an appropriate deterrent effect on those who in the main have an alternative choice – to use public transport – and to avoid additional cost to essential deliveries and servicing activity which has limited modal shift opportunities in the capital.

For more information, contact Christopher Snelling, Head of National & Regional Policy and Public Affairs at FTA:

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Contact: Jenny Bates – [email and telephone number redacted]

15th January 2016 (by arrangement with the NIC)

Thank you for the opportunity to comment in the call for evidence:

<https://www.gov.uk/government/consultations/national-infrastructure-commission-call-for-evidence/national-infrastructure-commission-call-for-evidence>

We wish to make some points in relation to section 3 on London's transport infrastructure.

We include as Annex 1, and refer you to, our submission to the London Assembly Regeneration Committee inquiry into Transport-led regeneration.

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

Economic and social challenges which face London must be considered and dealt with together with environmental challenges, according to the principles of Sustainable Development which underpins planning and of a which a definition is set out in the NPPF, and also in the London Plan

<https://www.london.gov.uk/what-we-do/planning/london-plan/current-london-plan/london-plan-annexes> .

This means that solutions to London's economic, social and environmental challenges must be ones which are win, win, win for all 3 areas – as the government says “We want to achieve our goals of living within environmental limits and a just society, and we will do it by means of a sustainable economy, good governance, and sound science.” <https://www.gov.uk/government/publications/securing-the-future-delivering-uk-sustainable-development-strategy>

Indeed the key challenges facing London are ones which are economic, social and environmental in nature.

Population growth is a key challenge for London in all these 3 respects – including on transport implications. Anticipated population growth should be dealt with sustainably as part of a national strategic strategy, however some inevitable increases in London must be dealt with sustainably from a transport point of view. Population growth will result in potential extra journeys, and so pressure on existing infrastructure and demand for further investment.

Dealt with in the wrong way and this could have negative implications on the economy such as, if traffic was allowed to increase, through worsened congestion. There could also be negative social implications from more traffic including more accidents, worse community severance, and such as health impacts and worse health inequality from the environmental problem of worse air pollution (as the most disadvantaged tend to live near main roads where air pollution is worst worse air pollution exacerbates health inequalities).

However there is an existing problem and challenge of there being too much dirty traffic in London - current and expected worse congestion, and current inequalities including health inequalities are themselves key challenges for London.

Air pollution is an environmental challenge but also an economic and social one. Economically there are costs estimated at up to £20B a year, congestion and air pollution kept London down to 38th place for liveability in a ranking of world cities (<http://www.telegraph.co.uk/expat/expatnews/10648488/Viennas-the-most-liveable-city-but-polluted-London-misses-out.html>), and this would be expected to have impacts on the economy as businesses want an efficient as well as a healthy environment for people to live and work in and to visit. Socially nearly 10,000 Londoners die prematurely a year due to air pollution, with the most vulnerable in society being disproportionately affected – and with the early deaths being just the tip of the iceberg below which there is ill-health.

The NIC will be aware that the UK is failing EU legal limits for the toxic gas Nitrogen Dioxide (NO₂) which were due to be met by 2010, and 2015 at the very latest. It will also be aware that a Supreme Court ruling has meant that the government was required to produce new plans by the end of last year to meet limits now in the shortest time possible, but that these plans have been deemed by those who brought the case to be not adequate (failing as they do to take all possible measures).

The EU Air Quality Directive's requirements are absolute, and that there can be no averaging of improvements and deteriorations across a zone. Not only is there a non-deterioration principle to protect relatively good air under limits, and the requirement that a breach not be caused, but also that air over limits must not be worsened.

It is not adequate to rely for compliance with EU law on whether a scheme would delay compliance for the Zone ie if there would be elsewhere in the zone with worse air, as has been argued by some based on the NN NPS – but following that cannot render the UK in breach of its international obligations such as the EU Ambient Air Quality Directive. This issue was referred to in the McCracken opinion obtained by Clean Air in London:http://cleanair.london/legal/clean-air-in-london-obtains-qc-opinion-on-air-quality-law-including-atheathrow/attachment/cal-322-robert-mccracken-qc-opinion-for-cal_air-quality-directive-and-planning_signed-061015/.

The London Plan requires development to be Air Quality Neutral (as at 7.14c) ie for air pollution not to be worsened. However, given the requirement to meet limits in the shortest time possible AQ Neutral is no longer an adequate criteria at this time. Measures proposed to mitigate the effects of a scheme must be done anyway, but the scheme itself not allowed to add to the problem ie the scheme not pursued. Only then, with all other possible positive measures and avoidance of negative ones, would illegal air pollution be brought within limits in the shortest time possible.

There are particular air pollution challenges with the gap between emissions of NO_x expected due to lab tests not being matched in real world driving emissions. The EU Council of Ministers agreed on 28th October 2015 on standards for EU Real Driving Emissions (RDE). The agreement was reached in order to address the discrepancy in emissions between laboratory tests and NO_x emissions found in real world driving. However the new standards would allow new types of Euro 6 diesel cars to emit more than double the Euro 6 NO_x emissions limit from 2017 to 2020, and 50% more after 2020, thereby de facto increasing the standard of Euro 6 from 80mg/km to 120 mg/km (http://europa.eu/rapid/press-release_IP-15-5945_en.htm). There is also the challenge of the VW and wider scandal to be taken into account.

The need to address the causes of climate change are also a huge challenge for London's infrastructure – on transport (and on which measures to tackle air pollution largely overlap with those to tackle climate), and also in buildings and housing (particularly in retrofitting existing stock, and in new build), and on energy supply infrastructure.

Also the impacts of climate change are another environmental challenge which will lead to huge social and economic challenges too – for instance heatwaves and the need to cool the tube, drought and our water supplies, more intense rainfall and the need to slow water's progress into drains are all huge challenges for London's infrastructure. The Mayor and London Assembly have done considerable work on this.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

The only strategic options are those which deliver on sustainable development in London ie those which help not hinder our ability to live within our environmental limits, and to build a just society ie options which are win, win, win for the economy, society and the environment.

As well as ensuring what vehicles are on our roads are clean, traffic levels must be cut.

No schemes which would add to traffic can be pursued, and only schemes which give people alternatives and help them out of vehicles can be pursued – and this is all the more so the more population is expected to increase.

Road space can and must be restricted and can be re-allocated to help deliver a step change in cycling and walking infrastructure to maximise the potential for these modes, and for public transport to address identified need for longer journeys.

- **How should they be prioritised, taking account of their response to London’s strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?**

The absolute priority is to progress only what will help deliver on environmental issues such as air pollution and climate change, as well as social issues including inequality, at the same time as developing our economy.

The first priority must be to plan to reduce the need for people to have to travel at all unnecessarily – by providing key amenities and work opportunities within easy walking and cycling distance of homes as much as possible. This is particularly important for any regeneration areas and where population or jobs are due to increase. This approach will help reduce pressure on existing infrastructure, and in turn the demand for further investment.

Facilities for safe and easy walking and cycling must be prioritised to maximise the potential for these modes, which are considerable – ahead of pursuing any identified need for new public transport to adequately enable longer journeys.

There is no place for adding to traffic levels – indeed all road users are helped by cutting traffic levels and less traffic helps congestion, resilience and journey times. Vehicle users are in fact helped by less traffic as this frees up existing roadspace for existing and some future new essential vehicle trips.

In East London a package of non-road measures including new non-road river crossings must be developed– the current road-building plans would add to traffic and so to congestion in the wider area (even if queuing at the existing Blackwall tunnel was reduced there would be worse congestion overall and at other places), and the plans would worsen air pollution.

Further infrastructure must not be allowed at City Airport – this is currently seeking a taxiway and new aircraft stands. City airport is a blight on East London with the aircraft noise, air pollution impacts, and the Public Safety Zone (PSZ) blights large areas around the runway itself. There would be multiple benefits from closing the airport (now that Crossrail will allow quick access to Heathrow) and freeing up the land for much needed housing and work and amenity uses

<http://www.neweconomics.org/blog/entry/why-its-time-to-close-london-city-airport>

- **What might their potential impact be on employment, productivity and housing supply in London and the southeast?**

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Crossrail 2 (any more than Crossrail before it) must not be allowed to develop at the cost of other small scale local transport improvements.

Also, if these mega projects are being pursued, it is essential that the benefits of the investment are maximised by investing in complementary transport measures to feed people into and out of the mega scheme eg walking and cycling connections, and also other public transport, so that the benefit reach out to as wide an area as possible.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

London-wide road user charging or pay-as-you-go driving must be seriously looked at for London –the Congestion Charge Zone in central London has been very successful in keeping traffic out, and a scheme is needed to cover the whole of London in order to cut traffic and congestion (and help with air pollution), and this can be a revenue earner to be used to give alternatives to driving.

- **What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?**
- **What innovative funding mechanisms could be considered to support delivery of key schemes?**

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

There are examples of how removing road space from vehicles has been done and been successful. For instance Seoul removed a key highway from its centre:

(<http://www.theguardian.com/environment/2006/nov/01/society.travelsenvironmentalimpact>)

Cities are now increasingly restricting road-space and traffic to tackle air pollution:

<http://www.theguardian.com/cities/2015/dec/09/car-free-city-oslo-helsinki-copenhagen>

(Oslo [revealed plans](#) to ban all private vehicles from the centre by 2019)

ANNEX 1 – Friends of the Earth submission to the London Assembly Regeneration Committee inquiry into Transport-led regeneration, August 2015 (also in the collated submissions for the inquiry <https://www.london.gov.uk/about-us/london-assembly/london-assembly-publications/transport-led-regeneration>)

To:
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From:
Jenny Bates, Friends of the Earth
[email and telephone number redacted]

31st August 2015

Re Inquiry: Transport-led regeneration

Thank you for the opportunity to comment on this important issue. We trust that, given that it was until the end of the month that responses to the inquiry were welcomed (see email chain below), you will accept our comments dated 31st August.

We wish to make the following brief comments, with reference to the Thames Gateway road bridge as a case study of ill-conceived transport-led regeneration.

We understand that Campaign for Better Transport will have made a submission referencing a report of theirs.

We wish to follow that up stating that it is our view that it is regeneration led by sustainable transport modes which is clearly the way to develop London sustainably in a way which helps address inequalities and helps us meet our environmental targets, and that road-building-led regeneration is not only counter-productive but also iniquitous.

Focusing on regeneration models which help improving accessibility through reducing the need for people to have to travel, by providing as much as possible, key amenities and work opportunities within easy walking and cycling distances not only enhances quality of life and health, but also takes the pressure off public transport.

Investing in public transport for any identified need to facilitate longer journeys helps all road users. It helps those without access to a vehicle and reliant on public transport, and also helps take the pressure off the road network – the aim should be that the road network should be left for essential vehicle journeys (both existing and potential new ones as a result of population growth).

By contrast investing in road-based regeneration tends to mean fewer people travel by sustainable modes (as people are attracted by driving), which is not only contrary to policy and also deprives people of the health benefits of active travel.

Non-road based regeneration makes much better use of space, enabling higher densities and more land available for housing and work opportunities, or public/open space – as providing space for roads and parking space is wasteful. The main businesses which tend to be attracted to an area when road-based regeneration is pursued would be vehicle-dependent development such as warehousing and distribution which tends to be low-density and low-employment usage.

Indeed, the evidence for road-based regeneration is very weak and potentially counter-productive.

The Greenwich Peninsula site should have been a prime development site, if its position next to the 4-lane

Blackwall road Tunnel was truly beneficial – yet the site lay dormant for a long time until British Gas paid English Partnerships £20m (as I recall) to secure a Jubilee Line Extension station on the site.

Further the proposed Thames Gateway road bridge (TGB) proposed between Greenwich and Newham, on proper scrutiny at a Public Inquiry in 2005-6, showed that the regeneration claims made for the scheme did not stand up.

Further, given the requirement in planning for sustainable development, whereby economic development, the building of a just society and the requirement to live within our environmental limits are required to be delivered together (ie through win, win, win solutions) it is clear that transport investment must be such that helps reduce inequalities (including health inequalities), and help deliver on environmental targets such as on climate change and air pollution – and that the pursuit of economic goals does not add to the problems of meeting either social and environmental goals.

Whereas non-road based regeneration helps deliver sustainable development, road-based regeneration adds to traffic levels (through generated traffic – whether overall or at certain times of day), and so worsens congestion in the area (though the pattern of existing congestion may change), and adds to air pollution.

More traffic and worse congestion and more air pollution blights and is clearly de-generation for local communities. Air pollution is an issue which hits the most vulnerable, and the most deprived the hardest (as they tend to live near the main roads where air pollution is worst) – and so adding to air pollution adds to health inequalities.

But worse traffic, congestion and air pollution is also bad for business and for regeneration – adding to congestion is clearly counter-productive, and air pollution makes an area unattractive for people to live or work or visit.

We wish to draw your attention to a few key links:

Case study: the Thames Gateway road bridge:

This press release and linked briefing refers to various issues raised by the planned TGB – on traffic generation and congestion, on air pollution, and on fewer people walking and cycling and using public transport if the scheme went ahead, and on regeneration.

Friends of the Earth's 2007 briefing from after the end of the TGB inquiry but before it was known the Inspector had recommended rejecting it

http://www.foe.co.uk/resource/press_releases/thames_gateway_road_bridge_06112008

Background briefing at the end of the Public Inquiry:

http://www.foe.co.uk/sites/default/files/downloads/thames_gateway_bridge_07.pdf

On traffic and congestion:

- Induced traffic: Professor Phil Goodwin

<http://stopcityairportmasterplan.tumblr.com/post/19513243412/induced-traffic-again-and-again-and-again>

- Transport expert John Elliott's slides showing when Blackwall tunnel was doubled from 2 to 4 lanes, traffic more than doubled within a year at peak time

<http://stopcityairportmasterplan.tumblr.com/post/20012814230/presentation-slides-arguing-the-case-against-the>

- John Elliott also has made clear that with more roadspace, more traffic would mean overall worse congestion in the area (though the pattern of congestion may change).

If congestion was relieved eg at the Blackwall tunnel/Silvertown Link approach then it would just mean that traffic had got on to another area quicker and making congestion worse there.

- The TGB Inspector's report stated that crossing was "likely to cause increased congestion"

http://www.foe.co.uk/resource/press_releases/thames_gateway_road_bridge_06112008

- A Hyder report which was buried by Greenwich warned of "The likely outcome would be the exhaustion of the Silvertown Link capacity within a relatively short timeframe with exacerbated congestion on the local road network." and "This could only be mitigated by a new high quality public transport link, such as a DLR extension."
<http://853blog.com/2014/05/06/buried-greenwich-council-report-criticises-silvertown-tunnel/>

Road building and air pollution:

- For example the TGB would have resulted in worse air pollution (see above)
- Kings college London did a study of widening the A206 (which was a key link to make a route all the way from the TGB to the M25 dual)

<http://www.sciencedirect.com/science/article/pii/S0048969714010900>

This showed:

- Local air quality deteriorated after completion of a road widening scheme in south London.
- The EU PM10 limit value (LV) was breached during construction.
- NO2 LV was breached after scheme due to increased cars, taxis and LGVs

Despite this evidence, TfL have continued to pursue new road-building and argued that it would help regeneration.

What they have not done is look at a proper package of non-road alternatives, which would include multiple non-road investments as well as road-pricing etc as required.

GB Railfreight – Response to the National Infrastructure Commission

London Transport Infrastructure Review

Q. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

Rail freight plays a vital role in bringing aggregates and other construction materials to London for major civil engineering and construction projects, as well as removing waste in the form of spoil. For Crossrail, GB Railfreight has transported over 1 million tonnes of excavated material from the tunnels to a new nature reserve at Wallasea Island in Essex.

In order to sustain growth across these markets, and continue supporting UK manufacturing and construction, it is vital that London possesses strategically effective rail connectivity and freight facilities. As such, we are going to detail areas that we believe need to be considered in the National Infrastructure Commission's Review.

a. Inland rail freight terminals

i. Aggregates terminals

In the Greater London Authority's Local Aggregate Assessment for London 2013, it was concluded that, with two years left to run on the Capital's landbank of permitted aggregate reserves, rail heads would be crucial in sustaining high levels of imports into London.

GB Railfreight supports the development of existing and new strategically effective aggregates terminals across London, which are truly open access for the rail freight industry, in order to deal with actual and prospective growing demand.

The key to adjusting to demand and not wasting spend on the wrong developments is focusing on sites that have economies to support them, as well as incorporating aggregates needs in plans for station rebuilds and enhancements (e.g. Euston station), and major programmes such as HS2.

Despite being intermodal terminals, both Stratford and Willesden freight terminals are prime examples of speculative builds subsequently closed, that suffered significant losses because, along with delay risks and road congestion costs, they had a limited market to drive business.

On the other hand, if we assess Hanson UK's Kings Cross Concrete facility, it has been able to grow into the second largest concrete site in the UK as a result of its strategic location. This growth has been supported by infrastructure at the facility, which allows it to accept large trains and offer significant storage space, as well as high levels of operational competitiveness.

It is also important to note that central and local government's commitment to selling off public land reduces scope for potential aggregates sites in London and, as a result, the Chancellor's 160,000 homes target.

GB Railfreight recommends that an evaluation is made of the markets across the Capital that require support, or further support, from an aggregates rail freight terminal.

ii. Cricklewood

Cricklewood represents the last location in London that is ideally connected for both road and rail freight. Companies operating there primarily carry out spoil and refuse haulage. In September last year, GBRf ran its first train for FCC Environment, transporting waste from its new North London Railfreight Terminal in Cricklewood to Buckinghamshire.

As the Capital continues to build, and major projects and programmes such as Crossrail and HS2 progress, more and more construction soils and materials need to be able to leave the capital efficiently and with the least cost to the environment. This comes at a time when London's roads are already seriously under strain. Cricklewood will, therefore, be crucial in helping remove lorries from London's roads.

The planned Brent Cross Thameslink railway station, as part of the Brent Cross Cricklewood development, will see various freight sites being moved from one side of the Midland Main Line to the other. Our concern is that could lead to the reduction in available land for freight, so we would like to see various sites safeguarded for freight prior to the move.

GB Railfreight recommends that freight sites at Cricklewood are safeguarded.
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b. Freight route investment

In order to support proposals around inland freight terminals and freight capacity in London, we need to address the problems of bottlenecks on key lines in and out of the Capital. These bottlenecks often occur on sections of two-track with flat junctions, such as on the North London Line, West London Line and South London Line.

The North London Line provides a nationally important and electrified freight route from the UK's largest ports, at Felixstowe and London Gateway. In order to cater for the planned growth of freight and passengers, and to do so robustly over the next 20-25 years, the North London Line needs additional signalling throughout and a new regulating point near Gospel Oak or Kensal Rise. Reduced planning headways (with additional signalling) are also needed between Gospel Oak and Barking.

Further capacity problems exist on the Midland Main Line north of St Pancras, which has been designated as congested infrastructure by Network Rail. The Line cannot cater for current demand, let alone future passenger and freight growth. As such, timetabling is crucial to limit delay. However, with the second stage of Thameslink opening in 2019, this will become even more difficult.

The investments made by the Strategic Freight Network fund, and work carried out by Network Rail to incentivise passenger growth, have increased the separation of freight and passenger services. Following West Anglia Route Modernisation and enhancements to the Great Northern Great Eastern line, there will be the potential to run freight and passenger operations from London to Doncaster in almost total separation. More opportunities to separate the traffics brings benefits to both modes of freight and passenger, whilst crucially retaining the ability to use both routes for contingency and maintenance provision.

GB Railfreight recommends that opportunities are evaluated for improving infrastructure capacity on the North London Line, South London Line and Midland Main Line.

National Infrastructure Commission
Response the call for evidence on London
Gravesham Borough Council Response

Introduction

Gravesham Borough is located in Kent south of the river Thames, east of the Dartford Crossing and has a population of 105,300. The main Gravesend/Northfleet urban area has a population of 84,400. The rest of the Borough is covered by Green Belt, though within that there are significant areas of Ramsar/Special Protection Area (North Kent Marshes) and parts of the North Downs Area of Outstanding Natural Beauty.

On the west side of the Borough north of the A2 is the Ebbsfleet Valley, shared with Dartford Borough Council, and now covered by the Ebbsfleet Development Corporation. The two Boroughs' remain the plan making authorities. Considerable development has been proposed and consented in the Ebbsfleet area, and is now starting to happen on the ground. The EDC is charged with accelerating and developing the vision for the 'Garden City'.

The Borough is crossed west-east by the A2 trunk road (4 lanes plus hard shoulders) connecting London and the M25 with North Kent and Dover. The M20, just to the south of the Borough, is the main route to the Channel Tunnel and ferry's. Both connect to the M25 which provides links round London and to the rest of the country.

There are three railway lines across the Borough, all running roughly east - west. The North Kent Line links London Charing Cross & Cannon Street with Medway Towns via Dartford & Gravesend. HS1 links London St Pancras with the Channel Tunnel with an international and domestic station in the Ebbsfleet. Domestic Services operate over HS1 from East Kent via Ashford and via Gravesend. Finally there is the Chatham line running through the rural area linking London Victoria with the Medway Towns and East Kent (east of Medway this is confusingly also referred to as the North Kent line). Travel times currently to central London are in the order of 60 minutes from Gravesend by the traditional routes and 24 minutes on HS1.

27% of the working population are employed in Greater London and commute by coach, rail & drive, and only 33% work within the Borough. 18% of journeys to work are by public transport and 65% are by car.

The Borough therefore qualifies as part of the 'London commuter hinterland' and there is a tension between a role (at one extreme) of being a pure commuter settlement and providing more employment in the Borough to produce more sustainable travel patterns.

The north of the Borough is part of Thames Gateway with significant redevelopment opportunities on former industrial land. Land values, compared with London, are relatively low so there are viability issues.

Question 1 Economic and Social challenges

Gravesham has an adopted Local Plan Core Strategy to 2028¹. Work for Kent County Council extrapolates this to 2031². The Council has commissioned technical work for the Local Plan including a SHENA (Strategic Housing and Economic Needs Assessment) which will update the objectively assessed housing need, employment and retail requirements and

¹ Gravesham Local Plan Core Strategy <http://www.gravesham.gov.uk/services/environment-and-planning/planning/planning-policy/gravesham-local-plan-core-strategy>

² KCC Infrastructure plan <http://www.kent.gov.uk/about-the-council/strategies-and-policies/environment-waste-and-planning-policies/growth-and-infrastructure-framework-gif>

look further into the future. This includes analysis of development land values and site viability. This study will be subject to consultation in the spring, but is likely to show, in line with the national household projections, higher levels of housing need. As a rule of thumb the latest national household projections suggest something in the order of a 25% increase in annual housing completions for Kent as a whole over and above levels set out in the South East Plan (as an arbitrary benchmark). This represents a major transport challenge for an already stretched transport infrastructure across the South East.

The Borough has a finite supply of brownfield sites, and once these are developed it will be necessary to hold discussions within the sub-region about the scale and location of development. This will include the role of the Metropolitan Green Belt and its boundaries. As noted above there are nature conservation and landscape constraints in the rural area. The Borough is the least self-contained in employment terms in Kent and there is an objective to increase local employment for sustainability reasons.

A major component of new development is in the Ebbsfleet area around the International and Domestic Station, shared with Dartford Borough. The overall strategy stems from the mid 1990's and the arrival of HS1, and required a significant modal shift. Planning permissions exist for the most of the overall area. The Ebbsfleet Development Corporation (EDC)³ is now taking this area forward and has commissioned a masterplan. It has £310 m to assist with infrastructure delivery over the next 5 years.

London Resort Company Holdings (LRCH) is proposing a leisure resort on Swanscombe Peninsula mainly in Dartford Borough, which is aimed at attracting 15m visitor a year and directly employing some 13,000.⁴ LRCH are continuing to develop their proposals and assess the impacts, but they are of major significance in creating demand for travel by both workers (13,000 jobs directly) and visitors (up to 96,000 per day at peak). It is currently intended to progress the development via an application under the NSIP process.

The EDC masterplan will deal with both a 'with and without' London Paramount world. Various sites have recently been granted Enterprise Zone status in the Ebbsfleet and at Northfleet Embankment. The new development needs to be grafted and integrated with the existing communities, complicated physically by the changes in levels brought about by the chalk quarrying of the past.

It has been known since the original work on Kent Thameside in the mid 1990's that given the local road infrastructure (and reasonable enhancements thereto) that a major shift to public transport was required to cope with travel demand along with additional local jobs. The HS1 station at Ebbsfleet was a key part of the strategy along with the Fastrack system. The later along with local bus routes, walking and cycling networks is the foundation on which rail sits.

The intention was to create a substantial amount of local employment to attract employees, especially from further east, and increase local self-containment. In Gravesham the housing market already includes a component of movement out of London and on further east, so commuting will remain a significant element.

A2 is highly congested and proposals are being developed junction enhancements to support development at Bean and Ebbsfleet. Proposals exist for additional crossing capacity either at the existing Dartford Crossing or east of Gravesend. A fresh consultation is about to occur on this contentious issue. The Borough Council opposes routes east of Gravesend on environmental grounds.

Both residents and businesses see transport as a key issue, as witnessed by reposes to recent consultations by EDC and LRCH. There is scepticism over the ability of the transport

³ Ebbsfleet Development Corporation <http://www.ebbsfleetdc.org.uk/masterplanning/>

⁴ LRCH <http://www.londonparamount.info/have-your-say/project-documents/>

system to handle new development and concern over the reliability of the system, especially by business.

Thus there are major transport issues locally, never mind the outworking of some of the considerations outlined for example in the London Infrastructure Plan 2050⁵.

It is important that a focus on major infrastructure projects does not exclude considerations of ease of use – covering such matters as information, paying tolls and fares. Progress is being made, slowly, on integrated ticketing for public transport but a similar approach is needed elsewhere. For example will it be possible to have one account to handle all Thames tolled river crossings?

The bus networks should not be overlooked – as there is a fundamental disjunction between method of organising bus services inside and outside London. In the former it is essentially specified by TfL whereas outside it is based on competition – which had de facto produced local monopolies. TfL services reach as far as Bluewater.

There is therefore a major challenge from growth to handle the demand for movement across the South East.

Q2 Strategic Options

The answer to this question has been addressed by mode to illustrate the complexity of the issues. The fundamental point is that this is a regional issue (meaning the wider Southeast), especially in relation to the rail network, not just a London one. There is finite rail capacity which is trying to meet the growing needs of passengers, both inside and outside London. The same is true of the strategic highway network which at peak times, and in some locations all day, highly congested. There is a big question, especially outside London, where on the Commissions timescale substantial new development is going to occur.

There is a tension between what might be called a London view of the world – seeing the inner South East as a source of housing for jobs in London – and a view seeking more local jobs and meeting local housing needs. In the local context this is exemplified by the counter weight that London Paramount would offer in terms of jobs.

The Commission is not in a position to determine future development patterns: it can only work on existing commitments and some future options. Major development outside London logically requires routes that support it which will suggest which corridors should benefit from, for example, Crossrail 2 or Crossrail 1 extensions but also possibly links that do not focus on London.

In arriving at changes to the network there is a danger in trying to fit a scheme to services, rather than specifying what services are needed (as a consequence of the future demand or existing congestion) and then providing the infrastructure that serves that. Many of the quick wins have been already made and future will require more Crossrail like schemes (e.g. Crossrail 3 from South East London) on the basis that terminal platform capacity is hard to expand.

Q2 Strategic Options: Road network

The A2 past Gravesend was widened in 2008 to 4 lanes, and moved slightly south. At peak times it is running at over capacity and a number of the junctions have started to show stress. The A2 is an important part of the local road network as well as its strategic role, for example past the Ebbsfleet only it and A226 (single carriageway road on a chalk spine) provide east – west links.

⁵ London 2050 <https://www.london.gov.uk/what-we-do/business-and-economy/better-infrastructure/london-infrastructure-plan-2050>

The current Dartford Crossing is severely congested and the Government has accepted the need for additional crossing capacity. A consultation is imminent on the options that have been recently refined either at the existing crossing (corridor A) or east of Gravesend (corridor C). Gravesham opposes corridor C because of the environmental impact. The debate about route choice will take place elsewhere but the need for additional crossing capacity (along with proposals inside London) is obvious. Once a route corridor is selected delivery of this scheme should occur within the current timeframe of 2025.

Highways England is committed to enhancing the A2 junctions at Bean and Ebbsfleet junctions to deal with existing problems (Bluewater) and development. London Paramount is working on a junction enhancement at Ebbsfleet to serve both their proposal and the already consented development. Various developments are committed to contributing to such schemes. This however ignores the cumulative implications on other junctions of development across the Gravesend/Northfleet urban area. Tollgate junction (A227) is already stressed. Lower Thames Crossing will make a difference depending on the option chosen, and it is not currently clear what the net effects will be.

The role of Fastrack has already been mentioned but both it and local bus services need to offer frequent, fast and reliable services. Depending on local circumstances this may involve dedicated routes, bus lanes on existing roads and measure likes priority at traffic signals.

On the highway network there is a tension between long distance strategic flows (cross channel traffic for example) and local commute. Highways England is charged with improving the strategic network and Transport Authorities (Kent CC in this case but Medway is also relevant) the local. Private developers are expected to fund improvements for their developments, for example London Paramount as noted above is looking to build a new access road and improve the Ebbsfleet junction.

Local Planning Authorities are trying to meet their housing and employment needs in a context where there is no overview of what the region, including London, needs to meet or the national transport infrastructure needed to support it. There must come a point when the transport infrastructure cannot handle additional development where the relationship between homes and jobs is critical.

Q2 Rail network

Rail network has already been described above. 12 car schemes and power supply enhancements have or are being implemented – the current short term need is for Southeastern or successor(s) to have sufficient rolling stock to run more 12 car trains. There is a particular need for additional high speed rolling stock as peak hour trains are regularly full and standing from/to Gravesend.

Safeguarding exists for Crossrail 1 to be extended out to Gravesend (passenger services) and to Hoo junction for stabling sidings. A study is currently underway looking at the case for extension and what infrastructure would be needed. This is related to the levels of development in Kent Thameside and proposals currently being explored along the riverside in the London Borough of Bexley.

A further complication is the “with and without” London Paramount cases. The later would certainly significantly enhance the need for services east and west from Swanscombe/ Northfleet to get labour to/from the development. The Borough Council would support the extension of Crossrail to help meet the need for additional capacity on the North Kent line, given the constraints further into London. There is an obvious logic in diverting as many passengers as possible (for whom it is an appropriate route choice) onto HS1 from Ebbsfleet, Gravesend and Medway. Crossrail could then do the same at Abbey Wood leaving the rest of the traffic on the traditional lines where expanded services provision should be possible. What is required needs to be explored further.

Transport for London and others have expressed a desire (with or without taking over the franchising role and making it a concession) for regular interval services on the various routes from Dartford into London. The precise nature of these proposals is unclear both in terms of service pattern, termini, infrastructure and rolling stock implications etc. The point of all this is to illustrate that the issue is not a simple one of infrastructure and requires the balancing of a number of factors. On rail issues at least there overall balance needs to be looked at in the context of transport for the south east – not just London.

Q2 River

Currently Gravesend is linked to Tilbury by a regular ferry service, subsidised by Kent County Council and Thurrock Council. The Borough Council has invested in a pontoon off the historic Town Pier to increase the potential usage. London Paramount has discussed services from central London to serve their development (and use of the river in the construction phase) and also provide access for labour from Thurrock. The potential of the Thames should not be overlooked as a transport corridor for both passengers and freight, where for example London Paramount has identified considerable scope in the construction phase.

Q3 Crossrail 2

No direct comment on this scheme other to note the on-going tension between an all stations inner suburban service and aspirations for it to serve destinations further away which implies a different sort of rolling stock and a lack of segregation, as illustrated by Thameslink.

Q4 Funding

Any schemes for new infrastructure will require funding and the Commission will no doubt be presented with a list of projects with a combined large price tag. Traditionally major strategic schemes, whatever the mode, have been funded by Government, whether directly or indirectly. The private sector has played a role (e.g. Dartford Crossing) where tolls can be collected and a funding model constructed. The Local Government funding model is in a period of austerity and it cannot be assumed to produce any greater financial input than hitherto.

Developers are often seen as a source of funding. Major schemes certainly require major transport investment – but this is likely to be for local transport requirements and not able to meet major strategic needs on a significant scale. The Crossrail/Lower Thames Crossing type schemes with costs in the billions will still require significant subsidy. Land values in the Gravesham urban area are only able to support local transport and social facilities to make the area function. The GLA CIL approach to Crossrail funding would for that reason be unlikely to produce significant income on current land market values.

Q5 Lessons for London

This question is interpreted as applying to London and its 'commuter hinterland'. The key points are:

- Transport is a South East issue not just a London one
- There needs to be a strategic regional view
- There are major issues with capacity across a number of modes

- Need to define the 'services' needed (what that means varies by mode) to meet the demand and then define projects that produce the required outputs
- Whatever happens the resulting plan will be a compromise between a host of factors
- There needs to be cognisance of how the system operates as whole (so ticketing, paying tolls etc. is part of the whole from the user perspective)
- Obvious anomalies (e.g. TfL rail concession model versus franchising, differences in the operation of bus networks) in legal framework across boundaries that hinder integration
- Gravesham is particularly interested in:
 - Lower Thames Crossing
 - A2 junctions
 - Full use of existing rail infrastructure
 - Extension of Crossrail 1
 - Development of interchange, bus, walking, and ticketing initiatives to make the overall system work
- Development in lower value areas won't pay for the big ticket items because of scale of costs involved

8 December 2016

MAYOR OF LONDON

Lord Adonis

Interim Chair
National Infrastructure Commission (NIC)
1 Horse Guards Road
London SW1A 2HQ

Date: 15 JAN 2016

Dear Andrew

Response to the NIC's call for evidence

Please find enclosed the Greater London Authority's (GLA's) and Transport for London's (TfL's) joint response to your call for evidence on large-scale transport infrastructure improvements in London. I also comment in Appendix 1 on your study on improving the balance between electricity demand and supply and in Appendix 2 on London's wider infrastructure requirements, which I hope will provide some context and stimulus for the Commission's future work.

Context

Investment in infrastructure is more vital than ever to sustain London's projected economic and population growth, given that the city recently surpassed its previous population peak of 8.6 million set in 1939.

The capital's economy is vital for the rest of the country and is an extraordinary national asset - one of only a handful of truly global cities on the planet. In preparation for this new era of growth, in 2014 I consulted widely on an infrastructure plan for the capital, setting out where growth is likely to come, the long term infrastructure requirements for the capital to 2050, how much they might cost, how we might pay for them, how the plan can adapt to technological change, and how infrastructure delivery should be better coordinated. Appendix 2 provides more background.

Crossrail 2 – the right scheme for London

With regard to new large scale transport infrastructure, my top priority and my first request for government funding is Crossrail 2. I am delighted that the NIC as an independent body can look afresh at this scheme. I am convinced that once the detailed analysis that already exists on this and other potential options is examined, the Commissioners will confirm their support for it.

It is the right scheme for London and the South East because of its unique combination of benefits, amongst which it will simultaneously:

- relieve a series of transport bottlenecks that exist on a network upon which central London's economy depends;
- provide new connections between areas of significant housing potential across the south east and London's main employment centres, thus boosting housing supply to support employment growth;
- support some of the most deprived parts of London.

MAYOR OF LONDON

Critically, it has overwhelming public support, which also means that it can be implemented with relatively little controversy or opposition. It has for many years had its route safeguarded; all other potential schemes would require years of development to get them to an equivalent stage. As part of its development, many alternatives have been considered, including enhancements to the existing rail network and smaller rail schemes. It is clear that no feasible alternative schemes, either individually or cumulatively, could generate the combination of capacity and connectivity benefits that together offer the transformative impact on economic performance that Crossrail 2 is expected to bring about.

Consequently, Crossrail 2 is my considered priority and that of TfL's Board. As you know, it also commands the support of London's business community.

I am now ready to proceed to the next stage of this project's development for which I need the Government's full support. We cannot relive the experience of Crossrail 1, which was conceived in the 1940s, took shape in the 1970s and 1980s, was (unjustly) rejected by Parliament in the 1990s, resurrected by my predecessor and me in the 2000s and will at last open in 2019, nearly 80 years after being first mooted. I am sure that you will want to help us all do far better for Crossrail 2. It is important that we do not keep going back to square one when there is a viable and popular scheme on the table. I have a brilliant team in place to deliver it. To put it another way, from now on, every six months delay by the Government will result in up to £4b in lost benefit including thousands of homes that could be built at or near a Crossrail 2 station.

Funding

There is no doubt that Crossrail 2 will be expensive, but I believe it is eminently affordable. During construction, its costs will be a small fraction of the regional economy that it will serve for decades, if not centuries, to come. We estimate it could deliver an economic boost of up to £7.9b per annum. Its construction will create 60,000 jobs and it will provide opportunities throughout the national supply chain, as has been the case for other major projects in London, including Crossrail 1 and the preparation for the Olympic Games.

Crossrail 2 should be funded ultimately by those who will benefit from it most, including those whose property values will increase as a result of the decision to build. We have time to develop a set of policies to capture a proportion of this value uplift to pay for the scheme, but we need to make good progress soon. I would also expect contributions from those outside the capital who will benefit from it.

Insofar as we remain a highly centralised state, fiscally, then we will continue to rely on government grant to fund it. Economically that would be rational given Crossrail 2's boost to a regional economy whose taxes go largely to the national exchequer. However, I have argued consistently for the devolution of fiscal powers to enable us to pay for much more of it (and other schemes) ourselves. Such powers could include a variety of taxes and similar instruments highlighted in the submission. The political acceptability and economic appropriateness of these can and should be assessed in more detail during the development phase. What is not acceptable is neither grant nor the powers to pay for the scheme ourselves, if the strength of the rest of the business case is accepted.

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Development funding

I am asking the NIC to recommend that the Government take the necessary steps to enable a Hybrid Bill to be submitted before the end of this Parliament. This requires an application for statutory powers in the coming years which would allow the delivery phase to commence in 2020 and the scheme to open by 2030. The sponsorship and consent costs associated with this are £250m and we are seeking the NIC's support for funding from the Transport Development Fund for a significant proportion of this. If insufficient funding is made available for these activities there is a risk of setting the project back by at least half a decade, which could constrain London's growth.

Key considerations for determining the appropriate allocation of national resources for major new 'national' infrastructure are set out below. These are intended to assist the NIC in making its recommendations to the Government on prioritising national resources for large scale transport infrastructure - and more immediately those required for planning and developing them:

- the scope for unlocking genuine economic potential through intensifying or transforming the way land is used, as expressed through economic performance measures such as GVA, and the extent to which this is additional at the national level;
- the key constraints that prevent people and places from realising their economic potential, including both transport bottlenecks and shortages of housing;
- the wider impacts including the sustainability implications of alternative strategic choices;
- the 'economic payback' of large scale infrastructure investment and the implications for national level funding through the impacts on fiscal receipts associated with the economic performance benefits;
- the opportunities for regional and local funding from development that is unlocked and other sources;
- the pressing nature of the strategic challenges and the timescale for addressing them, in particular the threats to continued growth arising from constrained transport capacity and inadequate connectivity as population pressure increases.

Conclusion

Overall I believe that once Crossrail 2's benefits are viewed holistically, its top ranking priority becomes clear. It will underpin new urban areas, support our nationally critical employment centres, boost the supply of homes, provide a large number of jobs, support a national supply chain, deal with major transport bottlenecks, give a lift to areas of national disadvantage, and reinforce a transport network that underpins the country's most productive region. It thus already commands widespread support. It is now time to get behind it with proper funding so we can build it in the 2020s.

I am confident that your Commission will support Crossrail 2. My team and I look forward to our continuing discussions and we will try to supply whatever further detail you may require.

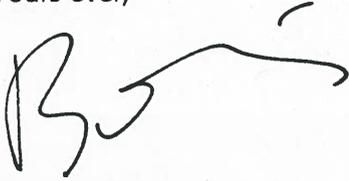
Other projects

For the avoidance of doubt, my only call on the NIC's Transport Development Fund is for Crossrail 2. More broadly, I also support a submission by the Chair of the West Anglia Taskforce on 4-tracking of the West Anglia Main Line, setting out its potential as a prerequisite to, and to bring forward the benefits of, Crossrail 2 (as set out in paragraph 32 in this submission); and a separate submission being made by a number of parties including the London Borough of Bexley on the

MAYOR OF LONDON

case for extending Crossrail 1 eastwards, which could enable substantial growth in the south eastern corridor from London towards Ebbsfleet and Gravesend. These and other schemes, such as the Bakerloo line extension and A13 Riverside tunnel that we are developing, are important parts of the necessary pipeline of transport investment described in paragraphs 34-40 of the submission, but for which we are not seeking funding (at least at this stage) from the Transport Development Fund.

Yours ever,

A handwritten signature in black ink, appearing to read 'Boris', with a long horizontal flourish extending to the right.

Boris Johnson
Mayor of London

Encs.

LONDON'S LARGE SCALE TRANSPORT INFRASTRUCTURE REQUIREMENTS

**GLA / TfL Submission to National Infrastructure
Commission**

January 2016

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1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

1. Since the advent of the modern Mayorality in 2000, London has benefitted from its ability to undertake integrated strategic planning. There is a suite of statutory and non statutory documents that draw on a common evidence base developed and tested by the GLA and its functional bodies (including TfL):
 - The London Plan¹ and Mayor's Transport Strategy (MTS)² in particular set out a clear strategic policy framework for planning London's growth over the next 20 years.
 - In 2014, the Mayor also published a London Infrastructure Plan for 2050 that looked beyond this horizon.³ This reflects some of the emerging challenges that have become clearer since the publication of the MTS in 2010, including stronger population and employment growth than previously anticipated and the scale of London's housing supply shortage, which were described in the Crossrail 2 Strategic Outline Business Case (SOBC). These are expected to be addressed in an updated MTS following the 2016 Mayoral election, in the context of the new Mayor's overall priorities.

Summary of key challenges

There will continue to be a critical national role for London in driving sustainable economic growth

2. The UK will be competing in an ever more globalised world in which large cities will play an increasingly important role as the economic dynamos⁴. London is at the heart of a network of world cities that have led this process and the UK benefits greatly from hosting one of these global centres. An important economic challenge facing London over the next few decades is to maintain and extend this role.
3. London hosts a major cluster of globally competitive sectors in and around its centre which benefit from large economies of agglomeration⁵ and this represents a source of UK comparative advantage in the world economy. The relationship between employment density and productivity in the 100 largest employment centres is illustrated in Figure 1. The evidence for economic mass and productivity effects is set out in the DfT's Transport Investment and Economic Performance report⁶.
4. Ready access to a very large population catchment as illustrated in Figure 2, is fundamental to London's ability to act as a global employment centre. This depends critically on the transport

¹ <https://www.london.gov.uk/what-we-do/planning/london-plan/current-london-plan>

² <https://www.london.gov.uk/what-we-do/transport/our-vision-transport/mayors-transport-strategy>

³ The Transport Supporting Paper in particular considered London's economic and social challenges:

https://www.london.gov.uk/sites/default/files/Transport%20Supporting%20Paper_3.pdf

⁴ McKinsey (June 2012), Urban world: cities and the rise of the consuming class

⁵ A number of locations make up London's global employment core (the West End, City, Isle of Dogs; Stratford is emerging as a further centre and may be joined by Old Oak Common). All are dependent on a shared set of network benefits generated by the radial transport system focussed on central London.

⁶ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/386126/TIEP_Report.pdf.

See Chapter 3, pp30 – 41.

network serving London and the wider south east⁷, which remains one of the densest and most comprehensive in the world, and which consequently represents a national asset of immense value.

Figure 1: The relationship between employment density and productivity in the 100 largest employment centres

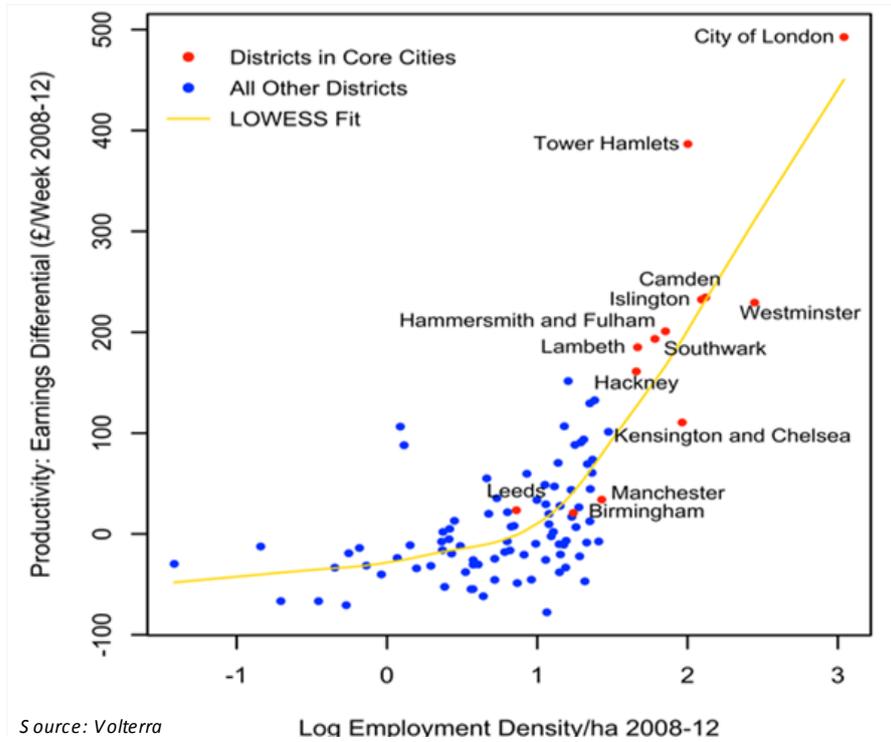
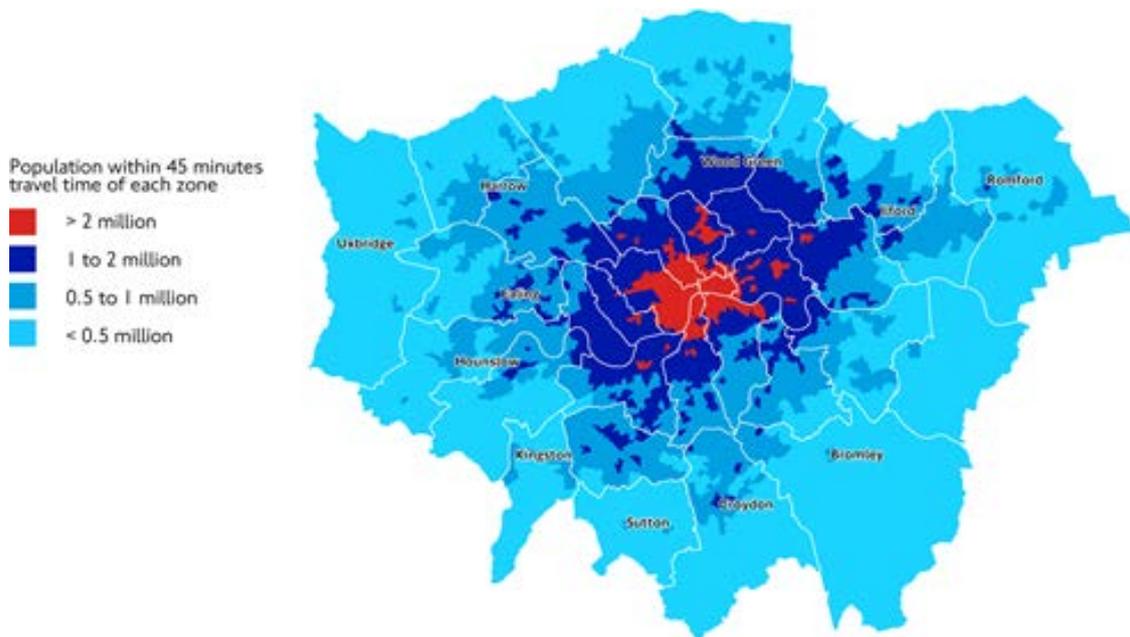


Figure 2: Accessibility: total population within 45 minutes' travel time



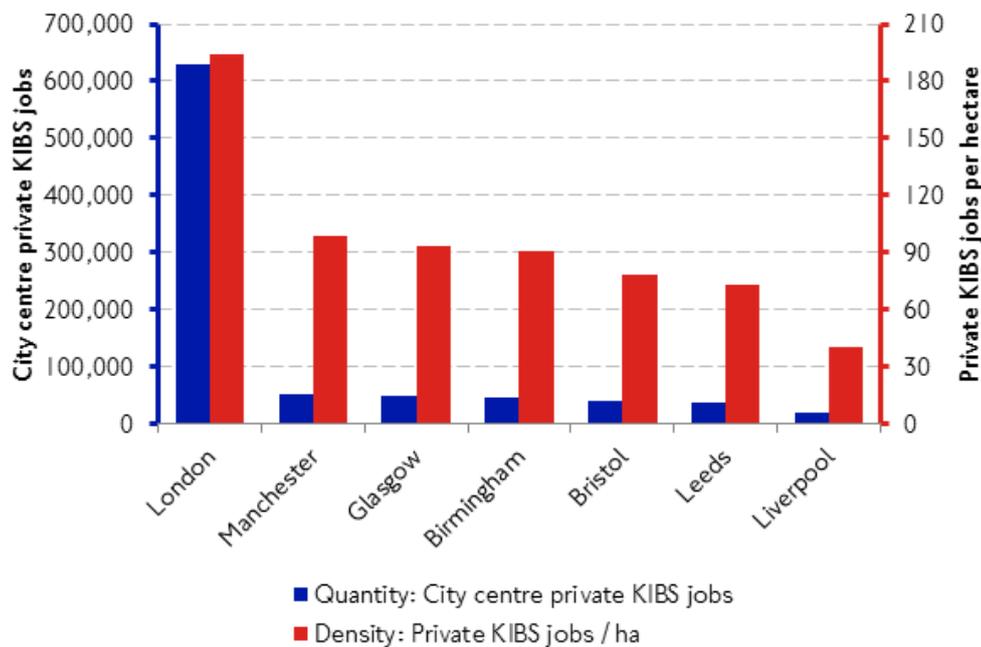
⁷ Around 1 million London workers live outside the city.

- There is in fact considerable scope to further increase employment density in London’s global employment core and to unlock substantial additional economic potential. Doing so will depend on further expanding the labour supply on which the area can draw.

The economic potential cannot be unlocked through any feasible alternative means, eg through ‘decentralising’ employment growth across different parts of London or other UK city centres

- London’s employment core hosts around 12 times the volume of Knowledge Intensive Business Services (KIBS) activity that each of the next three strongest centres host, at around twice the density, as shown in Figure 3. It is clear from this that to replicate in other UK cities the conditions that support London’s global role would require investment on a vast and likely unaffordable scale.

Figure 3: The volume and density of knowledge intensive business services jobs within seven UK city centres⁸



- While there is a strong case for making the UK’s other major city centres more internationally competitive by growing them, it is vital that this is seen as complementary to efforts to build on London’s existing strength rather than as an alternative to it. If London loses its competitiveness in the global markets in which it competes, overseas cities that can compete for these markets, rather than other UK cities, will attract much of the activity that is displaced. In this scenario the whole UK will lose out, including other cities which benefit from the interrelationships with London as a global hub. It is worth noting that cities such as Paris have plans for massive investment in new public transport to boost their competitiveness.⁹

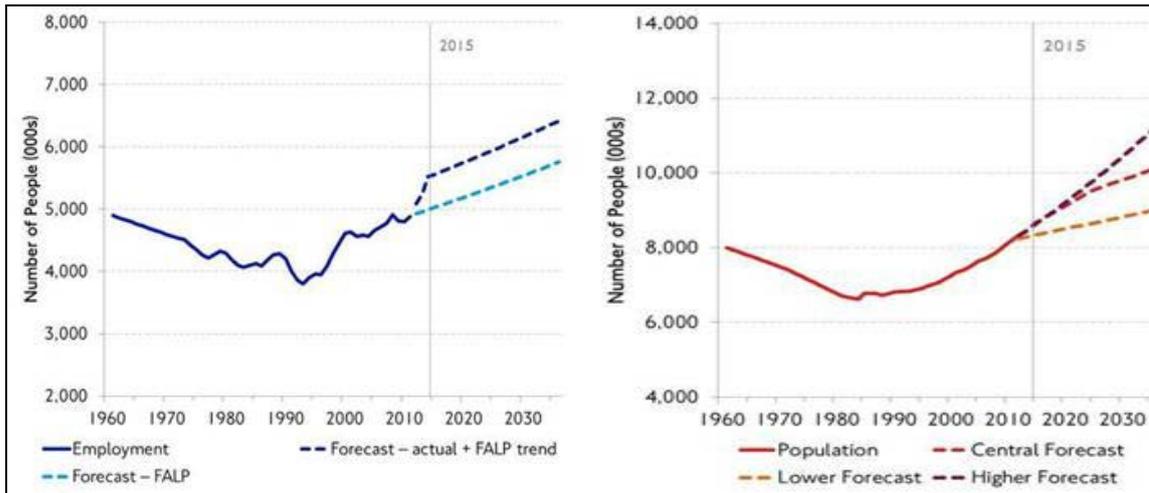
Growth in London’s employment core will drive population in the wider city and region, in turn sustaining employment growth in other parts of London and far beyond

⁸ Based on data from “Investing in City Regions,” Volterra, November 2014.

⁹ €40 billion of investment is committed to public transport to support the “Greater Paris” project.

8. London’s population is forecast to increase from 8.6m million to over 10m by 2036 while employment is projected to grow by 700,000 to 6.3 million, with recent forecasts suggesting even higher growth is possible. This depends however on supportive policies to expand the effective labour supply available in London’s key employment locations. Without these the likely outcome, based on historical trends, illustrated in Figure 4, is not stability but a failing economy and decline, with serious implications for the wider national economy. In particular there is a need to tackle the major threats that transport and housing supply constraints represent.

Figure 4: Historic trends and projected growth in London’s employment and population to 2036



9. London’s economic growth is fundamentally dependent on rail and tube capacity and connectivity – eight in ten arrivals in the morning peak are by rail (including the Underground and Docklands Light Railway). Despite committed investment, the scale of growth in travel demand is such that between 2011 and 2041, crowding is forecast to increase by 60% on the Underground and 150% on rail services¹⁰. Some of the greatest pressures on TfL and national rail services are on a north east / south west axis, which is benefiting relatively little from the current or planned investment. Whilst the current focus is on east-west (Crossrail) and north-south (Thameslink), the north east – south west axis has been acknowledged as needing additional capacity for many years.
10. The pressures are already being felt, with 8 out of the 10 busiest days in the history of the Underground being in October and November 2015. There are also enormous growth challenges on the national rail network. For example, the South West main line into Waterloo, the busiest section of the network, requires approximately 20% additional capacity to deal with existing overcrowding even before anticipated demand growth of 40% to 2043. This represents a key economic challenge since it has major implications for London’s labour supply. For example:
- it threatens to reduce people’s willingness to participate in London’s labour market;
 - access to the network is constrained at times, ie station closures owing to crowding;
 - other productive trips are crowded out;

¹⁰ There has been a shift from car to public transport over the last 15 years of around 11 per cent.

- there has already been substantial ‘peak spreading’, and further opportunities for retiming trips are limited.

To ensure London has an adequate supply of labour in the future housing supply constraints must be tackled

11. The London Plan identifies a need for 49,000 new homes per year,¹¹ while delivery has been around half this rate over the last 10 years or so. The resulting poor affordability of housing reduces the quality of life the city offers its labour force, which has damaging consequences for its international competitiveness:
 - business leaders rate the cost of housing as the second most important obstacle to improving London’s competitiveness;¹²
 - the functioning of the city depends on the availability of a variety of workers including those on lower pay;
 - the inequitable nature of access to London’s housing market is starting to damage its reputation as a city of opportunity and will affect the ability of London firms to recruit and expand.
 - there are also indirect economic impacts through impacts on disposable incomes.¹³
12. Capacity has been identified within London for 423,000 homes over 10 years,¹⁴ and the 2015 London Plan has put in place new policies to support additional supply through higher density development, linked directly to public transport accessibility. Assuming the backlog has already been made up, capacity (not yet identified) is expected to be needed for a further 500,000 homes in the decade from 2025. The London Plan identified key Opportunity Areas (including the Upper Lea Valley) and Areas for Intensification.

Despite its overall economic strength, there remains widespread and persistent social deprivation together with serious economic underperformance resulting from it

13. Tackling the inequalities in life chances that exist in London, by becoming a city of genuine economic and social opportunity for all, will not only be valuable in itself but will improve the quality of life of the city as a whole and strengthen its competitiveness. London’s complex and diverse economy depends on its ability to attract a wide range of workers at different income levels. It is worth noting that almost a quarter of London’s workforce earns less than the London Living Wage. Meanwhile, lower income workers are moving further out, leading to a ‘hollowing out’ effect and transport has become more unaffordable for such workers,¹⁵ threatening the ability of London’s core employment locations to attract the workforce balance needed in the future.

¹¹ To also address the existing backlog, 62,000 new homes per year will be needed.

¹² London First, “Home truths,” March 2014

¹³ Cushman & Wakefield Affordability Watch 2015

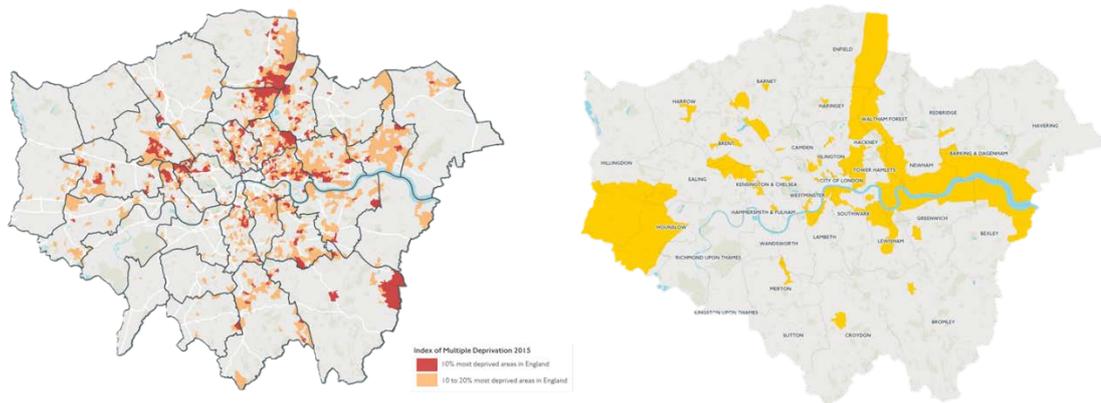
¹⁴ It will be critical in this period to ensure that the pipeline of approved units translates into delivery. Whilst on average over 50,000 housing units are given planning approval in London each year, only around 27,000 units are actually delivered. There is currently a pipeline of 261,000 approved units.

¹⁵ In 2014, it took at least an additional hour of work at National Minimum Wage to cover travel costs from outer London compared to 2005.

Furthermore, the social exclusion this could lead to could have wider consequences, damaging the reputation of the city as a place to live and invest in.

14. Pockets of deprivation exist across London and there are some geographical concentrations as shown in Figure 5.

Figure 5: The distribution of deprivation in London, 2015 (left) and London's Opportunity Areas and Areas for Intensification (right)



Some of the greatest unrealised opportunities for development are in locations in most need of regeneration

15. There is a close correlation with the Opportunity Areas identified in the London Plan, as shown in Figure 5. The Opportunity Areas:
 - are generally former industrial areas, with historically poor transport links to central London;
 - are typically trapped in a cycle of a poor quality built environment and low investment, remaining isolated from the wider success of the city;
 - represent London's main reservoirs of brownfield land and unlocking comprehensive development in them must play a crucial role in accommodating London's housing and employment needs.
16. The problems these areas face are of a scale and complexity that require coordination, in a way that markets alone are unable to achieve. New transport is a vital element and can act as a powerful coordinating mechanism for the other investment that is needed to bring about regeneration.

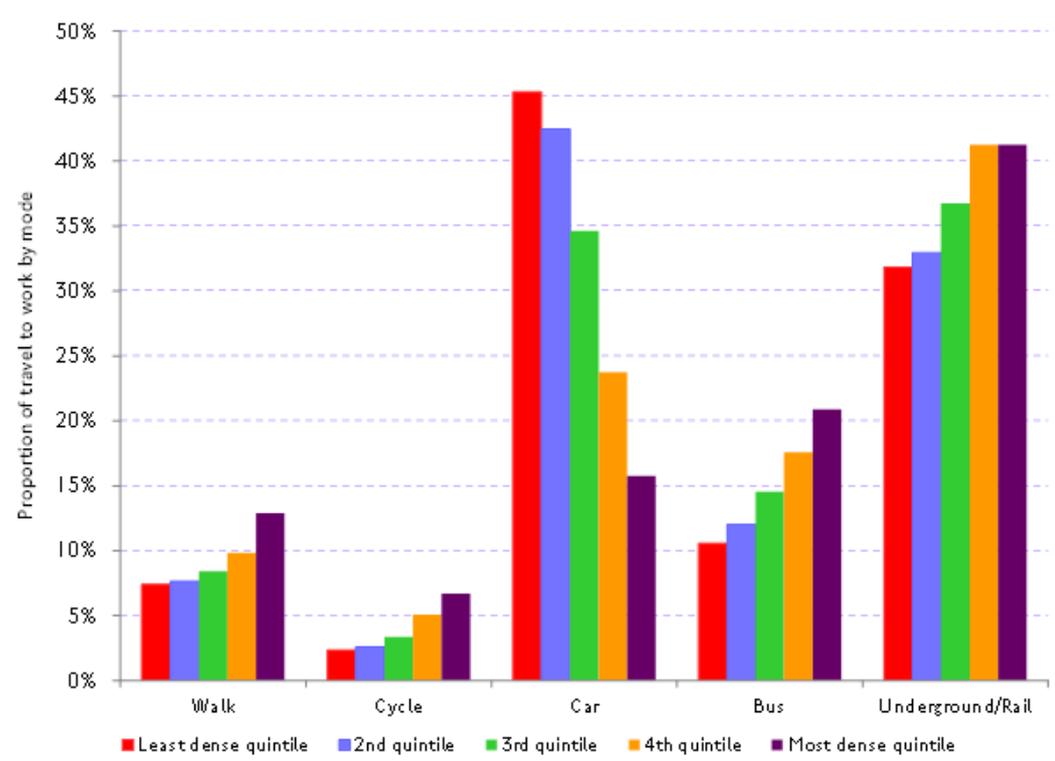
Additional housing potential must also be unlocked more widely across inner and outer London if we are to meet the overall needs identified above

17. While London’s town centres remain vital to the city’s economy, many major and district centres face decline in their traditional roles in retail and office markets. There are, however, opportunities for boosting housing supply in these locations in an affordable and sustainable way through transit oriented residential development. New connections can change market expectations, unlocking investment to make denser and better quality housing viable. This will help gain local communities’ acceptance for additional housing beyond that which they are already required to deliver. Planning policy also requires adequate transport provision as a condition for development.

Transport investment is essential to enabling the higher density development needed if London is to meet its growth challenges sustainably

18. The relationship between housing densities and travel behaviour in terms of choice of mode for journey to work is shown in Figure 6. This shows that 15% of people living in the densest fifth of London use car for travelling to work while 45% do so in the least dense fifth of the city. Given the congestion pressures facing London’s roads¹⁶, this indicates the importance of new housing being delivered through transit orient development at high densities.

Figure 6: 2011 travel to work mode shares of London LSOAs¹⁷ by density quintile



¹⁶ The rate of growth in congestion we now expect on London’s by 2031 has doubled, from 15% forecast in the MTS to 30%.

¹⁷ Lower Super Output Areas.

19. Improvements to the quality of London's urban fabric and environment will be important in maintaining and enhancing London's global competitiveness. Ensuring that new development and urban realm are well designed directly contributes to people's quality of life and well-being and will be ever more important as densities increase.

20. There are also growth pressures to accommodate more housing beyond London's boundaries. Focussing London's growth as far as possible within its boundaries is more sustainable than the alternatives and the London Plan aims to accommodate London's forecast population growth and need for housing within the Greater London boundary. Transport investment is critical to enabling the densities that this will require. Delivering more housing in reasonably close proximity to key employment areas also makes sense if we are to ensure an appropriate range of workers are available to meet London's labour supply requirements.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

- **How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?**
- **What might their potential impact be on employment, productivity and housing supply in London and the southeast?**

21. In recent years there has been an ambitious programme of investment to both expand London's public transport system and renew and upgrade the existing assets. Crossrail and Thameslink will be fully open within the next four years and the programme of modernising the Underground is well underway. This scale of investment has been possible through growing fare revenues, a strong commitment from successive Governments with grant funding, and prudential borrowing.
22. Key priorities for the coming years include the re-signalling of the Circle, Metropolitan, District, Hammersmith and City Lines and the Deep Tube Programme, which will mean new rolling stock and signalling on the Piccadilly, Central and Bakerloo Lines. We also need to get the most from London's existing railways - creating additional capacity on the network by introducing faster, more frequent, metro-style services and maximising the benefits of the heavy rail infrastructure that is already in place.
23. This investment will keep London moving for the next decade or so – ensuring that the large and complex public transport network can handle growing demand and at the same time enable a shift away from car use and meet transport users' growing expectations. It is vital that this programme is continued and its importance was recognised in the provision for capital grant funding made in the 2015 Spending Review (although the implications of the removal of the revenue grant need to be more fully understood).

The need for a pipeline of long term infrastructure investment, with Crossrail 2 at its heart

24. It is clear however that a pipeline of further large scale strategic interventions to provide 'new infrastructure' are going to be needed to meet London's growth challenges beyond the next ten years. This will help drive long term productivity and improve the public finances. We are cognisant of funding and supply constraints and our aim is to develop this into a coherent, phased and manageable programme that is affordable for London and the UK, with a strong focus on managing down costs and maximising value for money. A stable long term pipeline of investment will offer greater certainty for our supplier base, allowing better planning. Failing to achieve this can add 15% to project costs.
25. London's integrated strategic planning process, with the London Plan and the MTS at its heart, provides a framework for identifying and prioritising investment needed over the next 20 years, with TfL's business planning cycle providing more detailed prioritisation over the shorter term. The Mayor has also produced a 2050 Infrastructure Plan for London which looks to the longer term.

Together, these processes address all the different dimensions, geographies and transport modes involved in a city such as London over multiple decades

26. It is likely that new versions of the London Plan and MTS will be produced for the next London Mayor. We do not want to pre-empt this wider process here – but it is clear already that Crossrail 2 will need to be at the heart of these strategies and the pipeline of schemes and the NIC must support its ongoing development as a matter of urgency. Such an intervention requires a significant commitment of resources at the planning and development stage. Without this it will not be possible to meet the timescales for delivery that are required to meet the overall strategic planning challenges that have already been identified and are generally agreed upon.

Our focus for the NIC

27. Key considerations for determining the appropriate allocation of resources for major new ‘national’ infrastructure are set out below. Given the focus of the NIC these are narrower than those which underpin the London Plan and MTS. These are intended to assist the NIC in making its recommendations to the Government on prioritisation of national resources for large scale transport infrastructure – and more immediately those required for planning and developing them. The following should be considered:
- the scope for unlocking genuine economic potential through intensifying or transforming the way land is used, as expressed through economic performance measures such as GVA, and the extent to which this is additional at the national level;
 - the key constraints that prevent people and places from realising their economic potential, including both transport bottlenecks and shortages of housing;
 - the wider impacts including the sustainability implications of alternative strategic choices;
 - the ‘economic payback’ of large scale infrastructure investment and the implications for national level funding through the impacts on fiscal receipts associated with the economic performance benefits;
 - the opportunities for regional and local funding from development that is unlocked and other sources;
 - the pressing nature of the strategic challenges and the timescale for addressing them, in particular the threats to continued growth arising from constrained transport capacity and inadequate connectivity as population pressure increases.
28. The current MTS and London Plan both contain explicit support for prioritising a major new radial rail route serving central London on a northeast – south west axis and the Strategic Outline Business Case submitted to the Government in June 2015 sets out the case for this in detail, together with the expected impacts on capacity, journey times, housing supply, employment and productivity.
29. In particular, the scheme provides a major expansion of the system of radial transport links serving London’s global employment centres. This will relieve the growth constraints that are expected by the time it is due to open in the early 2030s. As well as solving a series of critical transport bottlenecks, it will connect the network serving London’s global employment centres to major

development areas, facilitating the dense new housing needed to help meet London's long term labour supply requirements. The key benefits include:

- crowding relief to a network forecast to be operating under stress despite significant planned and committed transport investments reflecting a combination of faster and more direct journeys, less crowded conditions on-train (notably SW, WAML, Victoria and Northern lines) and relief of crowding and delay at key stations, such as Waterloo, Liverpool Street, Euston and Vauxhall. For example, the scheme would contain growth in national rail demand at Waterloo - which currently stands at 82 million passengers per year - to 13% growth by 2041, rather than 50%;
- significant journey time benefits, eg a reduction of around 15 minutes between Wimbledon and Tottenham Court Road;
- 200,000 net additional homes (with appropriate new planning policies in place) over 20 to 25 years across London and the SE (the Crossrail 2 Growth Commission is reviewing this and an update will be provided to the NIC as part of TfL's 12 February submission). The land value uplift associated with these close to route homes only, and the associated impact of improved transport capacity and connectivity on housing density they represent, has been assessed at £15bn PV;
- once operational, up to 200,000 new jobs - between 50,000 and 70,000 new local jobs as a consequence of enhanced development, and some 135,000 in central areas;
- in addition there would be temporary employment of up to 60,000 construction jobs (including supply chain).

30. As part of the development of Crossrail 2, many alternatives have been considered, including on Network Rail solutions as well as alternative schemes. While it is feasible for a package of alternative schemes¹⁸ to address some of the problems in the same corridors, there are considered to be no feasible alternative schemes, either individually or cumulatively, that could generate the combination of capacity and connectivity benefits that offer the transformative impact on economic performance that Crossrail 2 is expected to bring about.
31. The critical feature of Crossrail 2 is that it provides large scale new capacity across central London that addresses a series of bottlenecks associated with the mainline termini and onwards links from them. In contrast, improvements to national rail corridors in isolation would place extra pressure on London's crowded main termini, and on key pinchpoints on the Underground network. For example, while four tracking the West Anglia mainline is a prerequisite to Crossrail 2, its full benefits are contingent on the extra capacity within and across central London that Crossrail 2 delivers. Similarly, the benefits of increasing capacity on the South West mainline depend on the elimination of other bottlenecks on the routes that link it to the main employment centres.
32. By tackling a series of critical network bottlenecks and creating new and better connections (easing housing supply constraints on future labour supply), Crossrail 2 will facilitate a significant increase in the overall economic density of London's key global employment centres. This is the basis for the estimated increase in numbers of jobs of 135,000 in these very high value areas. The resulting net

¹⁸ for example four tracking the West Anglia lines between Tottenham Hale and Broxbourne, with five tracking improvements into Waterloo

additional Gross Value Added (GVA) to the UK economy is estimated to be in the range of £1.2bn – £7.9bn per annum by 2041 (ie up to £102bn). This analysis shows how Crossrail 2 offers the opportunity to achieve significant increases in the productivity of London and the UK and to cover much of its costs through increased wealth generation and tax receipts. Nevertheless given the widely dispersed nature of the issues that together need addressing if London is to meet its strategic challenges effectively, it is clear that no single scheme will on its own be enough.

33. We are asking the NIC to recommend that the Government take the necessary steps to enable a Hybrid Bill to be submitted before the end of this Parliament. This requires an application for statutory powers in the coming years which would allow the delivery phase to commence in 2020 and the scheme to open by 2030. The sponsorship and consent costs associated with this are £250 million and we are seeking the NIC's support for funding from the Transport Development Fund for a significant proportion of this. If insufficient funding is made available for these activities there is a risk of setting the project back by at least half a decade, which could constrain London's growth.

Integrating more areas into the transport network

34. This is why Crossrail 2 is the focus of our ask to the NIC. Nevertheless given the widely dispersed nature of the issues that together need addressing if London is to meet its strategic challenges effectively, it is clear that no single scheme will on its own be enough.
35. A mixture of further strategic, intermediate and smaller scale schemes is needed beyond Crossrail 2 to unlock development and tackle particular challenges by knitting more parts of the city into the transport network. This will fill gaps in connectivity to enable more areas of the city to fulfil their potential, help address London's housing challenge, and ensure Londoners can access the opportunities and benefits of the city's growth.
36. This includes schemes such as a Bakerloo Line Extension, which will improve connections between central London and key opportunity areas in south east London, unlocking major housing potential and an extension of Crossrail beyond Abbey Wood towards Ebbsfleet which will help realise the housing potential of a key area of the Thames Gateway. These will help develop other corridors that complement the cross London 'spines' of Crossrail, Thameslink and Crossrail 2.
37. We are not seeking funding from the NIC for these other schemes but would welcome the support of the Commission for greater devolution of powers and funding mechanisms to enable cities like London to develop and progress such a pipeline of investment to help drive economic growth for the UK and tackle the challenges we face.
38. For example, in more recent years there has been an increasing focus on ensuring a similar 'upgrade programme' for our roads, as well as rail. London's roads are vital to the efficient day to day movement of people and goods and in fact support the majority of journeys made in the city. The Roads Modernisation Plan represents the first tranche of investment associated with this programme. It does not however provide sufficient funding to realise the fuller vision; in fact a large funding gap exists for sustained and more strategic roads investment.

39. Unlike public transport modes, which generate revenue from fare payers, there is very little cost recovery on the roads. Under the new system of VED announced by Government, revenues will be ring-fenced for spending on strategic roads in England (those operated by Highways England) from 2020/21. It is vital that the strategic road network within London (which was transferred from the Highways Agency in 1999) also benefits from this funding stream, with projects such as New Thames crossings vital to unlock jobs, homes and growth across the east of London by addressing the severance that hinders integration of the economy north and south of the river.

40. TfL is working on a number of these potential infrastructure options to address the range of different challenges which will inform the development of any new MTS. But these are not alternatives to Crossrail 2.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

See separate submission with agreed deadline of February 12th .

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

- **What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?**
- **What innovative funding mechanisms could be considered to support delivery of key schemes?**

41. Following the 2015 Spending Review, TfL's Operating Grant is being phased out; and, in light of the prospective full devolution of business rates, it is possible that from the 2020s funding of the renewal and upgrade of TfL's core Underground and rail network will come entirely from non-Government sources (i.e. a combination of fares, third party income and local taxes such as council tax and business rates). This represents an unparalleled step-change in TfL's relationship with central Government as TfL transitions to financial self sufficiency.
42. London is unique in that many of its transport projects have a substantial economic benefit and are partly or even fully self-funding, even under the current fiscal regime in which less than ten per cent of taxes paid in London are retained in London. The extent to which different schemes require central Government funding varies, with schemes such as the Northern Line Extension being entirely locally funded through developer contributions and retained growth in business rates. Crossrail has a Government contribution of around one third of the cost.
43. Building on PwC's 2014 Funding and Financing Study, the Crossrail 2 Business Case shows that London could contribute over half of the funding for the project, through direct contributions and borrowing against a variety of sources:
 - Net revenues generated by train operations;
 - Over Station Development / sale of surplus land;
 - Continuing the Mayoral Community Infrastructure Levy (CIL), at an increased rate;
 - A continuation of the Business Rate Supplement (BRS) – currently hypothecated to Crossrail 1 – beyond the repayment of Crossrail debt;
 - continuation of the London-wide Council Tax Precept originally established for the Olympic Games, currently due to end after 2017/18.
44. If we are to be able to increase London's contribution to Crossrail 2 (and fund other needs of a rapidly growing city at the same time), then we need to enhance London's ability to capture and retain the additional revenues that will result from the economic benefit of major transport improvements, including effects on property values and business taxes. This could include consideration of:
 - Stamp duty land tax (e.g. as a 'payment by results' mechanism within specified zones where growth in housing would be unlocked, or more widely, linked to delivery of housing targets);
 - Enhanced retention of business rates (including the proceeds from revaluation as well as stock growth);
 - Reform of residential property taxes (council tax)

- Borrowing capacity for opportunistic early land acquisition around planned transport investment corridors (as many local authorities, who do not face the same borrowing restrictions, do);
- CPO and MDC power to assemble land ahead of formal funding announcements;
- TfL to acquire land compulsorily not only for transport, but also for regeneration and housing;
- TfL to grant long leases on new residential buildings above its stations;

45. Some local sources of funding have limits. Fares on the Underground network are already quite high in London relative to other major cities around the world, but TfL currently does not achieve an operational surplus on its business as a whole so as to be able to fund major incremental capital investment. The ability of the Mayor to impose higher local taxes or to raise debt is severely constrained by central government. Congestion charges already fund a proportion of investment on the roads network, but in fact, relatively little revenue in London is raised from the roads, in stark contrast to the over 30% of TfL's income that comes from Underground and other fares. This means road improvements are either reliant on central government grants or contribution from public transport users. The Silvertown project will be funded by new tolls on road users, which could offer a model for a way forward for some schemes, but will not help solve the wider problem of how to provide the funding needed to cater for a growing population.
46. Londoners pay about £0.5 billion a year through Vehicle Excise Duty (VED). This money currently goes to central Government for general public expenditure, but from the end of the decade, all VED in England will go into a Roads Fund to pay for sustained investment on the English Strategic Road Network (the network managed by Highways England). Given that VED is linked to the specific address of the vehicle owner, there is a particularly strong and justifiable basis for hypothecation of the revenue raised in London for use on its strategic roads or transport infrastructure, or devolution of the power to determine VED structure to London.
47. It is likely however that even the sources set out above will be insufficient to fund the investment needs of transformational schemes such as Crossrail 2, as TfL has made clear in its submission. Crossrail 2 also generates a very significant proportion of its transport benefits (around 30%) from origins outside London, as well as housing impact in the wider South East, national supply chain impacts, and significant employment and productivity gains at the national level, so in the absence of more radical devolution proposals (which are likely to be many years hence), support from the Exchequer is both appropriate and necessary.
48. As regards financing and delivery, TfL's investment programme is financed using a mix of sources including borrowing from the PWLB, from the capital markets, and using private finance in models for projects such as the Silvertown river crossing. In each case, the decision is made based on value for money considerations.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

49. There are a handful of city regions in the world of a similar scale and level of development to London¹⁹, including Paris²⁰, New York²¹, Hong Kong²² and Singapore²³. While all of these cities face competitive challenges, London is growing at a faster rate than the others²⁴. All have policies in place that seek to encourage higher density development around rail stations, reduce dependence on the private car and support greater use of sustainable modes. London can be regarded as a strategic planning leader, with well integrated land-use and transport strategies in place to deliver sustainable growth. It has been unique in delivering a major shift away from car and to more sustainable modes in terms of relative shares (around 11% since 2000). However, compared to other cities the funding to support growth is less secure and the time cycle for funding is not integrated with planning cycles.
50. In Paris, the planning authorities and RATP have developed a long term land-use planning and transport investment strategy, known as 'Grand Paris' with an estimated investment requirement of €200 to €300 billion of investment to 2025 (although this horizon is now expected to be extended). The plan includes 100 major urban reconstruction projects and is expected to deliver approximately 70,000 housing units per year as well as office space through densification of urban areas around new stations. Investment of €40 billion in public transport is envisaged, with a significant emphasis on improving orbital connections between existing outer high density housing areas. It is however important to recognise that the spatial development context in Paris is very different to London's, with greater constraints in the city centre and a more polycentric pattern of employment, which is less reliant on agglomeration benefits.
51. The city state of Singapore has had a consistent strategic policy approach towards growth and development since 1971, based on transport-orientated development along mass transit spines connecting into the central business district (CBD). Since the early 1980s Singapore has been investing in expanding and improving its metro network to improve access to the CBD. Bus services act as feeder services, with easy interchanges at metro stations and don't duplicate metro lines. The Land Transport Authority (LTA) owns metro infrastructure and invests in new capacity. There are plans in place to double the length of the metro network by 2030. Funding is provided by Government and future fare incomes, which support borrowing. Around a third of the operator's revenues are raised from non-fares sources, such as rental incomes and advertising at metro stations.
52. MTR, the urban transit agency of Hong Kong, is notable for being very active in property development not just at stations but in the catchment areas around them. The government grants

¹⁹ The population of London's metropolitan area is 13.9m using the Eurostat definition. The wider labour market catchment, extending across the wider south east has a population of 23m (GLA).

²⁰ The Greater Paris population is around 12m.

²¹ The population of the metropolitan area of New York is around 12m, with around 20m in the wider labour catchment area.

²² Hong Kong's population is 7.6m.

²³ Singapore's population is 5.5m.

²⁴ Around 1.5% p.a. in London and between 0.5% and 1.3% p.a. in the other cities.

exclusive property development rights for land in the vicinity of metro station areas to MTR below market rates. Hong Kong has been a pioneer in using this approach to fund railway projects, and other cities are increasingly looking to implement it. TfL's land holdings are more localised than MTRC and focussed on operational requirements, and there is a much more circumspect approach to the scope of planning powers, which means only land needed to meet railway requirements can be included at present.

53. New York also has a different spatial pattern to London, heavily affected by its specific site and the density of commercial and residential development in Manhattan. Plans in New York include an additional subway (2nd Avenue) and better connections between the boroughs. New York's funding reflects the set up of city, states and federal levels, and includes cross subsidy from road crossings and a small but significant employment tax. There is also the use of developer contributions for specific schemes (such as the Hudson Yards). It is worth noting that New York is receiving 50% of its funding for the 2nd Avenue & East Side Access projects (as well as 50% for the emerging proposals for a new Hudson River rail capacity project) from the Federal Government – higher than Crossrail 1 or the proposals for Crossrail 2.

Appendix 2 - Setting London in context

The challenges of growth

1. London's infrastructure challenges are closely tied to population growth, which in turn reflects the strength of its economy. London's population is growing rapidly, with the city recently eclipsing its 1939 peak of 8.6 million people. Current projections suggest that London will reach 10 million by 2030 and 11.3 million, more or less, by 2050. Such rates of growth will place significant pressure on London's infrastructure systems - most notably housing and transport, but also energy, water and social infrastructure. There are also key economic, social and environmental implications. In order to manage growth successfully London will require a significant programme of infrastructure investment, alongside innovative approaches to infrastructure and development that will allow us to be more efficient, particularly in the context of reduced availability of funding and natural resource constraints.
2. Growth is in many respects a reflection of London's success – a testament to its productivity and competitiveness, the positive international perception of London and its status as a global city. People want to live and work in London, and businesses want to invest here, recognising the opportunities London provides. But unfortunately growth brings challenges and distortions – particularly to the housing market and also in terms of infrastructure capacity. In order to sustain London's position as a top tier leading city in the global economy, further investment in infrastructure is required to increase productivity and quality of life. Despite the challenges growth brings, research undertaken for the GLA suggests most Londoners are positive about growth. A recent telephone survey with 1,000 adult Londoners found that more than 60% of Londoners believe growth will benefit them; the challenge will be to ensure this is the case¹.
3. Ensuring London meets its infrastructure challenges is not just an issue for London, but indeed the rest of the UK due to the significant contribution London makes to the UK economy. Output per worker is significantly higher in London relative to other UK cities, with London's GVA per hour standing at £38.80 in 2013 rising to £42.80 in Inner London, compared to £31.10 for the rest of the UK². London also makes a significant net contribution to the national exchequer
4. A skilled workforce combined with a comprehensive transport system enables this higher level of productivity, allowing for agglomeration benefits and a competitive clustering of jobs, business and economic activity. Despite recent investment, we know that London's transport network is undermining productivity due to capacity constraints – even after accounting for Crossrail 1, and house prices are serving as a disincentive to locate in the capital for many workers. London's rate of productivity growth lags rival global cities such as Paris and Madrid.
5. Research undertaken by GLA Economics found that other parts of the UK benefit from proximity to London due to spillover effects, and as such maintaining productivity in London is essential to ensuring the on-going growth of the UK economy. Efforts to rebalance the economy should not be at London's expense; rather they should be in tandem with investment in the capital.

Work undertaken to date: The London Infrastructure Plan 2050

6. In 2014 the Mayor published the London Infrastructure Plan 2050 (LIP2050) to ensure that London has the infrastructure it needs to remain one of the best cities in the world in which to

¹ Telephone survey with 1000 adult Londoners in March 2015

² GLA Economics, 2015, 'Productivity in London'.

live, work and do business. The LIP2050 sets out a series of expectations regarding the delivery of infrastructure in the 21st century – digitally connected, green, integrated, innovative, and understood as a system of systems. The LIP2050 acts as an evidence base for an on-going, strategic conversation about London’s future infrastructure requirements, and has strong potential to inform the development of a new National Infrastructure Plan. It will also inform the mayor’s statutory strategies which will require revision following the Mayoral election in May 2016 – these include the London Plan (the overarching strategy for the capital and London’s spatial development plan), Economic Development, Transport and Environmental strategies.

7. In view of environmental and fiscal constraints our analysis found that London as a city needs to operate more efficiently and sustainably in order to meet its future infrastructure requirements. Investment in the context of growth should be targeted at improving productivity, increasing resilience and promoting sustainability.
8. In the recent past, the Mayor has focused on leveraging infrastructure investment to unlock housing development (and to obtain financing for infrastructure from development, as was done with the Northern Line extension – an innovative model which can be imitated elsewhere). However, in the longer term, the expectation will be that investments in new infrastructure will be made in tandem with smarter land use, improved planning and coordination of infrastructure relative to development.

Other elements of the London Infrastructure Plan

9. London’s infrastructure requirements beyond transport are significant, and at the heart of these requirements is housing. Increasing housing supply is the number one challenge facing London as a city. The London Plan sets out a target to build 49,000 homes a year to meet historical and arising housing demand. Such a number requires a near doubling of current output, to a level of supply not seen since the 1930s. Infrastructure, (particularly transport infrastructure) is one of the key levers available to unlock sites for housing development throughout London. As a case in point, the impact of Crossrail’s arrival in 2018 can already be seen, with more than two fifths of planning applications within a kilometre of a Crossrail station citing the new railway as a justification for the development proceeding – equating to around 53 million square feet of residential, commercial and retail space.
10. Infrastructure has the ability to make sites viable for development, and as such it is important that it is planned, delivered and coordinated with this in mind. There is also a need for the public sector to be more active in capturing the value generated by infrastructure investment, as this will allow for further investments, and provide a funding source.

Utilities

11. Housing and transport are not the only areas for further infrastructure investment. In order to ensure sustainable growth outcomes, attention also needs to be given to the key utilities which underpin the effective functioning of London, including water, digital connectivity and energy. Ensuring delivery of these required services is complicated by the fact that the Mayor does not have strategic authority over these areas, even though the Mayor is required to set the overall development strategies for the city.

Water

12. A growing challenge for London, with key issues relating to water security, flood risk and water quality needing to be addressed. Estimates put forward as part of the LIP2050 work identified an emerging supply and demand gap reaching 10 per cent by 2025, and this could be exacerbated by issues such as a failure to address leakages or encourage more sustainable rates

of consumption. The GLA is working with London's water companies and Ofwat to address some of these challenges; however as part of later stages of the work of the National Infrastructure Commission it will be important to identify how these challenges can be collectively managed in a cost effective but responsible way.

Digital infrastructure

13. This should be viewed as a utility. Provision of high speed, ubiquitous access to the internet is essential to the effective operation of a global city such as London, particularly from an economic perspective due to London's deep economic specialisations in finance, creative and digital services. The continued existence of 'not spots' both for residents and businesses across the city, including in its economic centre, suggests that the market is not operating effectively; such obvious market failures require much stronger intervention by the Government, with suitable state aid exemptions negotiated from the European Commission as necessary.

Energy

14. London's energy infrastructure needs to be developed in the most cost effective and sustainable way, with a focus on ensuring security of supply and meeting future demand. The LIP 2050 identified a 20% increase in energy demand can be expected by 2050 (after measures to reduce demand). To respond to this, government must double investment to ensure enough zero carbon energy is supplied to the national grid. We also need to ensure sufficient investment ahead of demand to unlock development sites. One in five of London's substations has less than 2MW spare capacity, however a large commercial development in London can use 8MW – and as such lead times are increasing to get connected. In order to address such issues a stronger policy of allowing investment ahead of need in the electricity infrastructure system is required.
15. Energy efficiency is vital to meeting the UK's climate change targets, and is one of the most cost effective means of reducing CO2 emissions. In tandem with efforts to address supply, such demand-side approaches should be considered as part of the work the National Infrastructure Commission is undertaking. A particular focus of this work should be on addressing the efficiency of London's existing building stock. London has some of the oldest and most energy inefficient building stock in Europe and it is expected that 80% of these buildings will still be standing in 2050. There is a need to retrofit this building stock through means such as insulation to reduce levels of energy consumption. London is already pursuing a number of programmes to address this issue, including the successful retrofit programmes RE:NEW and RE:FIT. Over 113,000 homes and 450 public sector buildings have been retrofitted as part of a Greater London Authority programme with more projects in the pipeline.
16. The inclusion of energy efficiency as a national infrastructure priority is supported by a wide range of stakeholders and businesses, including by the CBI. I hope that you will give consideration to this issue and that London can play its role in delivery an energy efficiency infrastructure programme.

Costing London's infrastructure requirements

17. Work in developing the LIP2050 was underpinned by a comprehensive cost model developed by Arup, which will continue to evolve to reflect changing priorities and assist with prioritisation and spatial planning. The analysis attempted for the first time to understand the magnitude of the full costs of London's infrastructure needs, including that of maintaining or replacing much of the existing asset base.

18. The headline figure from the Arup report is that total required investment in London's infrastructure between 2016 and 2050 will reach £1.3 trillion. Our projections show that London will need to increase its level of expenditure relative to GVA output by some 1.5% to meet its growing infrastructure requirements through to 2050, with costs doubling as a proportion of the economy over the next decade, but declining as a percentage of the economy after 2030.
19. While these estimates are based on an ambitious, policy-compliant scenario (including meeting our housing targets, decarbonising the electricity supply, and securing the necessary investment in transport), they indicate the scale of investment required, and are perhaps not unexpected given the resumption of net population growth after 75 years of no net growth at all.. Housing and transport make up over three quarters of total projected capital expenditure.

Delivering London's infrastructure

20. Work on the Infrastructure Plan highlighted a number of institutional barriers affecting the delivery of London's infrastructure, including split governance across and within sectors, varied regulation and lack of coordination. My setting up of the London Infrastructure Delivery Board was one response to these issues. It is made up of key infrastructure stakeholders in London, including the utilities across the infrastructure sectors (energy, water, digital etc.), as well as business, boroughs, regulators and Government representatives.
21. Some of its recent initiatives have included developing the London Infrastructure Database and Mapping Application, which aims to bring together information from a range of sources to support the planning, joined-up delivery and coordination of infrastructure across the capital. The mapping application identifies planned investments relative to growth and infrastructure capacity – and it provides a strong evidence base to inform future discussions around London's future infrastructure requirements on a spatial level. Other areas of focus of the Delivery Board have included testing best practice delivery in growth areas; and also advocating regulatory reform.

Regulatory challenges

22. The need for regulatory reform to support infrastructure investment is clear. The Mayor is concerned that regulatory frameworks are inhibiting development, innovation and higher levels of efficiencies. Much of London's infrastructure – water, energy, digital; is in the hands of the regulated utilities. The regulations in place successfully protect consumers from unnecessary price rises; however there are some unintended consequences. These include the fact that the Mayor has no direct influence over investment decisions, despite being elected to have strategic oversight of planning in the capital. The London Plan is not a statutory consideration as part of the process of approving business plans by the regulators.
23. In addition, regulations do not support appropriate levels of investment ahead of demand at particular locations where growth is expected to occur (and is occurring). Increased flexibility or new models of delivery are required to secure earlier investment on a more strategic basis. The GLA is committed to working with the regulators to address these issues through bodies like the UK Regulators Network.
24. In view of these issues the GLA is therefore keen to ensure that regulators require the utility providers to have regard, in particular, to the London Plan and its economic and demographic forecasts; that they require utility providers to share their plans as they develop; that they adopt more of a rolling forward planning approach (rather than fixed terms); that they take a much longer term horizon in key sectors like water and energy; that they allow for more investment ahead of demand, with a risk and reward sharing model, so that infrastructure is in

place before development comes rather than afterwards; that they encourage much more open data and sharing of data, including of future activity (via the mapping application above); and that they incentivise innovation.

Funding and financing London's infrastructure requirements

25. When developing the LIP2050, our original estimates of London's infrastructure needs were based on a number of ambitious policy scenarios, including aviation. The Plan determined that the cost of London's future infrastructure requirements are high and a significant funding gap of £135 billion is likely to emerge by 2050 when comparing expected costs against current sources of revenue.
26. To meet this challenge the Mayor has argued for fiscal devolution in order to help London better meet its funding gap. If London controlled more of the tax revenues it generates, it would be better positioned to incentivise growth and address its unique infrastructure challenges. The recent announcement by the Chancellor promising to devolve business rates is an important step forward (and welcomed), but it still is not enough to meet London's future funding challenges. More needs to be done to devolve the full suite of property taxes raised in London as recommended by the London Finance Commission, and enable new local funding mechanisms.
27. New forms of fiscal devolution to better capture value and create self-funding infrastructure schemes such as stamp duty increment zones, VED devolution should be prioritised. Increased devolution would ensure that larger infrastructure schemes could be realised faster through new or increased use of alternative funding mechanisms, such as business rate supplements, tax increment financing and enterprise zones. We have demonstrated successfully through the Northern Line extension and Crossrail the applicability of such funding mechanisms in the London context.
28. Longer term fiscal opportunities may include. London or wider South East payroll taxes or income tax supplements (either in lieu of tax cuts or additional) hypothecated for investment. A recent survey of Londoners found that around 60% of Londoners were willing to pay more income tax by giving up part of a tax cut in return for increased infrastructure investment³. Wales and Scotland, much smaller economies, have such powers on a much greater scale – as do many other cities and regional economies worldwide. London is much more reliant upon national decision making and national spending transfers than comparable cities: for example 74% of GLA and borough expenditure is funded from intergovernmental transfers, compared to equivalent figures of 31% in New York and 18% in Paris⁴.
29. These approaches provide London with increased capacity to address its own needs – enabling new financing and funding mechanisms and improved accountability. It will also remove a layer of the political process in realising infrastructure in the capital, speeding up delivery and approval. Without the funding levers to invest appropriately, the mayor's capacity to invest in infrastructure will be severely constrained.

³ Mayor of London, July 2015 – telephone poll of Londoners

⁴ London First, 2015 'London 2036: an agenda for jobs and growth'.

Greengauge 21 consultation response to National Infrastructure Commission: London's Transport Infrastructure

Greengauge 21 welcomes the opportunity to respond to the National Infrastructure Commission call for evidence.

In the first part of our response, we explain why a strategic framework, currently lacking, is needed to consider investments such as Crossrail 2. We put forward common criteria that we believe should be considered in all major (transport) investment decisions. The second part responds to the specific issues raised in the London's Transport Infrastructure consultation.

(i) The need for a strategic planning framework

The Northern and London transport initiatives are being considered by the NIC against a backdrop of continuing high annual rail demand growth and of major investments in the rail sector (and a substantial highways investment programme too). It is clear that substantial further investment will be necessary.

Our contention is that there is (still) no overall strategic plan or vision for the development of the national rail network. The risk is of failure to plan effectively the many interfaces and potential overlaps between projects, with the attendant dangers such as wasteful or even nugatory expenditure; untenable levels of disruption to services and local communities; and spikes in demand for the supply chain. Crossrail 2 would benefit from a wider rail strategic plan for London and the wider South East.

We recognise the planning work that Government (through DfT), Network Rail and the ORR undertakes to establish 5-year investment programmes for rail. But there is no longer term strategy.

We believe that there needs to be a *rationale* for new project possibilities set at a national level to help form the narrative on the need for such schemes, and to complement the business cases that project promoters (*e.g.* TfL and TfN) will be developing. Under EU law, while the recent precedent with HS2 may suggest otherwise, there is possibly a legal need for a strategic environmental assessment, and the wider strategy we call for could address this need or agenda.

Greengauge 21, through its Public Interest Group formed in 2008, with sponsorship of the English RDAs, Network Rail, TfL and many other public authorities across Britain, created a national strategy for high-speed rail ('Fast Forward', published in September 2009).

With appropriate support from stakeholders, building on its experience with high-speed rail, Greengauge 21 is seeking to develop during 2016 a broader *national rail development strategy*. This will include consideration of high-speed rail, but look more widely, at all forms of rail operation, passenger and freight. It will also consider the important interface between the national network and city region metro systems – a neglected area of study and one which is of particular relevance to Crossrail-style projects – projects which, in general, we believe are a highly effective way of developing the rail network. We would welcome exploring how it can be used to serve the National Infrastructure Commission objectives going forward.

In that work, we plan to develop clear criteria applicable across the nation when considering major rail investment options. We have identified five criteria that we believe the Commission should apply to the Northern and London cases – and indeed to all future transport investments of significant scale. These are:

1. Regional (and city region) economic need
2. Housing growth need
3. Capacity need
4. Implementation sustainability
5. Compatibility (with other projects and with changed circumstances) and sequencing.

The first criterion – regional (and city region) economic need – is straight-forward: there must be spatial plans. London, uniquely, has such a plan for 2050, provided under its statutory obligation from the Greater London Act.

Greengauge 21 considers it is essential that London's plans are kept up-to-date, developed comprehensively, with private sector inputs, so that a contemporary account of economic development outlook is available at all times. Otherwise, transport (and no doubt other) investment can only be considered in a vacuum.

Crossrail One was, in our judgement, ultimately given Government approval to proceed because of the existence of a clear long term expectation on the scale and location of the capital's future population and employment growth. Without wider

plans or frameworks, transport investments risk being distorted towards meeting existing/short term/foreseeable transport network congestion issues or other shortcomings: the investments may still be worthwhile, but they are unlikely to be transformational and will leave open to chance whether wider economic and housing policy objectives are met as fully as they could be.

The existence of long term, spatially defined, growth plans in the London case goes a significant way towards meeting the second criterion (housing growth need). But it also serves to highlight the problem in the surrounding shire counties, where previous regionally-set housing growth targets have been squandered. Planning Crossrail 2, for example, which is said to 'connect Surrey with Hertfordshire', is hindered by the lack of longer term quantified and spatially-based plans for these counties. Greengauge 21 urges the Commission to call for this lack to be made good. The Commission is well-placed to consider questions like overheating of the housing market in London/Southeast (and the apparent lack of demand across much of the North).

The third criterion – capacity – needs to be driven by a range of demand growth scenarios which include a continuation of recent trends as well as the lower, more cautious forecasts used by DfT.

Consideration needs to be given to *what if* scenarios, rather than a single central demand forecast (including the effects of policy or technology shifts; funding availability and implementation slippages; market trend inflections). This should include thinking about *flexibilities* with operating pattern assumptions and hence wider outcomes.

There is a particular gap presently in the area of freight forecasts where major revisions are needed to take into account the possible impacts of port developments – especially Thames Gateway – and the emerging markets for rail in meeting domestic logistics and distribution network needs, including into urban centres.

And when considering capacity, the closely related area of punctuality performance needs to be addressed as well. There are often non-infrastructure solutions to capacity problems that are appealing for cost reasons but leave the network – which is already busy – overloaded and subject to poor punctuality performance.

The fourth criterion – implementation sustainability – is intended to help guide the nature or version of specific interventions and projects, applicable on a consistent basis across the nation. It has three distinct components:

- The ability of the region/corridor served to sustain any adverse environmental impacts, and specifically, the loss of land currently not used for transport;
- The likely impact on land use development, summarised on a single dimension of inducement towards densification/intensification of existing developed/formerly developed ('brownfield') land at one end of the axis and new development ('greenfield') and dispersion/sprawl at the other end; this is a key indicator for wider carbon/energy outcomes;
- The ability of the region's/corridor/s transport system to sustain economic objectives during periods of disruptive construction.

In effect, work in this area should help guide the type of investment needed: whether it would be better to upgrade existing or to go for new build; to serve existing urban developments or foster and encourage new settlements; to propose new transport infrastructure at-grade or in tunnel, and so on.

The fifth criterion – compatibility and sequencing is often missing from project-specific appraisals and gateway reviews. Applicable at project level, a compatibility matrix for Crossrail 2 covering rail investments is shown below. There is a high level of complementarity, with some other projects representing real opportunities for integrated designs and cost savings – in particular, the planned upgrades for the South West, Brighton and East Coast Main Lines as well as the possible DLR extension from Bank to Euston and plans to connect Stansted better with central London (which could be achieved with a Lea Valley upgrade scheme or with a totally new alignment – the latter having the potential to address wider issues such as ECML capacity).

Many projects are complementary and some would feed traffic onto Crossrail 2. Long term plans to increase tube line capacity (e.g. the Piccadilly Line) may, on the other hand, have an adverse impact on the business case of Crossrail 2 and the Thameslink project and other plans to improve Stansted connections could substitute in part for Crossrail 2 (but equally, with care, could act as good complements too).

Other project interfaces we judge most likely to be overlooked that represent real opportunities that could be precluded (or made costlier) by Crossrail 2 implementation include the outline plans for an outer London orbital railway in the London 2050 Plan (the scheme shown uses the same railway between New Malden and Teddington as Crossrail 2), and the DLR extension to Euston where an integrated station design could bring wider benefits to both projects.

Crossrail 2 Compatibility Matrix

COMPLEMENTARITY				PROJECT	OVERLAP	
Integrated design opportunity = ££ saving	One project feeds the other	Precursor project, builds market for Crossrail 2	Independent		Partial substitute, so business case impact	Clear alternative
▪		▪		SW Main Line Upgrade	▪	
▪				Brighton ML Upgrade		
▪				ECML Upgrade		
			▪	GEML Upgrade		
▪	▪			DLR Euston Ext		
				Tube capacity	▪	
			▪	Northern Line Ext		
			▪	Croydon Tramlink devt		
	▪			London 2050 plan orbital rail		
	▪			LHR southern access		
	▪			HS2		
▪				Stansted Express & Lea Valley scheme		▪
▪			▪	Crossrail 1 Extensions		
				Thameslink	▪	

The related question of sequencing is not the same as phasing. It concerns questions of what actions/investments are precursors for others and what might be precluded subsequently by early decisions, as well as optimum timings. It is crucial to thinking about strategic fit and meeting one of the criteria that Sir David Higgins identified for HS2: standing the test of time.

(ii) London's Transport Infrastructure

Developing London's transport infrastructure has involved lengthy timescales, and in some cases policy reversals: the abandonment of the 'Northern Heights' underground line extensions in the 1940s and the partial implementation of the London ring motorway schemes in the 1973 Greater London Development Plan before their abandonment serve as lasting examples.

Lengthy planning timescales allowed schemes such as the Victoria Line (1960s) to be designed to achieve key customer benefits such as the cross-platform interchange between the Victoria and Bakerloo lines at Oxford Circus. Subsequent tube developments have been less satisfactory, requiring level changes for transferring passengers at interchanges that have become much costlier to construct.

For rail, there have been broadly three types of development:

- Those initiated by London Transport/TfL – and the seminal (but very rapidly carried out) Central London Rail Study of 1988 (the clue to much of what followed in terms of the specification of Crossrails 1 and 2 is in the word *central*)
- Projects designed to get more out of existing infrastructure, and London underground has now built an excellent track record in increasing capacity with higher service frequencies, alongside station by station measures to increase access/interchange flow capacities; also in this category would be the London Overground
- Other rail developments not initiated by London Transport/TfL – and these have included the DLR, Croydon Tramlink, the Croyley Link (now re-labelled the Metropolitan Line Extension). Interestingly, these are schemes largely outside central London. The Jubilee Line and Northern Line Extensions were both initiated by property developers. But all of these projects have ended up under TfL's overall management (including in most cases through the construction phase).

There has been no successor to the Central London Rail Study carried out 27 years ago, nor any comprehensive plan for developing London's rail network across inner and outer London. So there is a planning vacuum around Crossrail 2.

The sequence of events with Crossrail 1 implementation is relevant. It had been selected as the priority from the various Central London Rail Study (CLRS) schemes

but its Parliamentary Bill was thrown out in 1994. A subsequent study led by the Strategic Rail Authority in 2001 examined the need for investment (The London East West Study (LEWS)), and this studied a wide range of options and considered the needs of freight traffic, for example, as well as passengers. No equivalent study has been carried out for Crossrail 2; its selection is based on the now ancient CLRS study, where it came in second. Crossrail 1 was revised following LEWS to include an alignment serving Whitechapel and Canary Wharf – and the earlier objections from London Borough of Tower Hamlets that had stopped the 1994 Bill did not recur.

In terms of the road network, there has been a continuing erosion of network capacity for vehicles attributable to local demand management measures, and better provision for cycling and pedestrians. Vehicular travel speeds have declined in all parts of London over the last ten years as a result, even with static and slightly falling traffic volumes.

The review led by Deputy Mayor Isabel Dedring in 2013 identified the potential role of tunnelled roads and a possible inner ring scheme was published in May 2014¹. Because of the high levels of suppressed demand, any increases in road network capability for vehicular traffic will be self-defeating as a means to tackle road congestion; road user charges or tolls would need to be considered; price levels would have to be punitive. In short, it is not realistic to plan on expanding the road network to add general vehicular traffic capacity. On the other hand, there is strong demand for additional space to be set aside as public realm; there is a very critical need to achieve gains in air quality (so pedestrianisation of Oxford Street should be a priority, especially given the access gains that Crossrail 1 brings²); and there is a need to accommodate buses, service vehicles and emergency services with a much reduced risk of delay from congestion.

This suggests that tunnelled road schemes with these wider user objectives should be developed – but explicitly not as a means to increase general road traffic capacity.

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

The problems of success – a prospering city, with economic strengths not just in financial/business/professional services, but also in creative/digital media and culture, in tourism, retail, in Government, in law/justice, in research and learning.

¹ <https://tfl.gov.uk/corporate/publications-and-reports/roads-task-force>

² See West End Commission, final report April 2013 www.westendcommission.com/Report.html

With high population growth, in both London and the surrounding regions (Southeast and East of England), there are challenges to provide sufficient new housing and associated social infrastructure (schools, parks/leisure facilities, hospitals) at affordable prices.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

Road investment needs to be directed towards meeting the needs of many distinct user groups: pedestrians, cyclists, buses/trams, servicing vehicles (including to construction sites) and emergency vehicles.

Rail investment needs to address the capacity challenges identified by Network Rail, including on several major radial lines³; efficiently to cross-link radial lines; to create a limited set of orbital rail routes that convert the radial routes into a part of a broader network capability; to respond to major development opportunities as they arise in the manner of JLE and NLE; to continue the programme of station capacity enhancement and LU line capacity upgrades; to respond to the access needs of major long distance terminals (HSR and airports); to provide for cross London railfreight and railfreight terminals.

- *How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?*

Against the 5 criteria identified above and by reference to business case and benefit:cost performance.

- *What might their potential impact be on employment, productivity and housing supply in London and the southeast?*

These investments are hugely important to employment and productivity. They might have little useful impact on housing supply/prices: transport enhancement tends to drive up property values and hence prices. But planned in conjunction with new measures to achieve residential densification and to serve large scale new

³ London and South East Route Utilisation Study 2011 see [www.networkrail.co.uk/.../route%20Utilisation%20strategies/.../london%](http://www.networkrail.co.uk/.../route%20Utilisation%20strategies/.../london%20) and www.networkrail.co.uk/...studies/london-and-south-east-market-study.pdf of 2013.

developments with 'transit-oriented development', rail investments could be made supportive of the housing supply objective too.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

The *benefits* of Crossrail 2 can be increased by:

1. Ensuring it provides sufficient capacity relief to major national rail routes so that other parallel major rail investments are not needed
2. Cross-linking its branches, such as Kingston – Epsom (which will otherwise be under-utilised with perhaps only 4 trains/h) to provide part of the orbital network (and failing to do this may well preclude creating a highly valuable orbital rail system)
3. Increasing planned service frequencies to 40 trains/h. This requires full automation, but this is the norm with new metro systems.

To expand on the first point. Crossrail 2, suitably adapted, could provide for transformations of the South West and East Coast Main Lines (SWML and ECML). The four track route into Waterloo (SWML) has sufficient demand (peak passengers routinely stand for over 60 miles) to require one pair of tracks to offer a non-stop route into Waterloo, with the other pair of tracks accommodating limited stop outer suburban services to provide high frequency interchange at the key nodes along the route in London (Wimbledon, Clapham Junction and Vauxhall). The current Crossrail 2 plan will unfortunately preclude this by leaving a need also to serve Earlsfield – a location that needs to be served by Crossrail 2 running on its own tracks. It would still be possible to serve Balham and relieve the Northern Line, but this should be a separate branch, suitably extended to serve the Streatham area.

At the other end of the route, the ECML will be paralleled by Crossrail 2, but not over sufficient distance to obviate the need to operate duplicate suburban services, wasting line capacity and precluding the expansion of longer distance (and high-speed services) on the ECML corridor without building a new pair of tracks (in the style of the HS2 approach to central London). Crossrail 2 should be extended (on its own tracks) to Welwyn Garden City accordingly. A second branch should run eastwards to serve the opportunity areas along the Thames.

Costs can be reduced by adopting technology closer to that used on DLR, allowing where needed, for greater flexibility of alignment, and with 40 trains/h, potentially somewhat shorter trains and therefore lower cost stations (a combination that also

reduces the risk of station overcrowding and the need to provide for it). Unnecessary or unwanted stations (such as at Chelsea) can be avoided and faster journey times and shorter (lower cost) alignments can be selected (at least in this instance).

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

- *What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?*
- *What innovative funding mechanisms could be considered to support delivery of key schemes?*

A levy should be placed on all property in London, residential and business, to fund transport investment. Together this should provide at least 33% of the funding of projects like Crossrail 2 – with extensions into the line catchments in surrounding shire counties. Another third should come from operating profit (that is revenues less operating costs). Ticket prices will have to remain high – partly because of demand management issues – but more discounting should be available to younger residents who cannot afford the fares, from 18 to 25/30 and maybe even 40 years age groups. Government should fund the balancing third: its returns will be huge (including in enhanced tax revenues).

For road schemes, the Congestion Charge needs to be overhauled and extended to the M25. In London the road system is the one transport network which does not cover its routine costs. Use of the network by the innovative forms of service providers such as Uber and car clubs needs to be addressed separately from the regular pay-as-you go/daily tariff.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

A useful source on this subject is now a little out of date but remains reasonably comprehensive.⁴ Some cities (e.g. Oslo) have since used road tolling to fund public transport schemes.

⁴ Transport 2000 (now CBT): Financing Public Transport: How does Britain Compare? 1992

Response to the National Infrastructure Commission Call for Evidence on London's transport needs from the Royal Borough of Greenwich Conservative Council Group

January 2016

1. Executive summary

- 1.1. The Greenwich Conservative Council Group welcomes this opportunity to contribute evidence to the National Infrastructure Commission's Call for Evidence on London's transport needs.
- 1.2. We have responded to the questions laid out in the call for evidence from our perspective as a Group of (opposition) councillors representing residents in the Royal Borough of Greenwich. Our response naturally focuses on South East London.
- 1.3. Any queries about this response should be directed to Councillor Matt Clare, Greenwich Conservatives Transport Spokesperson at [email redacted]

2. Question (1): What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

- 2.1. Over the next 10 years alone 80,000 new homes will be built in the 5 most South Easterly London boroughs.
- 2.2. Large-scale building will continue beyond the current 10 year targets of 80,000 new homes. Moreover significant home building is underway further out from London on already crowded commuter routes which are shared by residents of the five South East London boroughs.
- 2.3. With efforts to shift commuters from car to public transport the already overcrowded Southeastern trains commuter routes from Kent via South East London will not cope with increased passenger volumes unless significant capacity is added and alternatives such as cycling and buses maximised.

Road capacity in Southeast London is considerably less than in North London and already overcrowded. The Silvertown tunnel, of which we are supportive in principle, will go some way to address this. However clearly the roads are at capacity with there being no option to build further. This further reinforces the arguments in favour of significant improvements to public transport in South East London.

3. Question (2): What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

3.1. **The Bakerloo Line extension from Elephant & Castle to New Cross Gate, Lewisham and onward to Catford & Hayes via an existing National Rail line is essential** to help address the challenges described above.

3.2. The Bakerloo line extension will provide

- an additional high frequency public transport route from very high population growth areas such as Catford, Lewisham and the Old Kent Road to Central London
- a freeing up of line capacity on already overcrowded regional train routes from Dartford via Sidcup and Bexleyheath as well as from Orpington on the Lewisham to London terminii stretch
- a high frequency 'turn up and go' tube service to central London from Hayes, Catford and beyond to replace infrequent trains

3.3. The Bakerloo line extension will also deliver excellent value for money. At approx £2.5bn the proposed Bakerloo Line extension represents only around 15% of the cost of Crossrail 2, but will serve heavily populated relatively central London areas not currently on the tube/train at all (e.g Old Kent Road, Camberwell)

3.4. It is worth noting that this extension was first considered in the 1930s and again in the 1950s and 1970s, long before the volumes of traffic and commuting by train we see today. Due to its currently very central terminus the Bakerloo line is seemingly the only rail line in London which has the capacity to cope with an extension like that proposed above.

3.5. **We also support the proposed London Overground extension from Barking Riverside to Abbey Wood.**

3.6. The London Overground is being extended from Barking to Barking Riverside. Continuing south eastwards to include Thamesmead and Abbey Wood would

bring significant further employment opportunities to residents on both sides of the river.

- 3.7. It is worth noting that with its 50,000 residents Thamesmead is the largest area of London to not be served by tube or rail at all.
- 3.8. **We believe that cycling infrastructure must see significant investment in South East London.**
- 3.9. South East London remains under served by public transport compared to other parts of London. Unfortunately commuting by bike is not yet as attractive an option in South East London as it is from other areas of London which are a comparable distance from the centre such as Newham, Wandsworth or Merton. This is largely due to a lack of safe segregated cycling routes.
- 3.10. The Old Kent Road, Central Lewisham and Lee High Road in particular are considered dangerous and a barrier to many people commuting to work on a bike.
- 3.11. The approved CS4 and CS5 routes will go along way to achieving this. However further extensions outwards should be considered (for example, to Plumstead and Eltham) as well as additional alternative routes. These should only continue with the consent of residents, including all types of road users, and so proper consultation with the public is essential.
- 3.12. **Crucially, the highly successful TfL/Santander Cycle Hire Scheme must be extended into South East London** in the same way that it has been to East, West and South West London all of which already enjoy far better public transport connections.
- 3.13. Extending TfL cycle hire into South East London will give more resilience to the transport network and reduce reliance on cars and buses for shorter journeys.
- 3.14. Greenwich Conservatives are already campaigning for an expansion of TfL cycle hire into Greenwich via the foot tunnels from Island Gardens, including lobbying the Labour administration of Greenwich Council to make a pro-active case to Transport for London, which it has so far failed to do.
- 3.15. It is estimated that a few docking stations could be delivered for around the cost of a brand-new double-decker bus. Contrast this with that bus which travels from point A to point B via predetermined stops and is only available at the point the bus finds itself on that route at any one time. Investing in Santander cycles gives docking stations and bikes which are available at scattered points and can be ridden at flexible times to any one of 750 docking points across London.

4. (Question 3): How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?

4.1. Given the already overcrowded and inadequate public transport in South East London (See PTAL ratings) we strongly believe that the Bakerloo line extension must be prioritised. The Bakerloo line extension can be delivered for only around 15% of the cost of Crossrail 2.

5. (Question 4): What might their potential impact be on employment, productivity and housing supply in London and the southeast?

5.1. Each of the above three projects will bring residents of South East London (old and new) within reach of more employment opportunities.

5.2. Faster, more reliable train and tube journeys into central London will be key to London remaining productive. Already with current volumes of commuters Southeastern trains are frequently delayed resulting in regular productivity losses for London businesses.



Eurotunnel submission to the National Infrastructure Commission consultation – London

Eurotunnel welcomes the opportunity to respond to this consultation, having long been aware of the need to ensure that infrastructure projects in the UK are delivered rapidly in order to support economic growth.

Overview

Groupe Eurotunnel (GET) manages and operates the Channel Tunnel Fixed Link between Britain and France, providing the infrastructure for Eurotunnel's own Shuttle services, international freight and high speed passenger trains. Completed in 1994, the Tunnel was financed entirely from private sources at no cost to the taxpayer.

GET also operates GB Railfreight, as the British arm of its Europorte rail freight brand. Acquired by Europorte in 2010, the business operates a variety of services including bulk traffic, biomass, coal steel, petrochemicals and metals transportation. GB Railfreight prides itself on its innovative approach to railfreight which has seen it win a number of rail industry awards and earn the standing as Britain's most reliable freight operator.

Maintaining effective transport links throughout the UK is crucial to ensuring economic prosperity. This allows businesses in London to transport their products throughout Britain and beyond, and also ensures that the Capital is supplied with the goods it requires.

Response

As the operator of the Channel Tunnel, GET provides crucial infrastructure for the transport of goods to and from mainland Europe. The opening of the Channel Tunnel revolutionised the UK's accessibility to the European market, which can be reached faster and more reliably than at any time.

The UK economy directly benefits from the mature fixed link to mainland Europe. Key industry sectors have built import and export business models that are only viable because of the Tunnel. For example the automotive industry can transport time sensitive components; fish from Scotland and meat from Ireland can build key export markets across Europe. Prior to the Tunnel there was no economically sustainable business model to facilitate the UK's full participation in this trading revolution.

To support London's growth through more effective access to European markets, additional highways capacity crossing the Thames to the east of London is required. This can be delivered through the proposed Lower Thames Crossing which will support economic growth and release pressure on central London crossings such as the Blackwall Tunnel. In addition, new capacity for rail freight is required through Kent, to link businesses in London to the continental market, as set out below.

South East road highways capacity and Operation Stack

However, this summer saw access to the Tunnel limited by a combination of migrant incursions and striking ferry workers. Operation Stack was enforced for 28 days and during this time British manufacturers all over the country were placed under intense pressure. The goods transferred via the Tunnel tend to be high value components for the automotive, electronics, pharmaceutical industries, fresh produce and rapid courier services, and delays in their transportation result in large costs for business throughout the UK.



Although Operation Stack has not been in force since then, the events of the summer highlighted the need to increase the resilience of road networks in the South East. The road network in Kent is vital for connecting the south of England to the Capital. With a predicted increase in truck traffic of 30% in the next five years, there is a clear need for a solution to Operation Stack and additional capacity in Kent and the South East road network. In order to maximise economic growth across the country we must keep vehicles moving. This requires long term solutions such as: adding capacity to the M20; upgrading the A2 to motorway standard; providing additional capacity across the Thames through a new Lower Thames Crossing (as noted below); and consideration of modal shift to rail freight. These changes would ensure that products made throughout the UK are more likely to be successfully transported to Europe, than the current situation where Operation Stack is enforced.

This requires long term solutions such as adding capacity to the M20, upgrading the A2 to motorway standard and also consideration of modal shift to rail freight. These changes would ensure that products made in London can be successfully transported to Europe without costly delays, and businesses in London will receive the products they need to serve their customers.

Rail freight capacity

Another opportunity for addressing congestion on the roads in the South East and to ensure greater security for time sensitive deliveries would be for the Government to invest in the creation of greater rail freight capacity across the UK.

This will encourage a modal shift from road to rail, taking lorries off the road network, releasing capacity for other vehicles and increasing the reliability of those companies using rail freight for deliveries. There would also be well-documented environmental benefits delivered by this modal shift.

The Government has committed to deliver additional freight capacity, but action needs to be taken, in particular:

- Implementing and funding the proposed European Rail Freight Corridor from Europe to London to ensure swift rail access to foreign markets.
- Completing the Kent Gauge Study proposed by Network Rail and upgrading freight routes through the county which link the Channel Tunnel to London and the wider UK.
- Investigating and delivering improvements to the network beyond London, so that businesses in the Midlands and North of England benefit from rapid rail freight access to European markets and routes to the Capital. This includes identifying and delivering capacity improvements on key rail arteries such as the West Coast and East Coast Main Lines.

Lower Thames Crossing

Finally, addressing capacity on crossings across the Thames through the creation of a Lower Thames Crossing is also crucial for ensuring prosperity. A new crossing would relieve congestion on the routes from the South East into London, allowing businesses to transport their produce in good time and smoothing traffic flows into the Channel Tunnel.



Upgrading the local Kent road network, increasing rail freight capacity, and constructing a Lower Thames Crossing would benefit London businesses by improving their ability to connect to mainland Europe and reducing delays which cause their products to lose value. Additionally, an improved road network would reinvigorate local development in the South East by creating jobs in the area, and stimulating investment as businesses become more confident that there is a reliable transportation network.

Contact:

John Keefe, Groupe Eurotunnel
[email and telephone number redacted]

Serena Balachandra, Lexington Communications
[email and telephone number redacted]



The Conservative Group
London Borough of Hammersmith & Fulham

Via email

5 January 2016

Dear Ms Dix,

Response to the Crossrail 2 consultation

As the Conservative Councillors for the London Borough of Hammersmith & Fulham, we are writing in support of a Crossrail 2 interchange at Imperial Wharf.

Last month, the TfL Commissioner, Mike Brown, assured Greg Hands MP that Imperial Wharf is “being seriously considered” as an alternative station site. This new approach is encouraging. We believe that Imperial Wharf would serve more commuters, support more new jobs and homes, offer better value and – perhaps as importantly – gain support across our borough and west Chelsea.

Imperial Wharf has significant advantages over the current plans for a station at the eastern end of the King’s Road:

Interchange – Imperial Wharf would form the main Crossrail 2 interchange with the West London Line, reducing journey times for passengers. Without a separate interchange, Clapham Junction is likely to face severe station capacity problems, because it will also handle new demand from dozens of mainline routes. The interchange would also remove pressure on Overground services at the existing Imperial Wharf station, while relieving pressure on the District Line at West Brompton, Fulham Broadway and Parson’s Green.

Passengers – based on its current catchment area alone, more commuters would use a Crossrail 2 station at Imperial Wharf. This number rises when new development is anticipated. It rises again when new bus routes in south Fulham are considered, as there would be substantial demand for improved links under Crossrail. When passengers transferring from the Overground are added, the commuter case for Imperial Wharf becomes overwhelming.

Alignment – a natural alignment from Imperial Wharf (through Clapham Junction) to Balham would not involve tight curves. Changing the orientation of the track through Clapham Junction would therefore result in faster journeys, an equivalent track length and lower maintenance costs than under the current plans. We also welcome TfL’s acknowledgement that the foundations of the riverfront buildings are navigable. There is no engineering barrier to a Crossrail 2 station at Imperial Wharf.

Cost – land values around Imperial Wharf are cheaper, with the ability to redevelop a brownfield site to offset the cost of the station. The Lots Road Car Pound site would allow a significant capital receipt from new housing, as well as a station entrance in Chelsea. There is also the possibility of s.106 contributions from neighbouring sites that are due for redevelopment. Together, these factors suggest a significantly lower cost for an Imperial Wharf interchange than building a King's Road station with no associated redevelopment.

Olympia – District Line services to Olympia have been a recurrent issue for residents, for the exhibition halls, and for solving the bottleneck at Earls Court. A Crossrail 2 interchange just two Overground stops away at Imperial Wharf would finally provide a solution, particularly when combined with more frequent Overground services. Likewise, Imperial Wharf would provide a real alternative for many more passengers at West Brompton, which faces growing pressure from new development.

Regeneration – a key aim of the Crossrail 2 project is to unlock more jobs and homes, assisting in London's regeneration. There are several major redevelopment sites around Imperial Wharf, all of which are poorly served in terms of public transport links to central London. This has hampered their progress. A Crossrail 2 interchange would spur substantial investment and create new employment around the station. By contrast, no significant development sites in Chelsea would be unlocked through the current plans.

Support – unlike the plans for a King's Road station, there is unequivocal local support for bringing Crossrail 2 to Imperial Wharf. It would benefit thousands of commuters in Fulham, both directly and by relieving pressure on the District Line. It would still benefit thousands of commuters in Chelsea, with greater benefits for the poorly connected areas around World's End and Lots Road. It would also offer benefits along the rest of the West London Line. Local residents consistently tell us that they want Crossrail 2 to serve our area.

An Imperial Wharf interchange is compatible with the original conception of a Chelsea-to-Hackney line, which for many years included safeguarded land in Fulham. It would allow a station entrance in Chelsea, on Lots Road, and others serving Chelsea Creek, Chelsea Harbour and Imperial Wharf. At the same time, it would enable Crossrail 2 to be cheaper, faster, serve more passengers and tackle overcrowding at multiple stations, while delivering the regeneration always intended.

Given these advantages, it was frustrating to see many inaccuracies and omissions in the report provided to Greg Hands MP in October. We hope that you will now commit to undertaking a proper technical study of the Imperial Wharf option, which will provide a credible basis for assessing passenger numbers, cost, regeneration potential, journey times, station alignments, tunnel routes, shaft locations, Overground usage and the impact on other stations and lines.

In administration, we urged the case for an Imperial Wharf interchange during TfL's consultation process in 2013. Given the new Commissioner's openness to rethinking the plans, we strongly urge the case again. It is a far better option than the King's Road.

We would welcome an opportunity to meet in person to discuss an Imperial Wharf station on behalf of our residents.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'G Smith', with a stylized flourish at the end.

Councillor Greg Smith
Leader of the Opposition

Councillor Steve Hamilton

Councillor Robert Largan

Councillor Jane Law

Sands End Councillors (for Imperial Wharf)

Councillor Michael Adam

Councillor Adronie Alford

Councillor Nick Botterill

Councillor Andrew Brown

Councillor Joe Carlebach

Councillor Charlie Dewhurst

Councillor Belinda Donovan

Councillor Caroline Ffiske

Councillor Marcus Ginn

Councillor Lucy Ivimy

Councillor Donald Johnson

Councillor Alex Karmel

Councillor Mark Loveday

Councillor Viya Nsumbu

Councillor Harry Phibbs

Councillor Frances Stainton

Executive Summary

Heathrow Airport Limited congratulates the Chancellor on establishing a much needed and independent National Infrastructure Commission to provide unbiased assessments of the UK's long-term infrastructure needs. Heathrow also looks forward to the Commission's commitment to monitor the Government and industry's progress in meeting these needs, because it is critical national interests are not thwarted by local political interests.

As the European Commission noted in its recent Aviation Strategy, connectivity and infrastructure – and as Heathrow's submission will outline, strategic connectivity to airports – are critical to the UK because 'studies show that the better a city, region or country is connected by air to other destinations in Europe and other parts of the world, the more growth can be generated.' The European Commission's new Strategy also recognises aviation and airports as 'strong drivers of economic growth, jobs, trade and mobility for the European Union' and hence why improving connectivity has been listed as one of the Commission's three key priorities.

The fact that connectivity has been outlined as a priority in the European Commission's new Aviation Strategy also validates the important role connectivity and infrastructure play in the UK economy and why the independent National Infrastructure Commission's work is so important. The Commission should note that it is not just city-to-city connectivity that could address connectivity weaknesses, but also strategic city-to-airport connectivity.

For example, limited and indirect rail and air links between the North and Heathrow Airport are holding back the growth of northern city regions because 'the world's economic centre of gravity has shifted towards Asia.'¹ Heathrow offers more direct and frequent flights to Asia because it is a hub airport. As a hub, Heathrow is different to other UK airports, because it can pool international, continental, domestic and local demand for leisure and business passengers as well as air freight, making direct flights to more cities around the world, particularly emerging markets, more commercially viable for airlines. It is critical that northern cities are well connected to Asia and the most viable way to do this for the UK economy is with better connectivity to Heathrow Airport.

That said the UK's regional airports still play an important role in connecting regional city regions, but they play a different role to Heathrow. For example, this submission demonstrates how as a hub, Heathrow plays a significant and different role to other airports in the country's freight connectivity. Heathrow is the most important freight airport in the UK, moving more cargo than all other UK airports combined (CAA, UK Airport Freight Data, 1990 – 2014²). This confirms the importance of connectivity (rail and domestic air links) to Heathrow for exporters in the North and indeed around the country.

While the Commission is not looking at airport capacity, it is important that the Commission notes the added benefits to the UK and the freight community when prioritising infrastructure projects and the added benefits that connectivity can bring.

As mentioned previously, with the global shift to Asia, London – and the UK's – status and its continuing success as a global centre for business is critically dependent on the quality of its international connectivity, as well as its local transport infrastructure. London is expected to see major population growth, but it is in competition with other cities around the world, so investing in London's transport infrastructure and connectivity to its only hub airport is key to maintaining its competitive edge and status as a leading global city for its residents, businesses, international investors, exporters, students and tourists.

¹ The European Commission, Aviation Strategy for Europe, December 2015

² <http://www.caa.co.uk/Data-and-analysis/UK-aviation-market/Airports/Datasets/UK-Airport-data/Airport-data-1990-onwards/>

About Heathrow

Heathrow Airport Limited owns and runs Heathrow Airport – the UK’s only hub airport. In 2014 73.4 million passengers and 1.50 million tonnes of freight passed through the airport – worth £101bn in value, making Heathrow the UK’s biggest port by value.

Heathrow is one of the UK’s largest transport hubs with the UK’s only dedicated non-stop express airport rail link, free travel zone, the UK’s busiest bus and coach station and the only airport served by London Underground, with four stations. Over the last 20 years passenger numbers have risen by almost 80% and yet airport related road traffic has remained broadly static. The number of passengers using public transport every year has nearly doubled from 10 million to 19 million and the proportion of our colleagues driving to work alone has fallen from 8 in 10 to just 5 in 10.

Introduction

Heathrow is submitting evidence to the National Infrastructure Commission’s call for evidence because we believe there is opportunity for the Government to prioritise certain infrastructure projects, particularly rail and domestic air links to the UK’s only hub airport – Heathrow – to benefit passengers, businesses, the environment and the UK’s economy not only in the north, but also for the rest of the UK and Greater London.

While this call for evidence is not looking at airport capacity or air quality issues, **strategic and sustainable connectivity to airports** – particularly the UK’s only hub airport, Heathrow – are areas of infrastructure that we believe the Government should prioritise to improve all of the UK’s connectivity, economic growth and maintaining London’s status as a leading global city.

1. Connecting northern cities

1. *To what extent are weaknesses in transport connectivity holding back northern city regions (specifically in terms of jobs, enterprise creation and growth, and housing)?*

Limited and indirect rail and air links between the North and Heathrow Airport are holding back the growth of northern city regions because ‘the world’s economic centre of gravity has shifted towards Asia.’³ Heathrow offers more direct and frequent flights to Asia because it is a hub airport. As a hub, Heathrow is different to other UK airports, because it can pool international, continental, domestic and local demand for leisure and business passengers as well as air freight, making direct flights to more cities around the world, particularly emerging markets, more commercially viable for airlines. It is critical that northern cities are well connected to Asia and the most viable way to do this is with better connectivity to Heathrow Airport.

While the National Infrastructure Commission is not looking at airport capacity, it is important the Commission notes the GDP and job benefits (outlined below) that an expanded Heathrow could bring northern city regions and the additional benefits that links to other infrastructure projects could also bring the North, for example linking HS2 and Crossrail 2 to Heathrow for northern passengers.

The independent Airports Commission produced an assessment of the economic benefits that would arise from airport expansion in terms of jobs and GDP (in Net Present Value). It also produced a broad breakdown of where in the UK the overall GDP increase effects will arise. These are presented for three broad regions (London & South East; Rest of England; and Rest of UK) for the scenario it defines as “Assessment of Need.”

Table 1: Present Value of regional real GDP impacts – Assessment of Need Scenario⁴

³ The European Commission, Aviation Strategy for Europe, December 2015

⁴ Source: Airports Commission, “Economy: Wider Impacts Assessment” Tables 18 & 36

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	Heathrow
London & South East	39.83%
Rest of England	43.78%
Rest of UK	16.39%

Source: Airports Commission, "Economy: Wider Impacts Assessment" Tables 18 & 36

Heathrow then commissioned Quod to do a further breakdown of the Airports Commission's work to UK regions and converted the results to jobs based on GDP per worker. The Airports Commission estimates that the Heathrow North West Runway option would create an additional 179,800 jobs by 2050 under the Assessment of Need scenario. The estimated regional breakdown is as follows:

Table 2: Regional breakdown of jobs based on GDP per worker, controlled to AC estimates

	Heathrow	Gatwick
London	38,500	9,300
South East	33,200	8,000
London & South East	71,700	17,200
Yorkshire & Humber	11,300	3,500
North West	15,300	4,800
North East	5,100	1,600
East	12,900	4,100
East Midlands	9,800	3,100
West Midlands	12,000	3,800
South West	12,300	3,900
Rest of England	78,800	24,800
Scotland	16,100	4,100
Wales	8,400	2,200
Northern Ireland	5,000	1,300
Rest of UK	29,500	7,600
TOTAL	179,800	49,600

This table demonstrates the job benefits Heathrow expansion will bring northern cities and the significantly more jobs Heathrow expansion will bring the North compared to Gatwick. The difference in job numbers between expanding Heathrow versus Gatwick is attributed to the increase in manufacturing jobs and Heathrow is one of the UK's most significant ports, moving the most freight by value in the UK. Heathrow is also the most important freight airport in the UK, moving more cargo than all other UK airports combined. In 2014 Heathrow moved nearly 1.5 million tonnes; followed by East Midlands International at 277,413 tonnes; Stansted 204,725 tonnes; Manchester 93,466 tonnes and Gatwick moving 88,508 tonnes. In terms of other northern cities, in 2014, 5,119 tonnes moved through Birmingham; 4,450 tonnes through Newcastle and 236 tonnes at Liverpool (CAA, UK Airport Freight Data, 1990 – 2014⁵, Refer to APPENDICES A & B). This demonstrates the importance of connectivity (rail and domestic flight links) to Heathrow for exporters in the North and indeed around the country.

⁵ <http://www.caa.co.uk/Data-and-analysis/UK-aviation-market/Airports/Datasets/UK-Airport-data/Airport-data-1990-onwards/>

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Again, while the Commission is not looking at airport capacity, it is important that the Commission notes the added benefits to the freight community when prioritising infrastructure projects, such as rail links to Heathrow, which generally brings significantly more benefits than any other airport.

HS2 provided a unique opportunity to deliver a properly integrated transport system with a direct connection to Heathrow. This could have been key to delivering benefits for passengers and achieving Government objectives for more sustainable travel, improving domestic and international connectivity, economic growth and carbon reduction. The Government initially supported a direct link to Heathrow on the basis that it would:

- a. Significantly enhance its accessibility by rail from the Midlands and the North;
- b. Provide new opportunities for growth and investment in those regions;
- c. Create a multi-modal transport 'hub' at the airport;
- d. Ensure that HS2 passengers would not have to change trains to access Heathrow;
- e. Incentivise further surface access investment at Heathrow; and
- f. Yield benefits right across the country.

However, the Government subsequently abandoned the proposals for a spur to Heathrow in early 2015, primarily on the basis that this was not considered necessary to support Heathrow's expansion. This unexpected decision represented a significant blow to regions in the Midlands and the North that could have benefited from direct rail connectivity to Heathrow, particularly where many domestic/ regional air connections have been lost. This is an example of how northern city regions will be disadvantaged through our inability to properly plan our major high speed rail network, despite some very clear strategic benefits. In the absence of a spur, a high quality interchange at Old Oak Common is essential.

Heathrow is currently the best connected airport by road in England. Based on ONS connectivity work, over 7m people have Heathrow as the airport with the shortest journey time by road. For Birmingham, London City and Manchester this figure is below 5.5m. For public transport, Heathrow is the airport with the quickest journey time for around 5.8m people. As you can see, there is a gap of more than a million people for whom Heathrow is the shortest journey by car, but not by public transport. Making public transport to Heathrow a more attractive option, with journey times competitive in comparison to those by private transport needs to be addressed so that passengers from all over the UK have different options available for accessing Heathrow.

The priority is for schemes to provide direct rail connectivity through the delivery of Crossrail, Western Rail Link and Southern Rail Access because 50% of surface access journeys to Heathrow have origin/destinations in London and a further 25% in the South East. However, over a million passengers a year currently travel from Scotland, Yorkshire & the Humber, North East and North West England via ground transportation to Heathrow. Those travelling by rail outside of London need to travel to Paddington, by London Underground or make use of one of the rail-air coach services, so Heathrow connectivity can still be improved for the rest of the UK. If the Government is serious about improving the growth of our regional cities, improving traffic congestion and reducing vehicle emissions, these passengers and their locations need to be served via key rail interchanges so that public transport options are at least as attractive to them as private transport options.

For example, York has excellent connectivity with London via East Coast Main Line and as a result the journey via rail to Heathrow is around 40 minutes shorter than the equivalent road journey. Derby, on the other hand, has a road journey which is almost half as short as the rail option (150 mins by car vs. 276 mins by rail). 54% of passengers arriving at Heathrow from York have done so by rail or tube, for Derby it is only 21%, which highlights the effect good rail links have on passengers' transport choice.

Only Leeds/Bradford, Manchester, Newcastle and Liverpool serve more direct passengers from The North than Heathrow does each year. Currently, twice as many passengers reach Heathrow by public transport from Scotland, Yorkshire & the Humber, North East and North West England than Gatwick (in 2014 657k vs. 327k respectively) more than Newcastle (504k in 2013) and almost as many as Liverpool (688k in

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2014). In fact only Manchester can boast significantly more passengers from the North arriving via public transport (3m in 2014).

The Piccadilly Line upgrade will increase line capacity by 60% through a new signaling system and trains allowing faster and more frequent services. While delivery timescales are yet to be finalised, this could provide up to 18 trains per hour serving Heathrow, compared to 12 trains per hour currently. This will improve the offering for passengers arriving at Heathrow from northern cities via London. Western Rail Link to Heathrow by National Rail's Control Period 6 will provide yet more integration to cities like Newcastle, Derby, Sheffield and Leeds via Reading.

The new HS2 interchange at Old Oak Common will be served by frequent Heathrow Express and Crossrail services, providing important connectivity to key cities in the Midlands and the North. This will transform Heathrow journey times for the North, bringing Birmingham within an hour of Heathrow and both Manchester and Leeds within around 90 minutes. This will make rail journey times to the airport significantly better than those by road and also avoids multiple interchanges through London by rail for passengers traveling from the North.

With these additional rail services in place, the number of trains per hour serving Heathrow would double by 2030 to 36 trains per hour with capacity increasing from around 5,000 seats per hour to almost 13,000. Improving rail connectivity to Heathrow will grow the number of people and businesses that can access Heathrow and its direct global connections. Heathrow's surface access strategy sees substantial increases in the number of people who could reach the airport by public transport. Shifting airport passengers from private cars to public transport will also free up capacity on the highway network and provide increased demand on public transport services throughout the day.

The Airports Commission concluded that better rail connections could bring 10 million people within three hours of the airport by public transport. In many locations this will mean that public transport is directly comparable or better than the alternative journey by road helping support the Government's objectives on modal shift and reducing road congestion and emissions for the UK.

Some of the key journey time savings for northern cities is summarised in the table below:

Station	2013		2032	
	Journey time	Interchanges	Journey time	Interchanges
York	3 hours 03 minutes	2	1 hour 52 minutes	1
Newcastle	4 hours 01 minutes	3	2 hour 54 minutes	2
Hull	3 hours 46 minutes	2	2 hour 51 minutes	1
Leeds	3 hours 30 minutes	2	1 hour 48 minutes	1
Liverpool	3 hours 29 minutes	2	1 hour 51 minutes	1
Manchester	3 hours 16 minutes	2	1 hour 28 minutes	1
Sheffield	3 hours 17 minutes	2	1 hour 39 minutes	1

These cities alone represent almost 500,000 pa direct passengers accessing Heathrow via ground transport today.

2. *What cost-effective infrastructure investments in city-to-city connectivity could address these weaknesses? We are interested in all modes of transport.*

The Commission should note that it is not just city-to-city connectivity that could address these weaknesses, but also city-to-airport connectivity. Strategic connectivity to airports is important because as recognised in the European Commission's new European Aviation Strategy 'studies show that the better a city, region or country is connected by air to other destinations in Europe and other parts of the world, the more growth can be generated.' The Commission's new Strategy also recognises aviation and airports as 'strong drivers of economic growth, jobs, trade and mobility for the European Union' – and hence has listed 'tackling limits to growth in the air and on the ground by reducing capacity constraints and improving efficiency and connectivity' as one of its three key priorities. The surface access network connects people and freight to Heathrow, the UK's only hub airport. It generates economic growth by helping UK businesses connect with existing and emerging markets. Research shows there is a strong link between a passenger's surface access experience⁶ and their overall satisfaction with Heathrow. It is also a main influence on their choice of airport (CAA passenger choice report from 2011 pg. 20-21)⁷. Since passengers value reliable, convenient, direct and frequent services, we have to make sure that Heathrow's surface access meets the needs and expectations of its users.

3. *Which city-to-city corridor(s) should be the priority for early phases of investment?*

In terms of city-to-city connectivity, it is in the Government's gift to review and implement Public Service Obligations and protect domestic UK air links.

That said, connections to London Heathrow should be prioritised because Heathrow is one of the UK's most significant ports, moving the most freight by value in the UK. Heathrow is also the most important freight airport in the UK, moving more cargo than all other UK airports combined (CAA, UK Airport Freight Data, 1990 – 2014⁸, Refer to APPENDICES A & B).

4. *What are the key international connectivity needs likely to be in the next 20-30 years in the north of England (with a focus on ports and airports)? What is the most effective way to meet these needs, and what constraints on delivery are anticipated?*

One of the key international connectivity needs in the next 20-30 years in the North, which was recognised in the European Commission's recently launched European Aviation Strategy is 'the shift of the world's economic centre of gravity towards the East, notably Asia'⁹ and how the North will connect to the East. As outlined in our response to Question 1, Heathrow offers more direct and frequent flights to Asia because it is a hub airport and as a hub airport, Heathrow is different to other UK airports, because it can pool international, continental, domestic and local demand for leisure and business passengers as well as air freight, making direct flights to more cities around the world, particularly emerging markets, more commercially viable for airlines. Therefore with the global shift to the East, it is critical that northern cities are well connected to Asia and the most commercially viable way to do this to benefit the UK economy is through better connectivity to Heathrow airport.

That said the UK's regional airports play an important role in connecting regional city regions, but they play a different role to Heathrow. Regional airports have capacity and can provide services where there is direct demand. Otherwise access to a hub airport by surface transport or air is critical to satisfy the region's complete connectivity needs. Therefore surface access to airports and to Heathrow via air and rail are the most effective ways to meet future connectivity needs.

⁶ Heathrow Passenger Survey data QSM scores

⁷ https://www.caa.co.uk/uploadedFiles/CAA/Content/Standard_Content/Data_and_analysis/Analysis_reports/Passenger%20choise%20and%20information%20use%20-%20consumer%20research%20-%20produced%20by%20Accent%20for%20CAA%202011.pdf

⁸ <http://www.caa.co.uk/Data-and-analysis/UK-aviation-market/Airports/Datasets/UK-Airport-data/Airport-data-1990-onwards/>

⁹ The European Commission, Aviation Strategy for Europe, December 2015

2. London's transport infrastructure

1. *What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?*

As mentioned in section 1, with the global shift to Asia, London's status and its continuing success as a global centre for business is critically dependent on the quality of its international connectivity, as well as its local transport infrastructure. London is expected to see major population growth, but it is in competition with other cities around the world, so investing in London's transport infrastructure and connectivity is key to maintaining its competitive edge and status as a leading global city for its residents, businesses, international investors, exporters, students and tourists.

Demand for connectivity to Heathrow and the capacity of the UK's only hub airport are only going to increase with London's growing population. According to the Greater London Authority, London's population is currently around 8.6m people. The middle estimates for the population in 2050 are around 11m. With over 14m people living in the London commuter belt area, it is essential that people who wish to work and live in London are well connected to all parts of the capital, the South East England, the UK and to the rest of the world.

Heathrow airport obviously plays a significant role in connecting London to the world and the world to London, but it is also a major employer and driver of job creation across the capital. For many local commuters Heathrow is not at the end of the Piccadilly Line, it is at the start and enables them to access London and the associated job market. Similarly, Heathrow Connect and in the future Crossrail will play an important role in empowering airport related workers to make public transport journeys from West London. The Office of National Statistics work on Travel To Work Areas based on the 2011 census has shown that Heathrow and Slough were designated as a separate TTWA, rather than being spread between London and Thames Valley areas. This is against a trend of these areas growing and swallowing up areas due to more concentrated economic activity and a trend to longer commutes to work over the previous decade.

2. *What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?*

- *How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?*
- *What might their potential impact be on employment, productivity and housing supply in London and the southeast?*

One of the strategic options for future investment in large-scale transport infrastructure improvements in London is in improving Heathrow's connectivity to the wider rail network to ensure that London and the wider South East can benefit from and fulfil Heathrow's global hub route network, taking advantage of the interchange opportunities provided at Heathrow.

The key rail priorities for Heathrow are:

- Crossrail
- Western Rail Access
- Southern Rail Access
- Piccadilly Line upgrade
- HS2

Investment in rail to Heathrow is supported by Network Rail's 2013 London & South East Market Study, which notes how good rail connectivity to airports is important in supporting economic growth, productivity and social mobility and plays a key role in providing better access to markets,

national and international destinations, business and leisure opportunities, and to jobs. It confirms that integrating new and improved rail services with other transport modes at major airports is key to delivering sustainable travel opportunities and improving overall connectivity. The study recommends that rail services should provide for the growing demand to access airports by rail, with fast, convenient and reliable rail access to central London a priority for London's airports but direct access to non-London core economic centres both long-distance and within the London and South East area increasingly important.

In the future Heathrow will provide direct terminal access to passengers from every mode of transport. They will be connected to the Underground network and have fast dedicated rail services to London provided by Heathrow Express. In 2019 Crossrail will link Heathrow to the City, Canary Wharf and East London. Western Rail Access will provide fast direct services to the West and South Wales. Southern Rail Access will connect Heathrow to Waterloo and the South and South-West mainlines. In 2026 the new HS2 rail line will provide fast access to Heathrow from the Midlands and the North by 2030.

The transport improvements already committed plus those planned can transform Heathrow into a fully integrated national transport hub that offers connectivity benefits for the local area and the rest of the UK. Heathrow will be a vital component of the national transport system and provide new direct transport links for local communities.

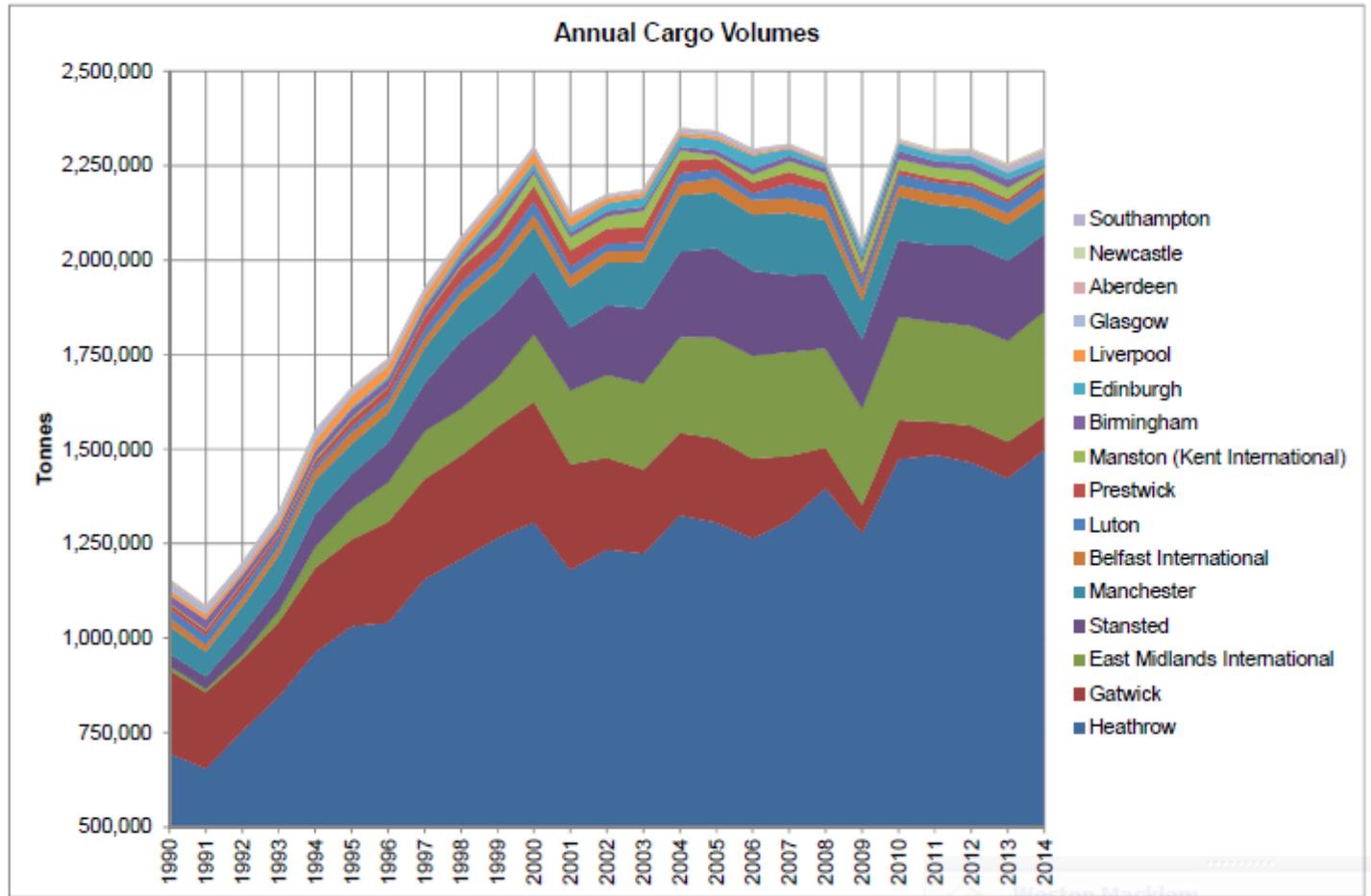
Increasing the modal shift onto public transport is also another priority for Heathrow. Heathrow's public transport improvements will increase transport resilience and give passengers, colleagues and members of the public choice. This is why we believe that projects like Crossrail, Western Rail Link and Southern Rail Access are essential, not just for Heathrow, but for the surrounding areas. Providing this infrastructure will increase public transport mode share, reducing the negative impacts on the local environment from car journeys such as traffic and emissions.

Southern Rail Access will also provide choices, by rail, for the large swath of Heathrow's passengers who live in South West London that don't rely on a journey into and out of central London. Western Rail Link will do likewise for the population to the west of the airport. While Crossrail 2 is not directly linked to Heathrow, enabling it to connect smoothly and quickly with Crossrail, Southern Rail Access and the existing rail and underground networks will mean more and more people are able to get to Heathrow more quickly and conveniently, whether they are coming across London or through it.

These, again, are good for the passenger, the local areas and the country as a whole. Planning and investment in progressing these strategic links to Heathrow should be a high priority in London's infrastructure improvements.

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APPENDIX A: CAA, UK Airport Freight Data, 1990 – 2014¹⁰



¹⁰ <http://www.caa.co.uk/Data-and-analysis/UK-aviation-market/Airports/Datasets/UK-Airport-data/Airport-data-1990-onwards/>

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APPENDIX B: CAA, UK Airport Freight Data, 1990 – 2014¹¹

Tonnes	Pax Aircraft					Freighters					Total				
	1990	2000	2005	2010	2014	1990	2000	2005	2010	2014	1990	2000	2005	2010	2014
Heathrow	606,066	1,208,924	1,227,836	1,398,369	1,424,270	89,281	97,983	77,850	74,619	74,636	695,347	1,306,907	1,305,686	1,472,988	1,498,906
Gatwick	193,736	289,209	169,000	102,454	88,506	26,355	29,753	53,779	1,577	3	220,091	318,962	222,778	104,032	88,508
East Midlands International	1,198	145		143	34	9,918	178,624		273,526	277,378	11,116	178,769		273,669	277,413
Stansted	261	2,802	1,347	1,911	1,185	32,266	165,021	235,698	200,328	203,540	32,527	167,823	237,045	202,238	204,725
Manchester	30,329	73,520	76,246	69,131	82,941	41,927	43,497	71,238	46,791	10,525	72,255	117,017	147,484	115,922	93,466
Belfast International	3,207	4,054	368	189	45	20,513	26,845	37,509	29,527	30,028	23,720	30,899	37,878	29,716	30,073
Luton	2,206	768	497	932	632	20,412	35,353	22,611	27,811	26,782	22,619	36,121	23,108	28,743	27,414
Prestwick	997	224	53	44	14	12,643	41,236	29,147	12,119	12,525	13,640	41,460	29,199	12,163	12,540
Manston (Kent International)				0	0				28,103	12,696				28,103	12,696
Birmingham	4,282	7,915	11,694	19,408	5,119	16,999	1,781	1,245	2,197	0	21,281	9,696	12,939	21,605	5,119
Edinburgh	916	2,192	485	339	203	241	16,088	29,110	20,018	19,166	1,157	18,280	29,595	20,357	19,369
Glasgow	7,612	8,331	7,967	2,762	14,623	11,186	469	766	151	788	18,798	8,800	8,733	2,914	15,411
Aberdeen	5,862	3,314	2,487	1,458	2,864	505	1,250	1,602	2,752	3,415	6,367	4,564	4,089	4,211	6,278
Newcastle	606	308	129	3,468	3,681	189	218	70	183	769	795	526	199	3,650	4,450
Southampton	975	253	203	116	131	154	6	1	0	3	1,129	259	204	116	133

¹¹ <http://www.caa.co.uk/Data-and-analysis/UK-aviation-market/Airports/Datasets/UK-Airport-data/Airport-data-1990-onwards/>



Heathrow Hub Ltd response to the National Infrastructure Commission's Call for Evidence

8th January 2016

Introduction

Heathrow Hub Ltd. is pleased to respond to the Commission's call for evidence on London's transport system, and the strategic options for future investment in large-scale transport improvements.

We are the promoter of one of the three schemes for airport expansion shortlisted by the Airports Commission and currently being considered by Government.

We suggest that the Commission considers London's transport system as part of a wider regional network. We believe that London, in its narrowest geographical sense, cannot be considered in isolation if the objective is to achieve the most economically, socially and environmentally effective and efficient overall system.

Investment in large-scale transport infrastructure improvements in London

Government has directed that the Commission is not to consider issues relating to airport capacity, stating "*the Davies Commission has already examined this issue in detail.*" However we believe the critically important issue of airport surface access should not be separated from wider considerations of London's transport network.

Heathrow suffers from poor rail connectivity compared to its major competitors, and passenger numbers will continue to grow as airlines optimise scarce capacity through use of larger aircraft. DfT forecasts terminal passenger numbers will increase in a two- runway constrained airport, from 73m in 2014¹ to c.93m by 2050.² An additional runway, if approved by Government, is forecast to increase Heathrow's terminal passengers to 170m by 2050.³

Roads are increasingly capacity constrained and background growth in rail demand places growing stress on the rail network. Separate consideration of airport and non-airport connectivity is unlikely to achieve the most efficient outcome.

Heathrow Express shows why an integrated strategy is needed. Using 20% of the Great Western Main Line's (GWML) constrained capacity, and scarce platform capacity at Paddington, it achieves a

¹ <http://www.heathrow.com/company/company-news-and-information/company-information/facts-and-figures>

² Annex E2 Terminal Passenger Forecasts (constrained), UK Aviation Forecasts DfT January 2013
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/223839/aviation-forecasts.pdf

³ Annex D8 ibid

very low load factor of c30% in the critical three-hour morning peak, at a time when other GWML services are operating at or above 100% capacity.⁴

As well as being inherently inefficient, this form of dedicated airport service fails to provide the best possible service for air passengers. European experience at for example Schiphol, Frankfurt and Charles de Gaulle shows that airports which are instead served by through stations on main lines provide air passengers with very high frequency services to a wide range of destinations.

Other passengers also benefit from the additional network capacity that would otherwise be inefficiently used by dedicated airport services. This is highly relevant to Government's request that *"the Commission should consider relevant international experience in major metropolitan areas, to review how other cities have responded to similar challenges and priorities, and whether there are any lessons to be learned and applied in London."*

The proven European approach has now been adopted in part for the similarly capacity constrained Brighton Main Line, where Gatwick Express services also serve Brighton in the peaks.

However, plans for dedicated airport services over a new Western Rail Access to Heathrow (WRAtH) continue to be progressed, despite the Airports Commission's analysis showing that such dedicated airport services from Reading and intermediate stations would have extremely low load factors⁵ as a result of slow journey times and the need for most passengers from the west to change trains at Reading.

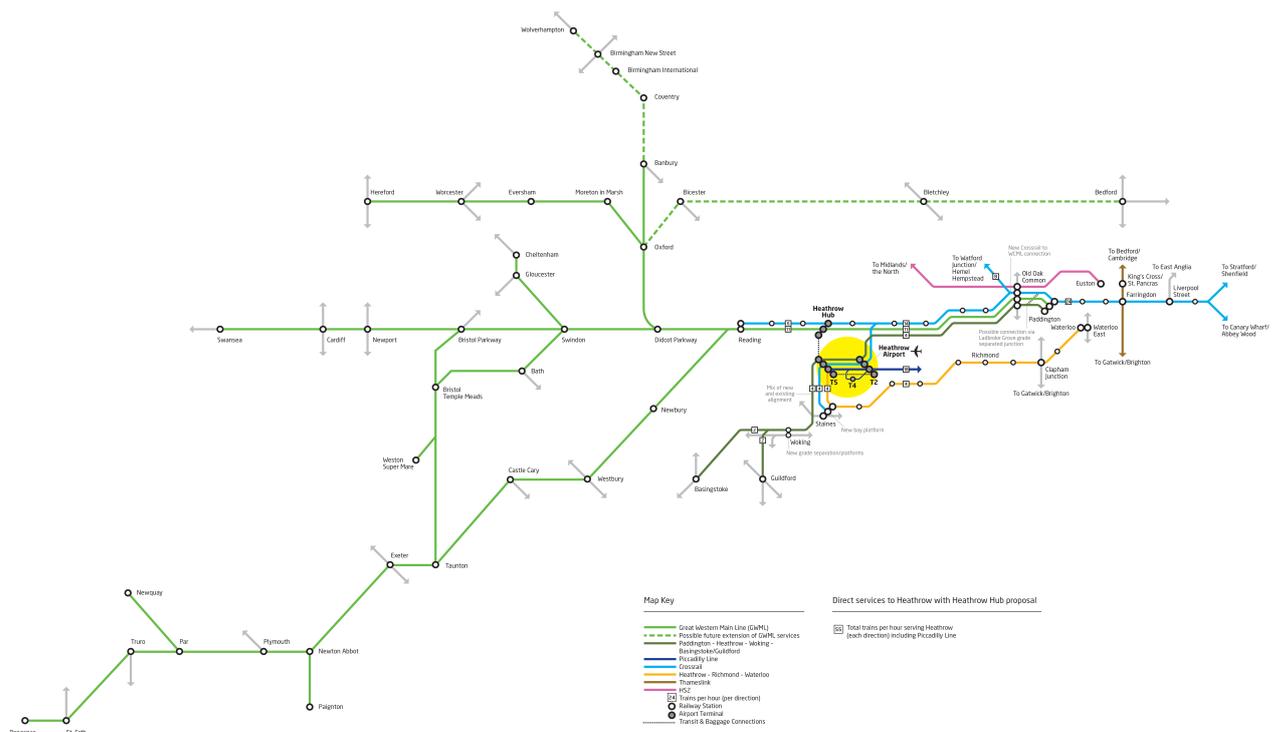
This is relevant to the Commission's consideration of London's rail network. WRAtH requires significant (4tph) capacity on the Great Western Relief Lines which, together with the need to retain and potentially increase freight paths, will act as a considerable constraint on Crossrail and prevent this very large investment from maximising its potential to the West of London. The proposed relocation of Heathrow Express's depot to Langley as part of the HS2 scheme may further exacerbate these capacity challenges, (with the additional risk that the depot could be redundant after expiry of Heathrow Express's Track Access Agreement in 2023).

Our alternative innovative and integrated approach to Heathrow's rail connectivity has two major benefits.

- It provides benefits to both airport and non-airport users, in line with Government's recognition of the need to *"consider the relative importance of, and trade-offs between, capacity, reliability, journey times and connectivity to markets"* and;
- It has a relatively low capital cost and high revenues, (as well as delivering very substantial wider economic and environmental benefits) and is therefore capable of being entirely financed by the private sector. This meets the Government's objective of *"funding and financing (infrastructure) in a way that minimises the tax payer burden."*

⁴ Table 4.2, London and South East Route Utilisation Strategy, Network Rail July 2011

⁵ *"A four train per hour service would have spare capacity with the busiest sections reaching 31% of seat capacity but reducing to as little as 16% of hourly seated capacity (and 6% of hourly total capacity) at the Reading end of the WRAtH route"* - Para 4.7.8, Surface Access: LHR-NWR, Jacobs for Airports Commission, November 2014



Our proposals comprise two principal elements.

1 - Heathrow Hub interchange

This road and rail interchange provides a new airport entry point and passenger processor, located on a largely unconstrained and readily developable 200 acre site c.4km north of Heathrow T5, on the Great Western Main Line (GWML) between Iwer and West Drayton stations where it crosses the M25. Fast passenger transit and baggage connections link the interchange directly to the airport campus, providing options for airside, landside or combined systems.

The station layout allows all GWML trains to call, with through lines allowing the option of Main Line non-stopping trains to pass at line speed. The station also effectively provides a dynamic loop on the Relief Lines in each direction, which, with its location roughly mid-way between Reading and Paddington, allows a new “Crossrail Express” service pattern west of Paddington. This, stopping only at Heathrow Hub and Reading, would be highly attractive to Reading passengers, incurring only a 8-10 minute journey time penalty compared to existing GWML services between Reading and Paddington.

This penalty would be more than offset by enabling passengers to avoid the need to interchange to Crossrail at Paddington. The likelihood that Crossrail will be integrated into TfL’s zonal fares structure also makes this an attractive alternative to existing GWML services, freeing these from the constraints imposed by their currently attempting to serve both commuter and long distance markets. The cross-platform interchange between stopping and express Crossrail services at the Hub would also reduce journey times for passengers from intermediate stations.

Current plans envisage 14 of the peak 24tph Crossrail service from the East turning back West of Paddington.⁶ With our proposal the extension of Crossrail to Reading allows a service pattern that unlocks the project's full potential and maximises the very considerable investment in this new infrastructure.

The Airports Commission also recognised the potential for the Hub interchange to provide air quality⁷ and road decongestion benefits⁸ as a result of dispersing road traffic entry points to the airport – an example of the benefits of an integrated, multi-modal approach to transport infrastructure planning.

2 - Southern Rail Access

This consists of two separate but related service groups.

The first, an amended version of BAA's former Airtrack scheme, provides direct services from London Waterloo to Heathrow via Clapham Junction and Richmond using a section of new rail infrastructure North of Staines between the Windsor Lines and Heathrow. We propose this would also be used by Crossrail, extending currently planned Heathrow services to terminate in a new bay platform at Staines to provide connectivity with currently un-served South Western catchments.

The second is a fast rail link from Woking to Heathrow, with trains from the South operating over a further new section of railway South of the junction with the Windsor Lines, twinned with the M25 motorway corridor and continuing through Heathrow, using the existing Heathrow Express paths, to Paddington. This overcomes the problems that contributed to the failure of Airtrack, including uncompetitive journey times and extended level crossing barrier downtime.

These combined proposals provide major benefits, those relevant to the Commission including:

- Direct trains to Paddington from the South and South West, providing an alternative London terminal with Crossrail providing excellent connections to the West End, the City and Docklands.
- Significant crowding relief to the South Western Main Line (and the LUL network at Waterloo for onward journeys). The density of operation on the Up Fast Line from Surbiton during the peak is higher than on any other single stretch of main line in the UK and Network Rail's Wessex Route Study forecasts a need for an additional 60% capacity in the high peak hour by 2043.⁹

⁶ <http://content.tfl.gov.uk/rup-20150212-part-1-item-09-crossrail.pdf>

⁷ The proposed Hub interchange "could potentially produce air quality benefits by bringing traffic off the M4 and M25 before reaching Heathrow" - Para 8.16 Final Report, Airports Commission July 2015

⁸ "The Hub has the potential to intercept traffic flows destined for Heathrow from the north and west, reducing pressure on already congested sections of the M4 and M25, plus the local roads approaching the terminals. Jacobs traffic analysis provides evidence that the approach reduces pressure on M25 junction 15, with lower peak hour flows approaching from all directions" - Para 5.3.2, Appraisal Framework Module 4, Surface Access: Heathrow Hub Station Analysis Compendium, Jacobs May 2015

⁹ "An additional 60 per cent capacity is required in the high-peak hour to meet the 2043 capacity conditional output for Main Line long distance services (conditional output CO3). This implies a need for more than 150 extra passenger vehicle arrivals at London Waterloo during the high-peak hour, which is equivalent to an additional 13 paths (assuming 12-car 20 metre vehicles configured with 3 + 2 seating in standard accommodation)" – Para 4.2.44, Wessex Route Study, Network Rail August 2015

- Significant crowding relief to LUL services at Waterloo.
- Maximising effectiveness of Crossrail investment.

More radically, this proposed service pattern could take advantage of the possible intervention identified in Network Rail's Western Route Study of a new grade - separated junction in the Ladbroke Grove area in CP6 alongside a rationalisation of the Paddington approaches.¹⁰ Subject to the detailed design of the junction, it is possible that this would allow Woking/Heathrow services to run on the Great Western Main Lines from Airport Junction, using existing Heathrow Express paths, before crossing to the Relief Lines to continue through the Crossrail central London tunnel. This would dramatically improve London's connectivity whilst also releasing valuable platform capacity at Paddington.

We commissioned modeling from AECOM (formerly URS), using, with their agreement, HAL's "LASAM" and TfL's "Railplan" models.

The results indicated an average peak loading of around 387 passengers per train between Woking and Heathrow (around 60% of capacity), the majority of whom are forecast to transfer from Waterloo services. This provides significant and highly desirable direct relief to the South Western Main Line and the LUL network serving Waterloo.

The trains would be at around 100% of capacity between Heathrow and Old Oak Common – compared with c30% for Heathrow Express currently, thus delivering effective use of scarce line capacity.

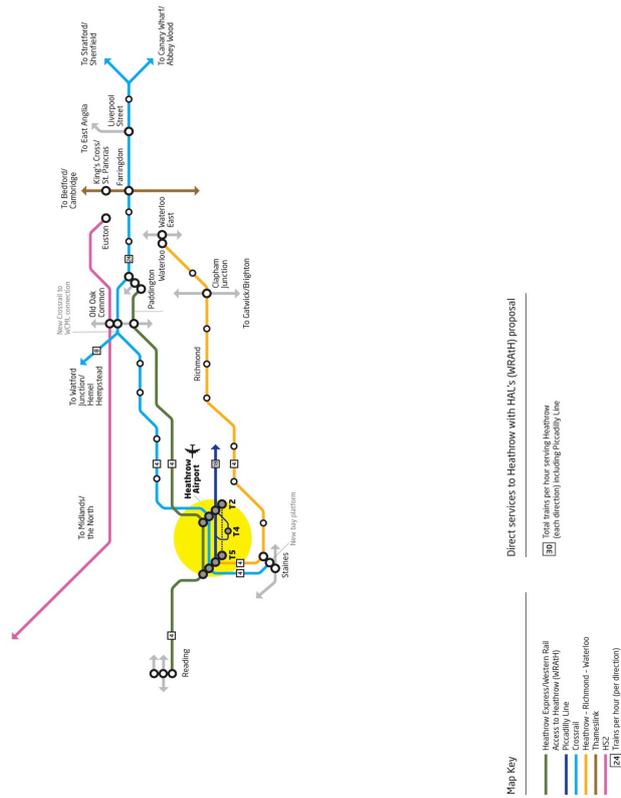
Conclusion

We believe our proposals provide overwhelming benefits and, critically at a time of constraints on public expenditure generally and on rail enhancements in particular, are capable of being privately funded.

Our proposals have been developed with a world class team of expert consultants including AECOM, Gardiner & Theobald and First Class Partnerships and in liaison with Network Rail and TfL. Heathrow Hub Ltd has also participated as a full member in Network Rail/DfT's Southern Rail Access Working Group, the report of which is due to be published shortly.

We believe it is helpful to compare our integrated proposals with the alternative rail schemes that are being separately brought forward.

¹⁰ "Grade separation of Ladbroke Grove Junction would increase the capability of the whole system, reducing the level of conflicting train movements creating greater timetable capability, increasing flexibility in the platforming and operation of services using London Paddington and associated depots"- 05, Western Route Study, Network Rail August 2015



In contrast, the current uncoordinated plans for Heathrow Express, WRAtH and Crossrail achieve far fewer benefits at a high cost to the public purse, deliver a lower overall return on investment and, in the case of WRAtH, are likely to require ongoing revenue support.

We have deliberately made this submission as brief as possible but would of course welcome the opportunity to engage with the Commission to discuss our proposals in greater detail.

Contact

Steve Costello, Director Heathrow Hub

Ltd

[email and telephone number redacted]

National Infrastructure Commission call for evidence: 'London's transport infrastructure'

Evidence submitted by the iBUILD Infrastructure Research Centre,
January 2016

Introduction

The iBUILD (Infrastructure **B**usiness models, valuation and **I**nnovation for **L**ocal **D**elivery) Infrastructure Research Centre brings together a multi-disciplinary team from Newcastle, Birmingham and Leeds Universities to improve the delivery of local and urban infrastructure. iBUILD is developing and demonstrating alternative infrastructure business models that: take a whole life cycle view of infrastructure systems; exploit technical and market opportunities from modern interconnected infrastructure; leverage economic, social, environmental, aesthetic and other values from infrastructure; identify changes in governance, regulation and policy to unlock improvements; and, use innovative financing and funding mechanisms.

iBUILD promotes a service and system-wide approach to local and urban infrastructure, believing that there are significant advantages to be gained from planning, investing and managing infrastructure on an interdependent basis. As the recent floods in Cumbria, Northumberland and elsewhere in the north of England demonstrated, long-term resilience should be built into the UK's infrastructure sectors and systems. Otherwise, the potential economic and social benefits that can be derived from infrastructure investment will be marginal compared to the economic, social and environmental costs of repairing infrastructure that is damaged or destroyed by adverse (but increasingly regular) weather-related events.

The emergence of the National Infrastructure Commission (NIC) reflects the recent emphasis towards national scale infrastructure planning in the UK, and provides an important strategic context for the planning, development and operation of infrastructure. However, it is also important to consider the distinct role of local and urban infrastructure in driving local, regional and national economies. It is at the local and urban scales where infrastructure services are most dense and where the majority of people use infrastructure services in their everyday lives. Balancing growth across different geographical scales – from the local to the city/city-region – is vital to the long-term success of the national economy, as infrastructure drives local economic growth and job creation, as a consequence of construction and management activities as well as the enhancement and facilitation of other economic activities.

The response below first summarises key findings from our research programme that are relevant to all infrastructure delivery, before specifically responding to the consultation questions. Our response draws predominantly on new research identified during the iBUILD project, but also decades of research and experience in the iBUILD team. This includes engineering expertise in the Centre for

Earth Systems Engineering Research (CESER)¹ and the Institute for Resilient Infrastructure (IRI)², and the long-standing track record in local and regional development by the Centre for Urban and Regional Development Studies (CURDS).³

iBUILD focuses on all infrastructure sectors, not just transport, but our work has also drawn lessons from non-infrastructure sectors. Where our research is undergoing external peer review we cite working papers which, amongst other work, can be found at www.ibuild.ac.uk.

iBUILD Mid-Term Review and Policy Manifesto

In March 2015, iBUILD published a mid-term review and manifesto setting out thirteen evidence-based policy recommendations on how local and urban infrastructure business models could be strengthened in both design and in application. The key recommendations are elaborated in the full manifesto document which is available online.⁴

Research from across the iBUILD Centre has identified five priority action areas for government and industry. If applied to all infrastructure planning and decision-making, these action areas will help to challenge the “timid, uncoordinated, incremental, wasteful”⁵ way the UK currently builds and manages its infrastructure, and help to develop a new approach to delivering infrastructure systems and their services that will enhance the health, wealth and security of UK citizens.

Priority Action Area #1: Have a broader, integrated appreciation of infrastructure

Infrastructure is not just tracks, tubes and trunk roads. Failure to consider the resources that flow along these, the services they provide and the people and businesses that depend on them, will lead to investments that don't deliver effectively. At the same time, it is crucial to understand how all these systems are interconnected; infrastructure depends on other infrastructure to work, not just technically, but also economically and socially. The UK's infrastructure is amongst the most mature and interconnected in the world and therefore has a pressing need to adopt a broad, integrated and sophisticated approach to infrastructure planning.

Recommendation 1: Infrastructure planners, financiers, engineers and other stakeholders need to use a broad, but appropriately specified, definition of infrastructure if they are to identify the full range of opportunities from alternative business models.

Recommendation 2: Housing and ‘hidden infrastructure’, such as efficiency measures, should be considered alongside the large-scale capital investments with which they interconnect, within infrastructure and spatial planning processes

¹ www.ncl.ac.uk/ceser

² <https://www.engineering.leeds.ac.uk/resilience/>

³ www.ncl.ac.uk/curds

⁴ iBUILD (2015) *Are you being served? Alternative infrastructure business models to support economic growth and well-being*, iBUILD Manifesto and Mid-term Report, Newcastle University: Newcastle upon Tyne. The full manifesto can be downloaded from <http://research.ncl.ac.uk/ibuild/outputs/>

⁵ Infrastructure UK (2010) *National Infrastructure Plan 2010*, First NIP: October 2010, HM Treasury.

Recommendation 3: National reforms in policy and regulation are required to enable an integrated approach to local infrastructure planning that can identify, and has the capacity to exploit, synergies across infrastructure sectors.

Priority Action Area #2: Enable action at the local scale that connects with the national

Too much infrastructure planning is top-down, yet every piece of infrastructure has to go somewhere; it is inherently local. Top-down approaches to infrastructure development and management stop locally-led and innovative business models from flourishing and discourage innovation. It also risks the wrong infrastructure being put in the wrong place at the wrong time because of a lack of local knowledge, engagement and ownership. These issues prevent the UK from maximising returns from infrastructure investment. The UK must devolve an appropriate and sensible proportion of infrastructure investment and responsibility to local institutions so they can deliver infrastructure that better reflects the values and needs of the communities it serves, yet remain mindful of the national strategy.

Recommendation 4: National and local policy frameworks should be realigned to focus on delivering wider societal benefits and to enable local infrastructure business models to emerge that can provide local solutions that are complementary with mainstream systems.

Recommendation 5: Effective operation of local alternative infrastructure business models requires greater fiscal decentralisation, complemented by a stronger and statutory devolved role for cities and localities in the planning, development and delivery of infrastructure.

Recommendation 6: Provide support for a wider range of innovative local infrastructure financing mechanisms, including tax increment financing, municipal bonds, social impact bonds and crowd source funding approaches.

Priority Action Area #3: Capture long-term value of every kind

Infrastructure is not only about cash returns. Investment in infrastructure provides wider health, economic and environmental benefits for society; infrastructure converts financial value to social value. A new economic valuation system that recognises these long-term, whole-life benefits is essential to maximise the benefits. Infrastructure must also be built for minimum whole-life costs. This might mean paying a bit more upfront for something that will last – and serve – for longer without the need for frequent maintenance; a resilient and sustainable infrastructure.

Recommendation 7: Incorporate measures of social and environment benefit (and cost) into infrastructure appraisal frameworks to recognise the wider societal and environmental outcomes and ascertain the widest possible set of mechanisms to capture revenue and other values.

Recommendation 8: Implement a quantitative framework within the infrastructure appraisal process to assess the value of flexibility and resilience across the whole system over the long-term.

Recommendation 9: Local authorities and infrastructure owners should apply resource assessments as a matter of course to identify the potential of land and infrastructure assets to generate long-term, stable revenue streams and not just one-off, short-term windfalls from selling-off assets.

Recommendation 10: Employ a new approach to infrastructure economics that recognises the long-term and system-wide value of infrastructure provision.

Priority Action Area #4: Deliver more efficient planning, procurement and delivery

Approaches to project financing, funding and delivery should not be chosen for political reasons. Mechanisms must be adopted that can best deliver the desired economic, social and environmental values, regardless of their political flavour. Many of methods and tools to enable this already exist: the Project Initiation Routemap, Building Information Modelling (BIM) systems, life-cycle assessment, so they must be used. These approaches support more efficient planning and procurement, minimise costs and human effort, preserve the environment, and maximise the potential to reuse and recycle materials and components in the future.

Recommendation 11: Implementation of the Project Initiation Routemap has been shown to have many cost reduction benefits and should be made standard practise for all public funded projects.

Recommendation 12: Planning and design of infrastructure should consider the material and resource demands of infrastructure pipelines to identify opportunities for reducing waste in the construction and operation phases, whilst designing for end of life material recovery or repurposing of infrastructure.

Priority Action Area #5: Accelerate the uptake of innovations through practical action and demonstration

Action often speaks louder than words. Alternative approaches to infrastructure business models are emerging. However, to quickly identify the most successful approaches and encourage their wide uptake locally, nationally and internationally, a number of ambitious demonstrator sites should be established for integrated infrastructure planning and testing of innovative infrastructure business models.

Recommendation 13: Establish full-scale urban demonstrator sites for integrated infrastructure planning and testing of innovative infrastructure business models.

1. What are the major economic and social challenges facing London and its commuter hinterland land over the next two to three decades?

Key messages:

- *As with all UK cities, London faces significant economic, social and environmental challenges over the coming years. Population growth, in absolute and relative terms, poses a particularly significant challenge in London and the wider city region.*
- *Governing and planning for growth and meeting future challenges, in London and the wider city region, requires effective institutional and administrative co-ordination between the Mayor of London, Greater London Authority and local authorities in the south east of England.*
- *No strategy will tackle all the challenges, and trade-offs between planning and infrastructure choices are inevitable. However, redressing the London-rest of UK balance by stimulating growth elsewhere will help alleviate many of these pressures in London.*

iBUILD researchers have been examining the governance of infrastructure funding and financing in the London mega city-region. Interviews undertaken as part of the study have sought to identify the major economic, social and environmental challenges facing London in relation to infrastructure.⁶ The overwhelming majority of interviewees have stated that the fundamental challenge facing London is how to ensure that there is adequate housing, transport, water, energy, communications and other infrastructure to accommodate and absorb the significant population growth that has taken place, and is projected to occur, within the administrative boundaries of London and the broader city region. In one interview, a stakeholder suggested that:

“Population growth requires the opening up of new locations for housing growth. There could also be the opening up of existing residential areas. All the accompanying infrastructure that is required to enable housing growth to be sustained is the number one challenge.”

Dealing with the implications of population growth poses profound questions about the planning, governance, funding, financing and operation of infrastructure across and within the London functional economic geography. There is limited, if any, formal strategic planning activity across the functional city-region, and there are noticeable differences in the institutional capacity, statutory responsibilities and funding of the Greater London Authority (GLA), London Boroughs and individual local authorities and Local Enterprise Partnerships (LEPs) in the south east of England outside London. The limited strategic planning capability at the interface of these organisations makes the case for long-term planning and securing public and private (particularly international) investment in infrastructure problematic. The Mayor of London, GLA and South East local authorities and LEPs are

⁶ Stakeholder organisations that have taken part in the iBUILD research, include: the Greater London Authority; Transport for London; London First; and the Department for Transport.

attempting to overcome these spatial challenges by working through a new voluntary ‘wider south east summit’ framework. These arrangements could offer some scope for project or programme-based ‘deal-making’ between different local authorities in the city region in an attempt to plan urban development collaboratively and to use geographical scale as a means of generating new investment and attracting private sector contributions in infrastructure in London and the wider South East. Continued institutional ‘reform’, in an attempt to overcome local administrative fragmentation, and improve urban economic performance⁷ is a noticeable feature of how many global cities are governed.⁸ The recent establishment of *Métropole du Grand Paris*, as well as current plans to manage the delivery of spatial and economic strategies within and across the Sydney ‘city-region’, illustrate how local and national actors continually attempt to co-ordinate and ‘improve’ the governance of large metropolitan areas.⁹

The other major economic and social challenges facing London and the wider city-region, include:

- Improving transport mobility and accessibility for people in London and the wider city region, for work and leisure purposes.
- For many employers, the issue of housing is of heightened significance because of the affordability crisis and some of the difficulties that companies face in recruiting and retaining staff in London. Ensuring that ‘doing business’ in London remains a viable proposition for international and national firms, which means preventing the cost of business (in terms of commercial rents) from becoming prohibitive.
- Providing sufficient brownfield sites in London and the wider city region for commercial and residential use, and that GLA, London Borough and local authority statutory plans are aligned and there is agreement upon what development is built where.
- Tackling poverty and low wages in London, and ensuring that transport infrastructure supports affordable access to job and training opportunities and addresses and does not exacerbate the problem of rising inequality in different parts of the city and city region.
- Managing the growing demand for health and social care services, as well as ensuring there is ‘quality’ early years and post-16 education for children and young adults.
- Creating and maintaining sufficient green spaces to underpin and support greater social equality and improved individual and collective environmental health and well-being.
- Addressing poor air quality and environmental degradation.
- Improving water quality and maintaining the effectiveness of flood defences.

⁷ Ahrend, R., Farchy, E., Kaplanis, I. and Lembcke, A. C. (2014) ‘What Makes Cities More Productive? Evidence on the Role of Urban Governance from Five OECD Countries’, *OECD Regional Development Working Papers*, 2014/05, Organisation for Economic Cooperation and Development: Paris.

⁸ Storper, M. (2014) ‘Governing the Large Metropolis’, *Territory, Politics, Governance*, 2(2): 115-134. Katz, B. and Bradley, J. (2013) *The Metropolitan Revolution: How Cities and Metros are Fixing our Broken Politics and Fragile Economy*, Brookings Institution Press: Washington D.C.

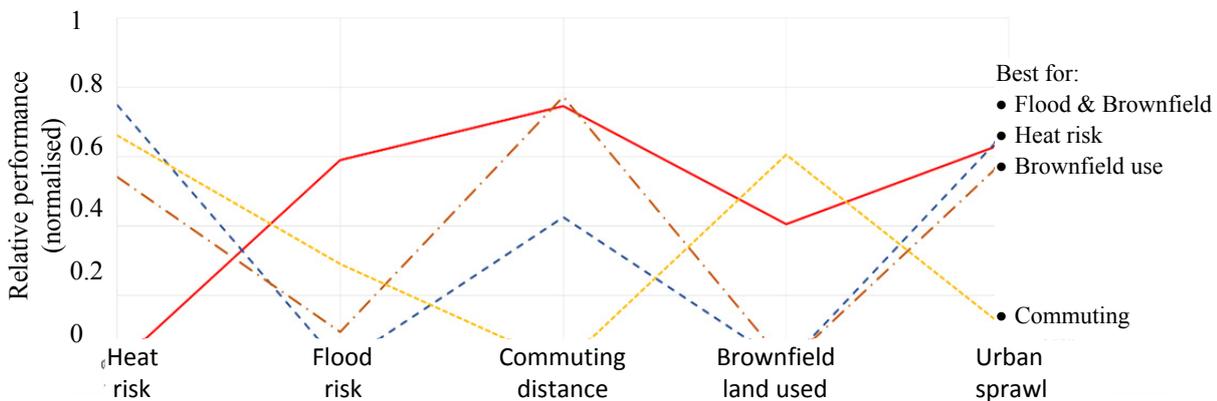
⁹ ‘Grand Paris’ will encompass an assembly of 209 councillors, drawn from local municipalities, and its area of jurisdiction will cover the densest part of the Paris region (covering approx. 7mn people). The new institution will incrementally take on new responsibilities, including urban planning and fiscal powers. By 2018, it will be headed by a new president. The Greater Sydney Commission is a new independent body, created by the New South Wales Government, which will be responsible for metropolitan planning in the Sydney metropolitan area, in partnership with State and local government – see:

<http://www.planning.nsw.gov.au/Plans-for-Your-Area/Sydney/A-Plan-for-Growing-Sydney/Greater-Sydney-Commission>

- Ensuring that London and the wider city region have the capacity and capability to fund and finance urban infrastructure now and in the future. Link to value capture in uplift from public investments and improving on the historically weaker efforts e.g. with Crossrail

It is rarely possible to satisfy all objectives, as is shown in Figure 1, where, for example, strategies that are good for managing flood risk can increase transport use and travel distance for commuters.

Figure 1: Tradeoffs between planning and infrastructure investment choices in London



Source: Caparros-Midwood *et al.* (2015).¹⁰

¹⁰ Caparros-Midwood D, Barr S, Dawson RJ (2015) Spatial Optimization of Future Urban Development with regards to Climate Risk and Sustainability Objectives, Risk Analysis. (also presented in 2nd UGEC conference, Taiwan: <http://ugec2014.squarespace.com/daniel-caparros-midwood>)

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London – on road, rail and underground – including, but not limited to Crossrail 2?

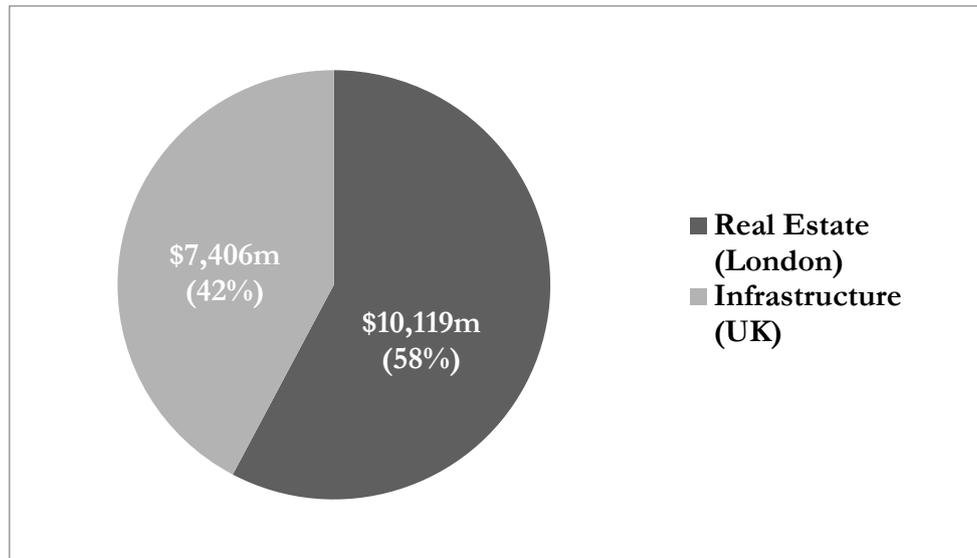
Key messages:

- *Transport infrastructure improvements led by Transport for London and other similar sponsors will increasingly be required to demonstrate their contributions to growth, jobs and housing development, beyond alleviating transport congestion.*
- *Private sector investors are more likely to invest in the early stages of transport schemes if they are part of a broader urban regeneration or development programme*
- *Central government will continue to play an important role in providing regulatory and/or financial backing for large-scale transport projects in London.*
- *Government financial support is also likely to form part of broader, multi-faceted funding packages.*
- *Small-scale interventions can play an important role in improving London's transport infrastructure.*

Under the leadership of Sir Peter Hendy, Transport for London (TfL) began to situate transport investment in a wider context and as an instrument that is measured for its broader impact above and beyond achieving journey time savings. TfL's corporate strategy and business plan have been written so that they identify and explain how individual investment transport infrastructure projects will contribute towards the economic growth and overall prosperity and performance of London. TfL has concluded that planning and investing in transport for London has to demonstrate the wider economic costs and benefits of investment.

Against this background, TfL and other transport infrastructure sponsors have framed Crossrail 2 as a specific intervention that could open up new housing sites and development opportunities as well as improving transport connectivity. This approach reflects the belief that there is a virtuous relationship between transport – housing – spatial planning and local/urban development. International sovereign wealth funds looking to invest in London's transport infrastructure will do so if there is a definitive revenue-raising urban regeneration or housing development scheme attached to a transport project, such as the Nine Elms development, which includes the Northern Line extension. The returns available in London real estate and property make investments in these assets more attractive to foreign investors than transport infrastructure alone (see Figure 2). Furthermore, major transport schemes will always require government-funding as they are often considered too risky for the private sector. Thus, national and local/city-regional governments will continue to play a major role in transport infrastructure planning and investment, especially in large metropolitan areas like London, despite the fact that investment markets are more buoyant in these places than in many other cities.

Figure 2: China foreign direct investment in the UK (2005-2014)



Source: Pinsent Masons and CEBR (2014).¹¹

In terms of future transport linkages, TfL, the Greater London Authority (GLA) and local authorities should recognise the importance of both radial and orbital transport connections in the London city region, as there are important economic units within and outside London's formal administrative boundaries. This requires economic and spatial plans to be aligned and to consider how London and the wider city region is set to develop in terms of population, housing and business growth. For example, in an illustration that the economic centre of London has been moving 'eastwards', TfL announced in January 2016 that it was re-zoning eight London Underground stations near Stratford and the 2012 Olympics site to the boundary of Zone 2 of the Underground.¹² Much of London's future growth is expected to be focused on the capital's Opportunity Areas, which will feature dense, mixed-use developments with high public transport connectivity – particularly in the east of London (Travel in London Report 8, 2015). TfL and the GLA are using the Opportunity Areas to shape and steer the London Plan and give it a clear linkage to economic strategies. Going forward, there will be a visible link in how transport is expected to transform the Opportunity Areas.

Atkins suggests that the focus on public transport improvements (such as rail and road capacity) could be strengthened in the London Infrastructure Investment Plan 2050 if priority was given to bus and cycle networks (to better connect outer London and are important assets for lower-income households)¹³ – helping to build and support a more inclusive and sustainable city region. While the remit of the NIC is on major transport schemes it is important to recognise that there are direct and indirect economic, social and environmental impacts from investment decisions that are based on small-scale interventions. There is also a need to focus on improving the existing transport network in

¹¹ Pinsent Masons and CEBR (2014) [China Invests West: Can Chinese Investment be a Game-changer for UK infrastructure?](#) Pinsent Masons and CEBR: London.

¹² Topham, G. (2014) 'East London tube, DLR and rail stations change zones', [The Guardian](#), Monday 4 January.

¹³ Atkins (2015) [Future Proofing London](#), Atkins and Oxford Economics: London.

London, building upon TfL's interest in whole-life asset management and benchmarking in support of improving performance and resource efficiency. We would, therefore, expect TfL and local highways bodies to look at how best to improve the maintenance and operation of the existing road network, which has seen increased congestion recently, particularly in parts of outer London. SMART technology can also help to manage performance, and TfL has made significant strides in gathering, analysing and deploying 'big data', but as recent events have demonstrated, even these assets have to be made more resilient to 'shocks'.¹⁴

We would anticipate that the strategic options for future transport investment in London would encompass, or at least benefit from, further rail devolution to London and the South East. TfL is looking to apply its existing operational experiences to suburban rail services, where, in some cases, there has been significant improvements. For example, the London Overground network, largely established since 2008, has seen a 321 per cent increase in journey stages between 2008 and 2014, on a like-for-like basis – reflecting the rapid development and enhancement of the network.¹⁵

¹⁴ 'Oyster card glitch leads to free travel in London', BBC News, Saturday 2 January 2016: <http://www.bbc.co.uk/news/uk-england-london-35213346>

¹⁵ Mayor of London/TfL (2015) *Travel in London Report 8*, Mayor of London/Transport for London: London.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Key messages:

- *Crossrail 2 must better capture the value it delivers to the private sector, in particular through capturing the uplift of land and property value, and improving connections to major transport hubs.*
- *Crossrail 2 offers significant development opportunities and connectivity benefits, but at a projected cost of up to £32bn the case has to be made that this investment could not deliver better returns through a series of smaller scale projects in other UK regions.*
- *The Department for Transport, Transport for London and other major transport sponsors should heed the lessons of Crossrail, and consider the recommendations of the National Audit Office to ensure that Crossrail 2 and other large-scale projects deliver value for money for UK tax-payers where government grants have been included in funding packages.*

TfL estimates that Crossrail 2 will cost somewhere between £27bn and £32bn (with a 66 per cent optimum bias included), in 2014 prices and includes the cost of new trains and Network Rail works. In evidence to the London Assembly, PwC suggested that the estimated cost of Crossrail 2 could, if the optimism bias was reduced to a ‘more realistic’ 44 per cent, be around £20bn.¹⁶ The project intends to relieve demand on London’s transport network, and to provide capacity for an extra 270,000 people to access central London at peak times by increasing the number of trains from major destinations across south west London and Surrey (including Wimbledon, New Malden, Kingston and Epsom) and across north east London and Hertfordshire (including Tottenham Hale, Waltham Cross, Cheshunt and Broxbourne). A London Chamber of Commerce poll found that 44 per cent of London businesses saw Crossrail 2 as their top transport priority.¹⁷

The cost of Crossrail 2 is significant, roughly twice the annual capital investment budget spent in London (£15bn), and represents approximately £376m for every mile of the 85 miles of proposed line. The Chancellor of the Exchequer, George Osborne, has indicated that at least 50 per cent of the funding for meeting the cost of Crossrail 2 should come from private sources, which some business organisations have suggested is feasible.¹⁸ While some costs could be saved on the rolling stock for Crossrail 2, further costs are expected to be found during the detailed design stage of the route. A premium will be placed on TfL identifying further savings given that businesses believe that the high cost of transport projects in London is a significant barrier to the delivery of infrastructure improvements.¹⁹

¹⁶ Minutes of evidence available at: <https://www.london.gov.uk/moderngov/documents/s47535/Minutes%20-%20Appendix%201%20-%20Transcript%20Crossrail%202.pdf>

¹⁷ Further details on the London Chamber of Commerce poll available at: http://www.londonchamber.co.uk/lcc_public/article.asp?aid=7197

¹⁸ London First (2014) *Funding Crossrail 2: A report from London First’s Crossrail 2 Task Force*, London First: London.

¹⁹ According to business surveyed in the London Chamber of Commerce poll.

In putting together the funding and financing package for Crossrail 2, the lessons of Crossrail [1] should perhaps be heeded. In particular, Crossrail 2 will be scrutinised for how it captures private land and property value uplift that is expected to be generated given the experiences of Crossrail [1]. Researchers have forecast total house price growth of 13 per cent, between 2013 and 2018, for residential properties located near Crossrail stations, with up to 20 per cent growth in Central London, in addition to underlying capital growth.²⁰ With criticism that the taxpayer could have benefited more from Crossrail in the form of greater tax receipts on developments near proposed stations, it has been suggested that more targeted developer contributions should form part of the funding package for Crossrail 2.²¹ Furthermore, Crossrail does not connect with other recent transport investments such as the Eurostar station at St Pancras or Terminal 5 at Heathrow, and it does not necessarily serve the areas of greatest potential expansion in and around London. Consequently, the final agreed route of Crossrail 2 will need to connect or integrate effectively with other existing or proposed transport infrastructure assets, such as the HS2 terminus in Euston, without producing negative impacts for local residents and businesses in places such as Camden, which brings into focus once again the governance and spatial planning implications of co-ordinating major transport infrastructure investment in London and the wider city-region.

The broader industry contribution of Crossrail is, however, also significant, particularly in the area of skills, where the Tunnelling and Underground Construction Academy, funded primarily by Crossrail, is training the next generation of future engineers. Such inputs should ensure that there are legacies of improved efficiency and productivity in future large-scale [underground] transport infrastructure projects similar in nature to Crossrail.

With the current public consultation for Crossrail 2 closing on 8 January 2016, TfL will have, at its disposal, a large volume of evidence and opinion, submitted as part of the consultation exercise. In addition, the Crossrail 2 Growth Commission's call for evidence, which closed on 23 December 2015, is also expected to be an important source of information, data and evidence that TfL and partners will have as they seek to reflect upon how best to strengthen the benefits and reduce the costs of Crossrail 2. In the current austere times, and with demands for more transport investment in the regions and nations outside of London, the economic, social and environmental case for Crossrail 2 will come under ever-closer scrutiny, and the project will need to demonstrate that it can be delivered in an effective and cost-efficient manner. TfL and the other sponsors of Crossrail 2 will no doubt be guided by the findings of the National Audit Office in its 2014 report on Crossrail, to see what lessons that can be applied in the project development and implementation of Crossrail 2. In considering the costs and benefits of Crossrail 2, it is useful to reflect upon the following recommendations in the NAO's review, which were directed specifically at the Department for Transport (DfT), and outlined a series of steps to strengthen tax-payer 'value for money' from future major transport projects:²²

- Do more to secure private sector funding contributions. The Department should ensure that when it negotiates contributions to projects from businesses and other organisations, these are based on

²⁰ CBRE (2013) *Crossrail: The Impact on London's Property Market*, CBRE: London.

²¹ Pickford, J. and Allen, K. (2014) 'Crossrail a shot in the arm for London property developers', *Financial Times*, 6 March 2014.

²² NAO (2014) *Crossrail, Report by the Comptroller and Auditor General*, National Audit Office: London, p11.

robust and realistic calculations of the benefits to business. The Department should also work to understand private sector funders' interests in its projects and how these may affect the certainty of funding.

- Consider how to achieve greater continuity in departmental officials' oversight of major programmes. The Department should identify how it will manage staff assignments to its various programmes, ideally to appoint officials for longer periods, and to manage the 'handover' process, where necessary, to achieve a smooth transition.
- Monitor all costs on major programmes including development, start-up and sponsorship costs so that it can develop an understanding of the true costs of major programmes, to help it keep these costs under control. We would expect all government departments to do this on their major programmes.
- Ensure that programmes have sufficient cash available to provide security and flexibility to the delivery body, while minimising opportunity costs.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

Key messages:

- *iBUILD research has identified a range of funding and finance schemes (Table 1) suitable for large projects, each with different advantages and disadvantages.*
- *TfL's strategic oversight in London, compared to other transport governance structures in the UK, provides them with far greater opportunity to capture and utilise value.*
- *TfL and other transport infrastructure sponsors in London will be encouraged to identify and adopt more 'innovative' funding and financing packages to support transport infrastructure investment. However, such packages are likely to be based on greater speculative forms of urban development and therefore may increase the financial risks for TfL and other institutions.*

Against the background of a reduction in central government grant funding to cover its operational budget, TfL has been encouraged to be more 'innovative' in how it funds and finances transport infrastructure in London. According to one DfT official:

“We've strongly encouraged TfL to get more savvy in the way it generates income from its estate, for example, so it's got a very ambitious commercial development programme now, which covers everything from, the sponsorship deals for Santander cycles to advertising at tube stations, to flogging off the old headquarters at 55 Broadway, which is all going to be turned into luxury homes and so on...” (iBUILD research interview with DfT official, September 2015).

There is a strong push for TfL to widen and deepen its engagement in land and property development in order to generate new revenues to fund transport infrastructure and/or services. Consequently, there are few, if any, projects in TfL's capital investment plan that are not linked to economic development, employment or housing. TfL believes that this will enable the organisation to leverage additional private and public funding. While grant funding is still the preferred mechanism, in the current fiscal climate this is increasingly testing, although for major transformational projects central government is still expected to commit resources as part of overall funding packages. While TfL is looking to become 'self-sufficient', the organisation believes that 'transformational' infrastructure schemes will require alternative funding mechanisms, which draw upon finance from a range of different sources.

As infrastructure becomes funded and financed in increasingly financialised ways, different practices, tools, instruments and governance arrangements are being modified or constructed in order to fund and finance local infrastructure. A variety of different infrastructure funding and financing practices have emerged in recent years, many of which blur and/or straddle traditional notions of public-private boundaries (Table 1). We would expect TfL and its partners to adopt some of these practices to suit specific projects and geographical contexts, subject to appropriate fiscal powers and capability being

evident. Some transformative transport schemes will require national government financial backing, in the form of direct grant, infrastructure guarantee or through borrowing. However, the likelihood is that international and national private infrastructure financiers will be reluctant to invest in the early phases of the infrastructure life-cycle of major transport projects:

“Some commentators cite that a “wall of money” from Sovereign Wealth Funds, Infrastructure Funds, Pension funds and other similar investors is available to invest in infrastructure, and that this provides evidence that projects such as Crossrail 2 could be privately financed. While there is no doubt that these investors are keen to invest in infrastructure, Crossrail 2 is unlikely to meet many of their investment requirements. The size of the project, the construction risk, the demand risk and the likely reliance on non-patronage revenues to pay the bulk of the project means that, without direct government guarantees, such investors are unlikely to invest in Crossrail 2”.²³

We would recommend that the NIC examines the 2014 report produced by PwC, which considered the range of different mechanisms and practices that could be used to fund and finance Crossrail 2.

Land (or property) value capture mechanisms offer a potential funding source for Crossrail 2. However, in the iBUILD case study of the governance of infrastructure funding and financing in London, officials that were interviewed were mindful of the ‘political difficulties’ of increasing residential taxation, despite recognising that value capture was the only ‘fair means’ of ensuring that those who benefitted most from Crossrail 2 made the biggest financial contribution. Increasing fares to generate extra revenues is also problematic given commitments by the current Mayor of London to ‘freeze fares in real terms’, and other statements by mayoral candidates. Consequently, additional financial options are being explored, including the feasibility of extending the hypothecated business rate supplement tax that has been funding Crossrail [1].

Finally, TfL and other infrastructure sponsors should consider whether there are alternative quick and cost-effective wins from smaller schemes that could support London’s transport infrastructure and make the overall network more efficient. TfL could perhaps look at whether it is possible to make improvements, such as bringing back sections of unused rail line, to generate additional benefits, as has happened with the London Overground. The engineering consultancy firm, Atkins, makes a similar argument, suggesting that:

“The 2050 [London Infrastructure Investment] Plan rightly makes some ambitious plans for infrastructure provision. However, consideration should be given to whether investment in a greater number of smaller scale interventions could achieve wider benefits”.²⁴

²³ PwC (2014) *Crossrail 2: Funding and Financing Study*, PwC: London, p7.

²⁴ Atkins (2015) *Future Proofing London*, Atkins and Oxford Economics: London, p 88.

5. How have metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

Key messages:

- *Preparation of the London Infrastructure Investment Plan 2050 was an important step in defining strategic priorities, and echoed similar arrangements in other leading UK and international cities. Integrating this with other planning processes provides further opportunities.*
- *A review of over one hundred infrastructure business models by the iBUILD research team highlights the potential diversity of approaches that should be explored to capture more value from local and urban infrastructure.*
- *The ability of London to address its economic, social and environmental challenges, by implementing a wider range of transport infrastructure funding and financing mechanisms and practices, similar to those employed in other international cities, will depend upon the UK government granting London greater fiscal autonomy to raise and retain local tax revenue and increase borrowing for capital investment purposes.*
- *There is a case for a systematic study to be commissioned of how these issues are being tackled in other global cities. Sydney is making new moves to tackle these infrastructure and spatial planning challenges, as is New York and Paris, and there may be common lessons to be learned, which could benefit London.*

We welcome the fact that London has published its first infrastructure investment plan, along similar lines to strategies that have been produced and implemented by other global cities, such as New York, Tokyo and Seoul as well as other UK cities (e.g. the Newcastle-Gateshead Infrastructure Delivery Plan). Lessons from international practice suggest it is important that the London Infrastructure Investment Plan and statutory London [Spatial] Plan are closely aligned, and that the infrastructure plan also fits with local development and planning frameworks in and around the London city region. This requires close engagement, even co-production, between a wide-range of different institutions and actors. iBUILD research has highlighted the benefits of taking a whole systems view to infrastructure by considering integrating with spatial planning policies. For example, reducing demand for services through ‘hidden infrastructure’ such as investment in efficiency measures and demand management strategies reduces consumer bills, frees up capacity to support growth and regeneration, and defers the need for expensive capital investment in new infrastructure (e.g. for new power stations and water treatment works). The National Infrastructure Plan, for example, sets out a pipeline of £65bn investment in energy generation and £45bn investment in energy networks over the coming years. Yet, investing a third of this in energy efficiency measures over the next four decades could free up 12 per cent headroom in generation capacity.²⁵

²⁵ Gouldson A, Kerr N, Millward-Hopkins J, Freeman MC, Topi C & Sullivan R (in review) Innovative Financing Models for Low Carbon Transitions: Exploring the case for revolving funds for domestic energy efficiency programmes. Based on

In terms of funding and finance, London currently spends around 5 per cent of its annual Gross Value Added (GVA) on capital investment while its international competitor cities spend between 10-12 per cent.²⁶ One of the other challenges facing London is that it is still required to secure central government financial or regulatory agreement for major transport infrastructure on a project-by-project basis. And unlike other global city leaders, the Mayor of London and London Boroughs have limited powers to raise their own local revenue (Table 2).

Table 2: Municipal operating expenditures and taxes per capita

	Municipal Operating Expenditures per capita (£)	Municipal Taxes (local and shared taxes) per capita (£)
London – GLA plus boroughs (2011)	3,199	476
Berlin (2010)	4,910	2,570
Frankfurt (2010)	3,577	2,140
New York (2011)	4,561	3,078
Madrid (2009)	1,267	490
Paris (2011)	2,699	1,896
Tokyo (2010)	3,301	2,312

Source: Slack (2013: p5)

On the subject of fiscal decentralisation and global cities, we would direct the NIC towards two useful studies that have undertaken detailed analysis of how London compares to other global cities and city regions when it comes to planning, funding and financing urban infrastructure. The first reference is a working paper written by Enid Slack (University of Toronto) which was commissioned by the London Finance Commission.²⁷ The paper offers an international comparison of the current methods of raising revenues in seven global cities -- London, Paris, Berlin, Frankfurt, Madrid, Tokyo, and New York -- and evaluates the costs and benefits associated with greater devolution of revenue tools to the Greater London Authority (GLA), with Slack suggesting that:

“London would benefit from greater fiscal autonomy – access to a mix of taxes and the ability to set the tax rates. A mix of taxes would give it the flexibility it needs to respond to changing economic circumstances. Local fiscal autonomy and, in particular the ability to set tax rates, is also important for accountability: governments that raise their own revenues and set their own

an earlier working paper: Gouldson A, Kerr N et al. (2014) *Revolving funds for infrastructure business models*, iBUILD Working Paper, iBUILD, Newcastle University: Newcastle upon Tyne.

²⁶ Based on statistics set out by Professor Tony Travers, London School of Economics, in a presentation given to the ‘Developing a Long Term Infrastructure Plan for London’ seminar, Monday 16 December 2013, City Hall, London.

²⁷ Slack, E. (2013) *International Comparison of Global City Financing: A Report to the London Finance Commission*, University of Toronto: Toronto.

taxes to meet local expenditure needs tend to be more responsible and more accountable to taxpayers.²⁸

The second report was published by PwC in 2014, and considers the various funding and financing mechanisms and practices that could be deployed to deliver investment in Crossrail 2, and includes a comparative analysis of how transport infrastructure projects are funded and financed in the following cities: Paris; San Francisco; Atlanta; Copenhagen; New York; Greater Toronto; Chicago; Melbourne and Sydney.²⁹ In the report, PwC concludes that London would find it problematic to replicate some of the funding arrangements employed in other international cities without greater fiscal autonomy:

“Our review of funding approaches used internationally shows that many other cities use a range of property and other taxes to fund transport infrastructure. On the face of it, similar levies implemented in London would be capable of funding a substantial part of the funding requirement for Crossrail 2. However, when we have looked at how such levies have been implemented, many appear to rely on enforcement systems that have evolved over time and in part rely on there being a general level of fiscal devolution across all local or regional authorities. This is several steps away from where London is now in terms of progress towards the first steps of fiscal devolution”.³⁰

Alternative and integrated infrastructure business models

Business models take into consideration different governance, but must also consider the wider infrastructure system that comprises (Figure 3):

- *physical artefacts* – includes the physical links, nodes and components of infrastructure systems such as roads, bridges, pipes and cables;
- *processes* – includes actors, institutions, management, regulation, protocols and procedures that govern the infrastructure over its lifecycle;
- *resources* – includes people, vehicles, water, electricity and data that are conveyed by the physical artefacts and the materials used in the construction of the artefacts; and
- *services* – such as warmth, mobility, sanitation, transportation, welfare services and communication that benefit a wide range of users.

Infrastructure is therefore the artefacts and processes of the inter-related systems that enable the movement of resources in order to provide the services that mediate (and ideally enhance) security, health, economic growth and quality of life at a range of scales.³¹ Moving beyond a narrow or solely economic view and distinct from the world of more conventional goods and services, an infrastructure

²⁸ Ibid, p26.

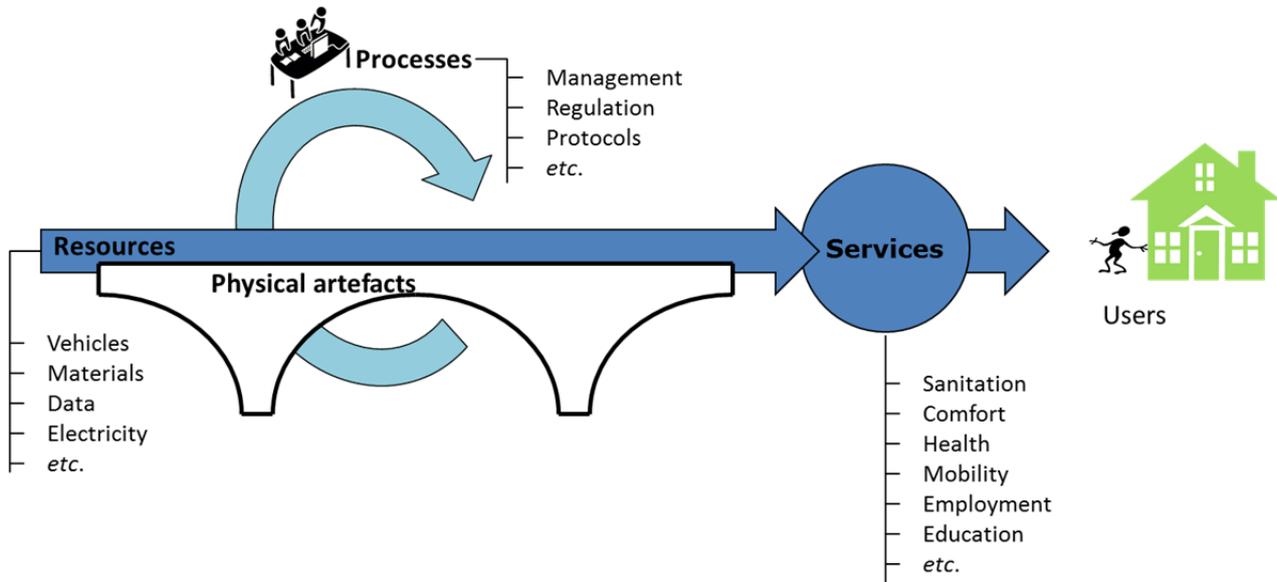
²⁹ PwC (2014) *Crossrail 2: Funding and Financing Study*, PwC: London

³⁰ Ibid, p57.

³¹ Dawson RJ (2013) *Bridges n'that: An infrastructure definition for iBUILD*, iBUILD Briefing Note 1.

business model therefore describes how infrastructure systems create, deliver and capture economic, social and environmental values over the whole infrastructure life cycle.³²

Figure 3: A systems view of infrastructure



Source: iBUILD (2015: p5).

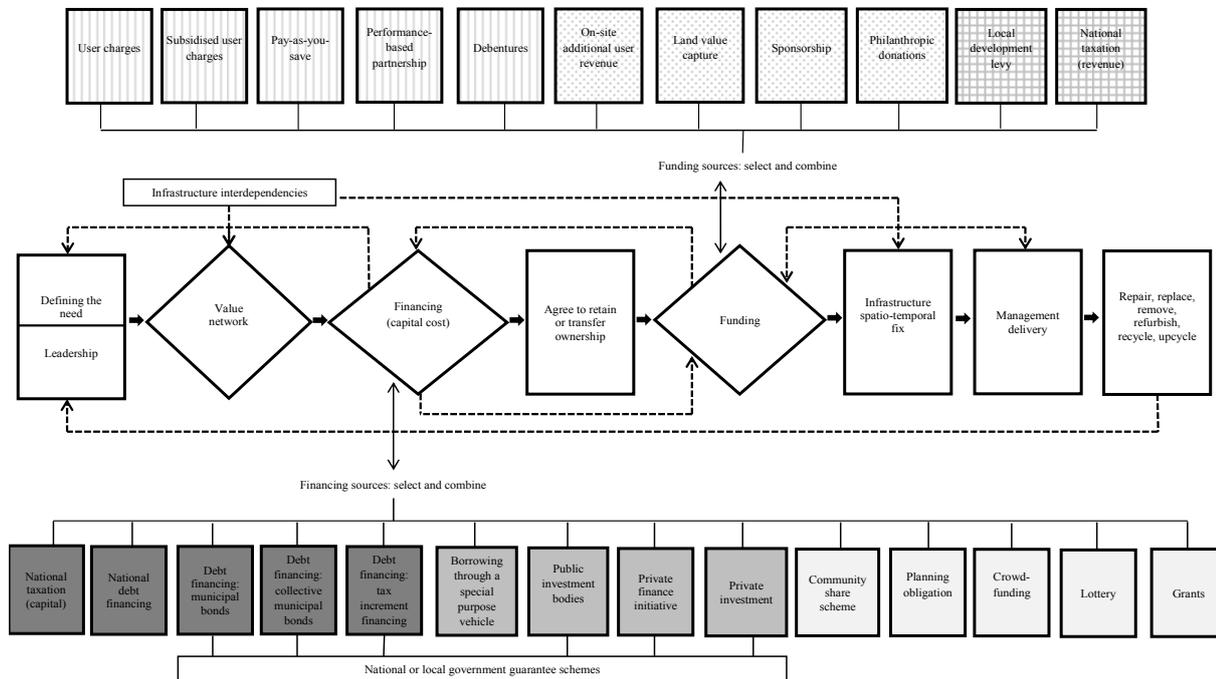
iBUILD has undertaken a review of over hundred UK and international local infrastructure business models, both traditional and non-traditional, across all infrastructure asset classes.³³ The business models are diverse. Value creation includes social, economic and urban regeneration outcomes as well as direct outputs in terms of service supply. International comparison has illustrated how the development of business models from niche to established mainstream models reflects the regulatory, political and socio-economic context (Bryson *et al.*, in review).³⁴ For example, the success of municipal decentralised energy supply in Denmark and subsidy-supported business models for local energy supply in the UK.

³² Bryson JR, Pike A, Walsh CL, Foxon T, Bouch C & Dawson RJ (2014) *Infrastructure Business Models*, iBUILD Briefing Note 2.

³³ Currently online here: <http://ceg-research.ncl.ac.uk/ibuildDemo/> (URL subject to change when site goes fully live)

³⁴ Bryson, J. R., Mulhall, R., Song, M. Loo, and Dawson, R. J. (in review) 'Conceptualising Local Infrastructure Business Models: The Spatio-Temporal Fix', *Research Policy*.

Figure 4: Conceptual Framework of Local Infrastructure Business Models



Source: Bryson et al. (in review).

Developing and implementing alternative approaches provides some benefits, but as noted above, our infrastructures are increasingly interconnected and some of the most promising opportunities are from thinking about delivering what people really require i.e. warmth, light, mobility etc. rather than electricity, gas, roads. This can help identify business models that deliver efficiencies across multiple ‘traditional’ sector boundaries. A rapidly emerging interdependence is between electricity and transport infrastructure – most notably uptake of electric vehicles (EVs). Coupled analysis of energy and transport systems models, has demonstrated that distribution networks could accommodate higher growth in electric vehicles than previous studies have suggested. Exploiting the geographic spread and different timings of EV charging can limit the impact on power infrastructure. Distribution network operators should collaborate with new market players, such as charging infrastructure operators, to support the roll out of an extensive charging infrastructure to make both networks more robust.³⁵

A well-established demonstration of the value of integrated infrastructure thinking applied to an industrial park – now an industrial ecosystem – is the closing of material and energy loops locally with integrated infrastructure in Kalundborg, Denmark. Since 1972, this industrial park has evolved from a single power station into a cluster of companies that exchange materials and energy for mutual benefit as by-products from one business are often inputs for others. For example, treated wastewater from a refinery is used to cool a power station which in turn provides steam for the refinery and a pharmaceutical plant. Surplus heat from the power station is also used for warming nearby homes and

³⁵ Neameh M, Wardle R, Jenkins A, Hill GA, Lyons P, Yi J, Huebner Y, Blythe PT & Taylor P (in press) A probabilistic approach to combining smart meter and electric vehicle charging data to investigate distribution network impacts, *Applied Energy*.

businesses. This has led to substantial annual savings of resources and costs – for example, a reduction in water consumption of 3.3mn m³/year, savings of \$15m from resource sharing and far larger savings by sharing infrastructure have been reported – highlighting how integrated infrastructure business models can produce substantial savings.³⁶³⁷

There are many potential ways of organising and regulating such interactions to create efficiencies. For example, in 1887 in Indianapolis, local civic leaders established a natural gas company as a Public Trust, with an aim to “create the greatest long-term benefit for customers and communities”. Today, the Citizens Energy Group owns and operates a large portfolio of physical infrastructure assets that deliver multiple services including energy, water and wastewater for 800,000 people and thousands of businesses in the Indianapolis area. This has provided community services that are entirely compatible with good financial management. The group was awarded a top rating (MIG 1) by Moody’s credit rating agency in 2014, a reflection, in part, of the strength of the company’s infrastructure business model.³⁸ By recognising the opportunities from the interdependencies of modern infrastructure, and explicitly designing this into our energy and other systems, this not only offers opportunity for alternative business models but also can be used to deliver flexible infrastructure systems that can enhance resilience.³⁹

³⁶ Chertow MR & Lombardi DR (2005) Quantifying Economic and Environmental Benefits of Co-Located Firms, *Environmental Science & Technology*, 39(17):6535 -6541.

³⁷ Chopra SS & Khanna V (2014) Understanding resilience in industrial symbiosis networks: Insights from network analysis, *Journal of Environmental Management*, 141:86-94.

³⁸ www.moody.com/research/Moodys-Concludes-Review-and-Confirms-MIG-1-on-Indianapolis-Indiana--PR_302963

³⁹ Khoury M, Bullock S, Fu G, and Dawson RJ (2015) Improving measures of topological robustness in networks of networks and suggestion of a novel way to counter both failure propagation and isolation, *J. Infrastructure Complexity*, 2(1):1-20.

Table 1: Infrastructure Funding and Financing Practices⁴⁰

Temporality	Type	Examples
<p style="text-align: center;">Established 'Tried and Tested'</p> <div style="text-align: center;">  </div> <p style="text-align: center;">Newer 'Innovative'</p>	Taxes and fees	Special assessments; User fees and tolls; Other taxes.
	Grants	Extensive range of grant programmes at multiple levels (e.g. federal national, province, state, supranational)
	Debt finance	General obligation bonds; Revenue bonds; Conduit bonds; National Loans Funds (e.g. PWLB).
	Tax incentives	New market/historic/housing tax credits; Tax credit bonds; Property tax relief; Enterprise Zones.
	Developer fees	Impact fees; Infrastructure levies.
	Platforms for institutional investors	Pension and Insurance infrastructure platforms; State infrastructure banks; Regional infrastructure companies; Real estate investment trusts; Sovereign Wealth Funds.
	Value capture mechanisms	Tax increment financing; Special assessment districts; Sales tax financing; Infrastructure financing districts; Community facilities districts; Accelerated development zones.
	Public private partnerships	Private finance initiative; Build-(own)-operate-(transfer); Build-lease-transfer; Design-build-operate-transfer.
	Asset leverage and leasing mechanisms	Asset leasing; Institutional lease model; Local asset-backed vehicles.
	Revolving infrastructure funds	Infrastructure trusts; Earnback and Gainshare

⁴⁰ Strickland, T. (2015) Infrastructure Funding and Financing, unpublished PhD thesis, Newcastle University: Newcastle upon Tyne.



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Rail Investment Priorities in London & the South East

This document sets out the author's personal view on possible methods for infrastructure investment prioritisation, built on his experience having been involved in Signalling Supply, Network Rail Major Programmes, and now the Crossrail Programme.

The author has a number of feasibility schemes worked up in more detail, and would be more than happy to share his personal views on incremental investment opportunities targeted at maximising the use of existing rail corridors, if the panel should wish to pursue this.

How should Rail Investment in London be prioritised?

New major programmes, Crossrail, HS2 and Crossrail 2, creating new railway corridors, in the author's view, should be complemented with work prioritised on two bases;

1. Maximising the use of existing rail corridors, such that each two-track commuter corridor is optimised to carry up to 24 tph of up to 12-Car trains in each direction – i.e. to move up to on average 1,500 people x 24 trains per hour = 36,000 people per hour. Investing in existing corridors in priority to complement and integrate with the new major programmes such as Crossrail, HS2, and Crossrail 2 – e.g. improving the feeder networks to these new schemes.
2. Optimising the development of London by considering transport projects as an integrated part of planning permission for new property development, and not allowing existing railway corridors to be constrained. In fact using developer's to assist in the incremental expansion of existing railway corridors to complement the new major schemes.

Which existing railway corridors are constrained, and could be expanded?

Existing railway corridors are typically constrained by not having enough platform capacity to support maximum train volumes, and / or are unable to support longer trains. Examples include:

1. 2 track corridor (The DC Lines) alongside West Coast Main Line between Euston and Watford Junction, used by 6-car Underground trains, and short formation London Overground trains at less than 10 trains per hour in total. The proposed link from the Crossrail scheme at Old Oak Common onto the West Coast Main Line could be fed from services using incrementally expanded DC Lines, releasing capacity at Euston by diverting West Coast suburban services through into Crossrail train paths. A win-win for existing corridor usage maximisation, and an enabler for a more major Euston Master Plan (for example).
2. 2 track corridor (The East London Line) connecting the Brighton Lines to the North London Line, but only used by up to 5-Car London Overground trains, with stations that are too closely spaced, and a service frequency of around 15 trains per hour.
3. 4 track corridor between Loughborough Junction and Blackfriars, planned to be used by just 8 trains per hour for through Thameslink services (mainly 8-Car) from 2018, and having capacity only for 8tph of up to 12-Car terminating services at Blackfriars. i.e. 16tph in total for the 4-track corridor. (Constrained further south by Herne Hill and Tulse Hill approaches which could be changed through combined investment in development in these areas)
4. Brighton Main Lines (BML) corridor, serviced at East Croydon by 8 tracks toward London Bridge and London Victoria, and therefore should be capable of fielding up to 80 trains per hour in each direction (considering some services need to service West Croydon), however with only 6 through platforms at East Croydon, a 4-track railway corridor south of there, and a series of flat junctions and inadequate numbers of platforms for splitting and joining

further south, the BML is constrained to a probable maximum capacity of about 40 tph, or half its potential.

5. 4-track (but 3-track in places) North London Line corridor between Dalston Junction and Euston area, reserved for freight traffic to await paths toward Willesden, and a small number of short London Overground trains per hour passenger services. Could service diversion of traffic from the south end of the West Coast DC Lines corridor, linking in a Thameslink-style fashion through to the East London Line, and the Brighton corridor.
6. Great Northern lines terminating in Moorgate – could be extended through tunnels via London Bridge to link to the Bright Main Lines, therefore delivering another 24tph North South corridor opportunity. Tunnelling activity currently being undertaken in the Bank area might be quite easily extended in the immediate future to create new link required.

What is typical in terms of missed Development opportunities?

In London and the South East up until 2015, with the exception of the new Crossrail development, property development has included very little consideration of the transport opportunities that could be released for the railway corridor. Examples include:

1. The South Bank development at Blackfriars, in which a large residential tower block at the south station will for the next 30 to 50 years block any possibility of access to the remaining old railway bridge piers standing in the River Thames, which could have been used to provide two more terminating platforms for trains from the south arriving at the newly expanded Blackfriars Station. The new towers even include cut-out corners at higher levels for roof garden spaces, yet have no cut-out at bridge level for the railway.
2. The new development at Elephant and Castle has no provision for terminating platforms that could logically have provided a well-connected new southern London Terminus to augment Blackfriars sitting on one of the most underutilised 4-track railway corridors in London.
3. Finsbury Park residential development adjacent to the station on the ECML that is proven (December 2014 debacle) to require major upgrade to increase interchange connectivity.

How could incremental railway corridor improvements be sized and optimised to support new build railway projects?

Railway corridor improvements could be sized and optimised along the following broad rules:

1. Platforms could be extended generally to accommodate 12-Car trains on most suburban lines serving London
2. Where possible, terminal platforms supporting around 4tph per platform face, should be replaced by Through Connections. At Through Platforms with limited interchange, 24tph in each direction can be accommodated with modern rolling stock using ATO (similar to Thameslink Core Area, and Crossrail Central Operating Section), and 18tph in each direction if driven manually – therefore a huge increase on usable corridor capacity. At large scale interchange stations such as London Bridge and East Croydon, 18tph with ATO, and 15tph manually driven would be more supportable timetable planning rules.
3. Railway corridor incremental improvements could be optimised to support and divert commuter numbers away from the places that are being developed in the new build railways – e.g. diverting traffic away from Euston while Crossrail 2 and HS2 are built. I.e. a similar approach to that used when diverting Thameslink traffic from London Bridge to Blackfriars, but on a more effective and larger scale.

4. The application of Digital Railway techniques to increase capacity (as used on the Thameslink Core Area to give +4tph under ATO / ETCS) should only be considered feasible where successive flat junctions and constrained platforms have first been addressed. E.g. with successive flat junctions on the BML for example, it is the author's personal view that it is not possible for Digital Railway techniques to make a large increase in the overall train flow rates, as all that is achievable in practice is bunching up between successive flat junctions and stations.

Examples of incremental improvements for Brighton Main Line corridor:

The following scenario of prioritised incremental railway corridor improvements to support and maximise the usage of the Brighton Main Line gives one example of the sort of schemes that the author would propose:

1. Provision of 6 new platform roads underneath the existing East Croydon Station served exclusively by the London Bridge corridor. i.e. existing above-ground station serves the Victoria corridor only, and underground serves London Bridge.
2. South of East Croydon station, widen the railway corridor to provide for the fly-down connections to the new underground station at East Croydon, thus creating a 6-track approach from the south to both upper and lower platforms. Remodel the junction south of South Croydon station, so as to provide a 50mph grade-separated junction to the East Grinstead lines, and two lines sweeping alongside the allotments to provide a 6 track approach through Purley Oaks, south towards Purley.
3. At Purley, provide 6 platform faces and a 4-track railway corridor toward Coulsdon South for slow-line services, with no platform faces on the Fast Lines.
4. At Coulsdon South provide a 4-track railway corridor in place of the current 2-tracks through the station; 2 non-stopping relief lines in the centre, and moving the platforms to the outside of the corridor. (Fast lines remain unchanged). Relief lines converge just south of the station to run through the deep cuttings and tunnel – i.e. 4-track corridor remains through towards Merstham and Redhill.
5. At Merstham, expand the station to have four platform faces on the Slow Lines, utilising the unused land currently sitting between the Fast and Slow Lines.
6. At Redhill, expand the station to have five platform faces – a new Tonbridge platform to the east of the current station built over the current post office depot, as well as the planned Platform 0 on the west of the station serving the Reigate lines.
7. Provide a grade-separated junction between the Fast and Slow Lines just south of Redhill, before Earlswood Station. Also provide a 12-Car central turn-back platform between the Down Slow and Up Fast at Salfords station, for use during perturbation.
8. North of Gatwick Airport provide a wider northern throat with a 6-track approach, and grade-separated cross-over to allow routing of trains between the Fast and Slow lines to and from the London direction.
9. At Three Bridges, provide 6x12-Car platforms, re-building the currently disused western-most platform face for Up trains from the Horsham lines. Move the siding north of Three Bridges to the centre of the layout between the Fast and Slow Lines to provide a turn-back facility for cross-corridor Depot moves, and provide a grade-separated junction between the Horsham lines and the Brighton Lines north of the turn-back siding.
10. Extend the East Grinstead lines south through the Heritage Bluebell Railway corridor, to Horsted Keynes, and then re-build the dismantled railway between Horsted Keynes and Haywards Heath to re-join the Brighton Main Line. This will provide a cheaper alternative to

BML2 proposals via Lewes, and even allowing for heritage railway traffic, a 2-track corridor extension from East Grinstead could easily support the additional trains envisaged to flow to Brighton in the BML2 scheme. In effect this creates a 4-track railway corridor as far as Haywards Heath on the Brighton Main Line, with 2 tracks via Balcombe and 2 tracks via East Grinstead.

11. Widen the railway corridor to 4-tracks south of Haywards Heath to Wivelsfield, and grade-separate Keymer Junction and remove the level crossing on the Lewes lines by lowering these tracks to pass under the road.
12. While leaving just two tracks through the corridor via Burgess Hill and Hassocks, reinstate the fourth platform at Preston Park, and provide a grade-separated junction north of this station, thus allowing trains from Hove to exclusively serve the 2 western-most platforms, and trains to and from Brighton to exclusively serve the 2 eastern-most platforms.
13. Widen Brighton station by providing 2 new platforms on the eastern-most side where the multi-storey car park is sighted today, providing an increased car-parking capacity below the new platforms.
14. Widen the Brighton throat to allow more flexible approaches, to maximise use of the improved 2-track corridor toward London.

Summary

This document gives a personal view of the author as to how investment in incremental schemes to release capacity in existing railway corridors might be used in an incremental way to feed and integrate with the new major programmes that are proposed in the London Area such as Crossrail and Crossrail 2, as well as the southern end of the HS2 programme.

While the examples quoted above obviously do not work in isolation, the author has thought through a pattern of works and outline feasibility plans which if the panel had time, and was minded, he would be very pleased to discuss in more detail.

It is hoped that sufficient detail has been included herein to give visibility of an overall philosophy that could be utilised in planning and prioritising investment works.

Contact Details:

[contact redacted]

WESTLINK : PROPOSED NEW CROSS-CAPITAL ROUTE

London has historically been served by more main line terminus stations than any other major city, and this has had, and continues to have, huge implications for cross-city connectivity. The major congestion and delays suffered by passengers as they are forced disembark from main line train to already packed Tube train have provided the impetus for development of new cross-city rail routes such as Thameslink, the East London Line and CrossRail (currently under construction). Collectively, these cross-capital lines will have a transformational effect upon London's rail connectivity, and planning is already in progress for the next project, commonly known as CrossRail 2.

CrossRail 2 has grown out of the original proposal for the 'Chelsea-Hackney Tube', first put forward in the 1970s. It is likely to comprise a 'heavy rail' route linking the South Western Main Line near Wimbledon with the West Anglia Main Line near Clapton, possibly with a branch towards Alexandra Palace. The Wimbledon - Clapton trunk route will require around 28km of tunnel, and 9 new deep-level underground stations; a project cost of £15 billion has been predicted. The impetus for CrossRail 2 has recently increased, owing to the congestion likely to arise with the projected development of Euston as the London terminus for HS2. With only the Northern and Victoria Lines available to disperse incoming passengers, the projected alignment of CrossRail 2 has been amended to include a new stop at Euston.

Although CrossRail 2 will undoubtedly bring major connectivity benefits for London, it should not be regarded as the only option to relieve congestion at Euston, or to improve cross-city connectivity on a south-west/north-east axis. This paper puts forward the alternative 'Westlink' proposal for a core route linking Waterloo, Charing Cross and Euston that will deliver far greater connectivity than CrossRail 2, for a fraction of the tunnelled length (and therefore cost).

CLC1 : PROPOSED 'CROSSRAIL 2' CROSS-CAPITAL ROUTE

The 'regional' heavy rail option for CrossRail 2 is shown superimposed onto central London's local rail network. All the length shown on the plan will be in deep-level tunnel, with underground platforms at all stations. As previously noted, around 28km of tunnel (twin bore) and 9 underground stations will be required.

CLC2 : PROPOSED 'WESTLINK' CROSS-CAPITAL ROUTE

Westlink's core section - comprising an elevated connection from Waterloo Station to Charing Cross river bridge, an underground route from Charing Cross to Euston, and a further northward tunnelled extension to Gospel Oak - will allow the Richmond-Waterloo, Bromley-Victoria (via the redundant Eurostar curve at Nine Elms) and Orpington-Charing Cross lines to connect to the Euston-Watford and Gospel Oak-Barking lines. A link to the West Anglia main line at Tottenham Hale will effectively replicate the regional functionality of CrossRail 2. 6 main line routes will be connected, for a total tunnelling requirement of less than 5km.

CLC3 : 'WESTLINK' PROPOSAL INTEGRATED WITH OTHER LOCAL RAIL SCHEMES

Westlink will be fully integrated into London's local rail network. Interchanges are proposed at Queenstown Road / Nine Elms (also serving the projected Nine Elms development), at Kentish Town West (for North London Line), at Harringay (for Thameslink Great Northern), and at Harlesden (for CrossRail extension to Chiltern).

CLC4 : WESTLINK & CROSSRAIL 2: ROUTEING COMPARISONS

The potential networks facilitated by CrossRail 2 and Westlink are shown together, to allow direct comparison to be made. On the basis of the much reduced length of new tunnelled construction, a notional cost estimate of around £5 billion might be made for Westlink, perhaps £10 billion cheaper than CrossRail 2.

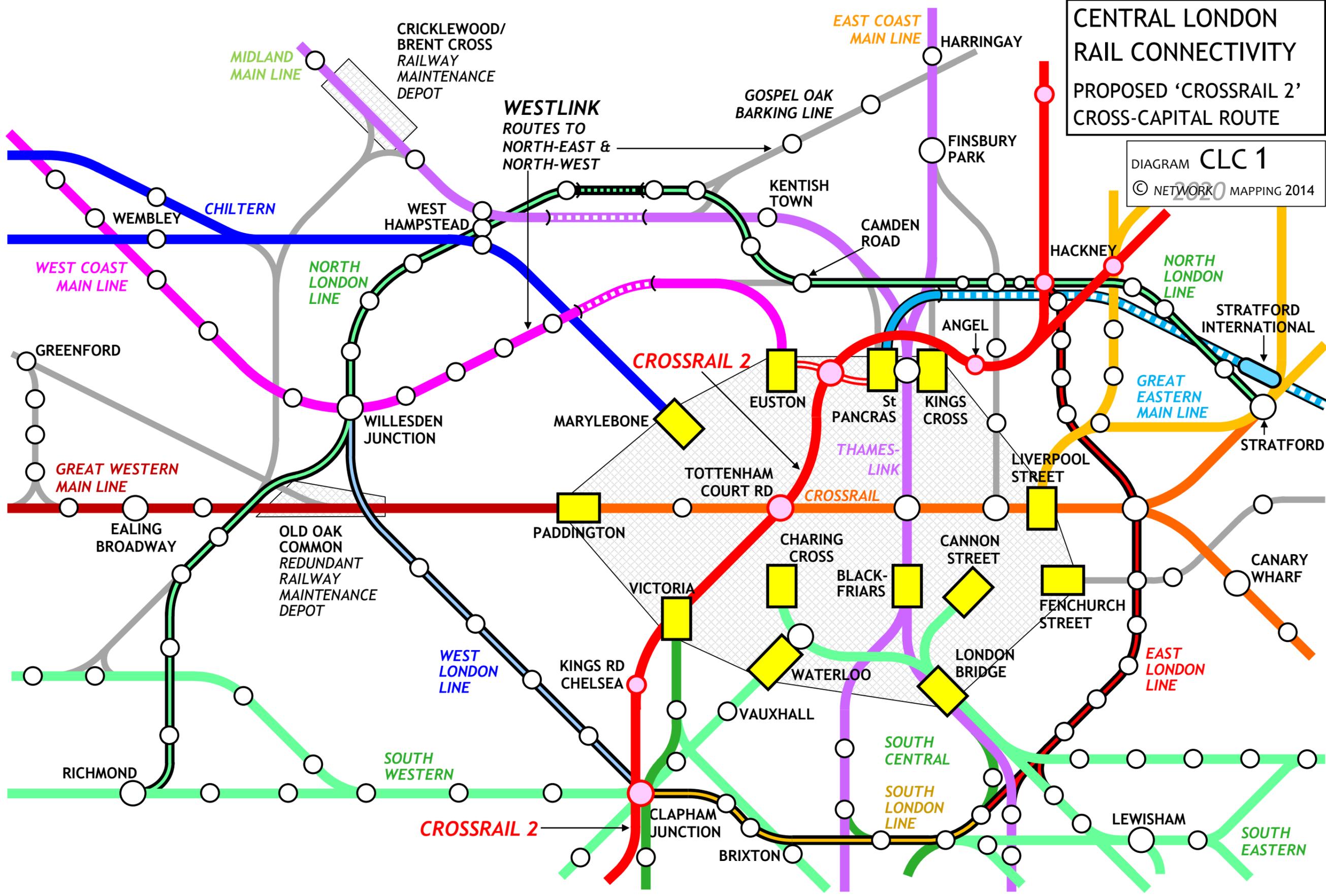
CLC5, CLC6, CLC7 : DETAILED PLANS SHOWING WATERLOO-CHARING CROSS ELEVATED ALIGNMENT

The elevated route between Waterloo and Charing Cross is crucial to the Westlink scheme. The route will enter Waterloo Station via the currently redundant Eurostar terminal, with tracks and structure realigned to continue north on viaduct to connect to the existing line into Charing Cross. The proposed alignment trims the Shell Centre, and this will require major modifications to curve the frontage to align with the new railway. Most of the length of Charing Cross station trainshed must be devoted to the ramp necessary for the new northward tunnelled route to dive below ground level; instead, the Westlink platforms at Charing Cross will be established largely on the river bridge, with major structural modifications required. This presents an opportunity for a direct stair/escalator link to the better-connected Embankment Tube station.

CENTRAL LONDON RAIL CONNECTIVITY

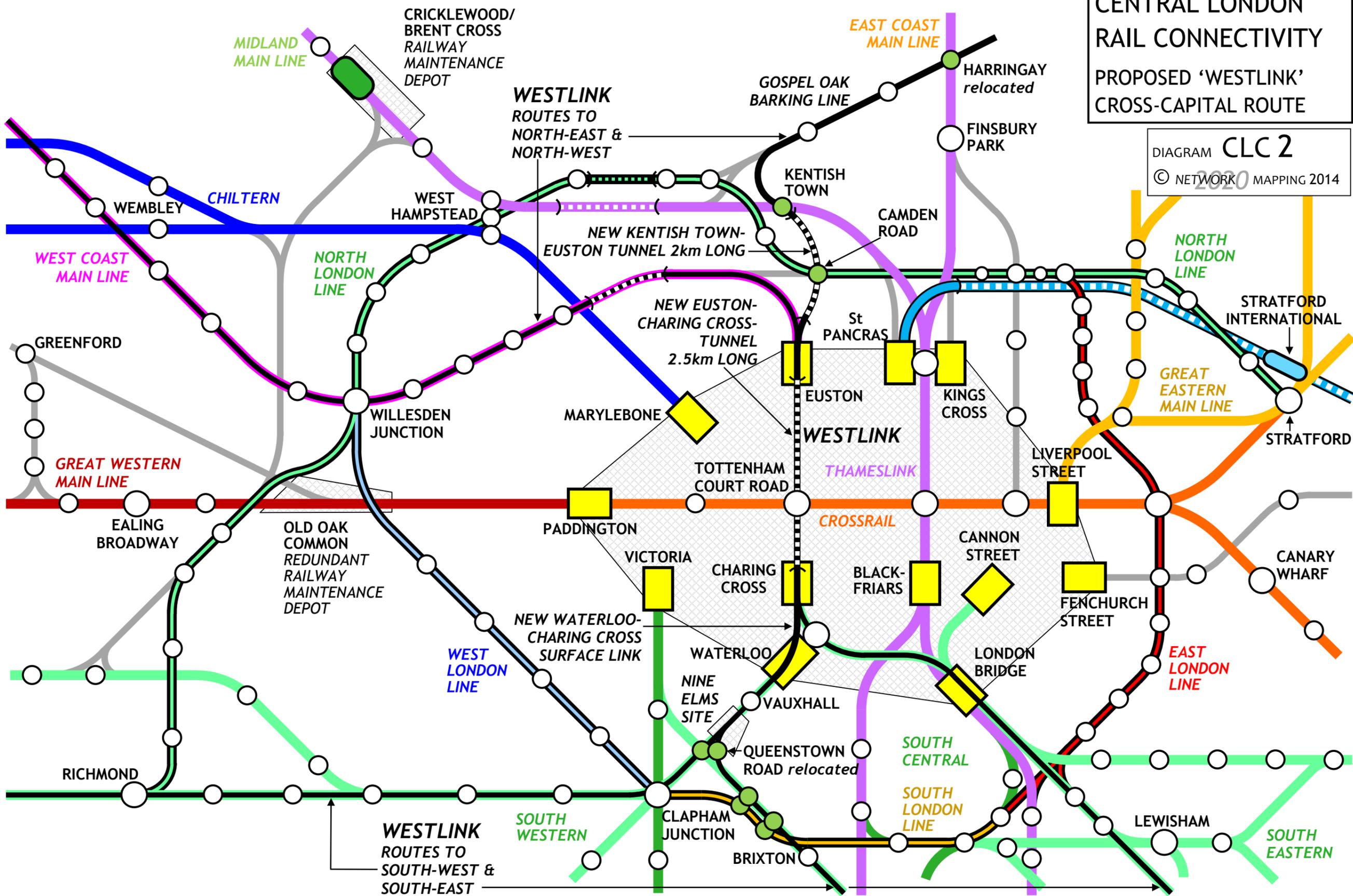
PROPOSED 'CROSSRAIL 2' CROSS-CAPITAL ROUTE

DIAGRAM **CLC 1**
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CENTRAL LONDON RAIL CONNECTIVITY PROPOSED 'WESTLINK' CROSS-CAPITAL ROUTE

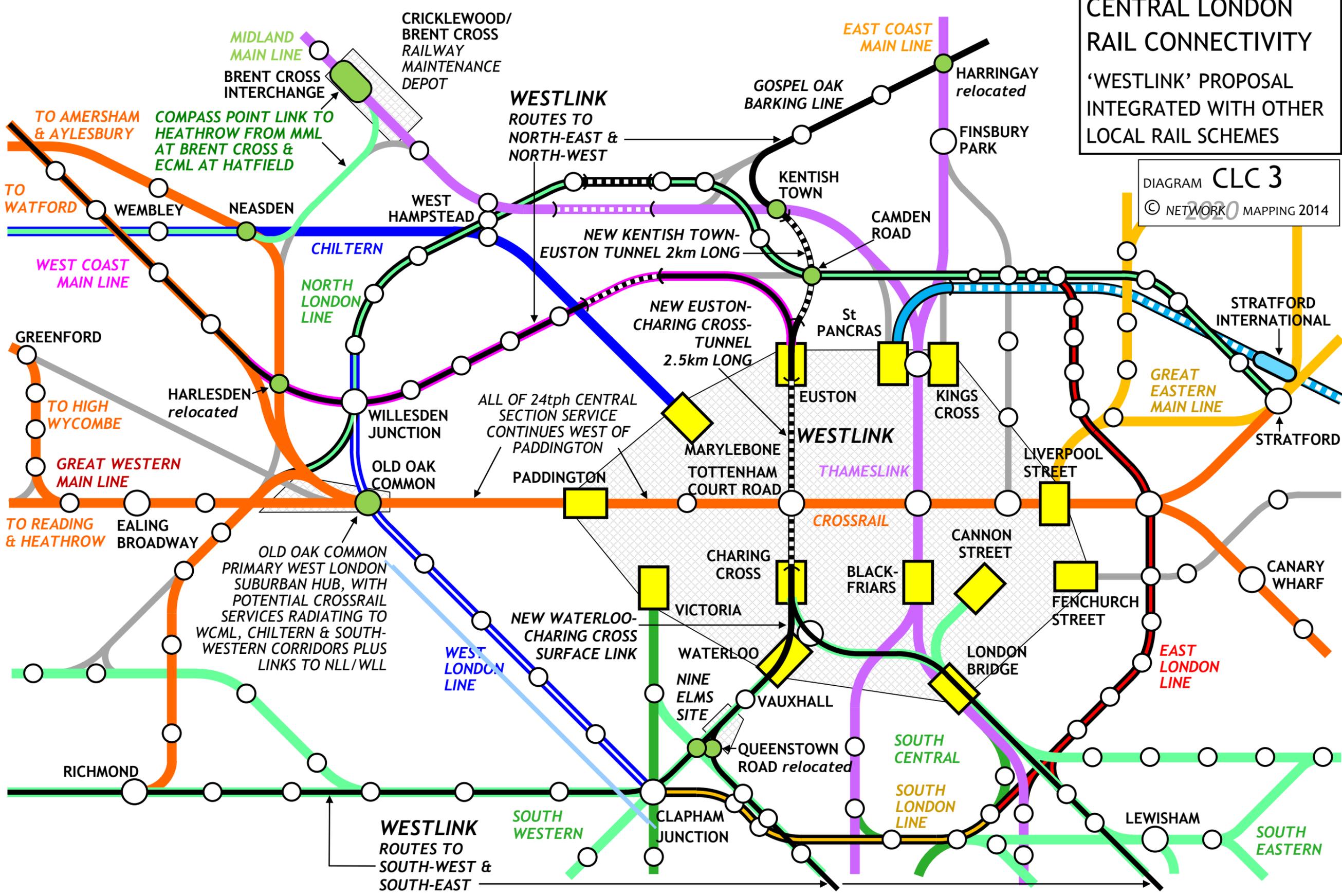
DIAGRAM **CLC 2**
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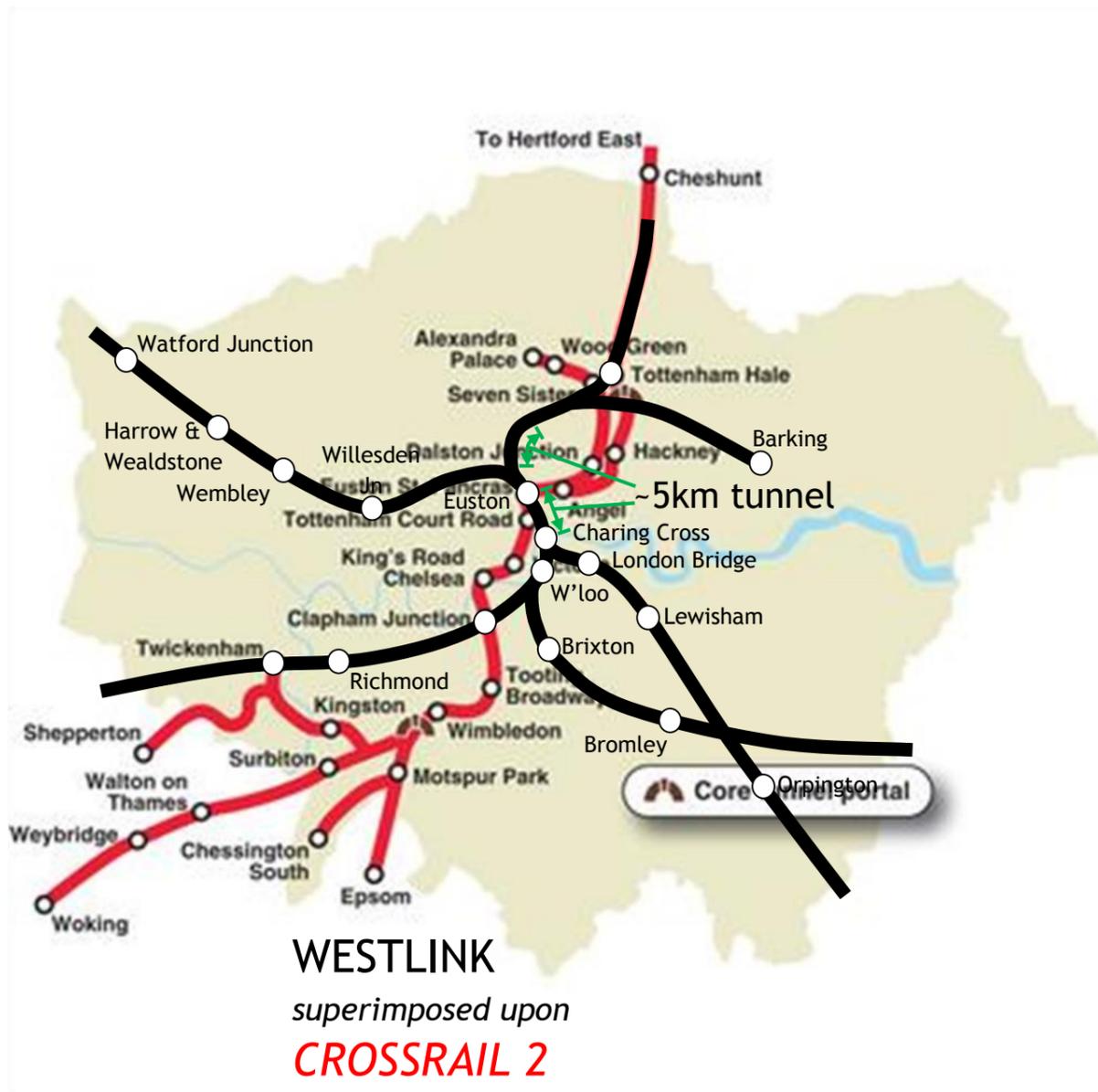


CENTRAL LONDON RAIL CONNECTIVITY

'WESTLINK' PROPOSAL INTEGRATED WITH OTHER LOCAL RAIL SCHEMES

DIAGRAM **CLC 3**
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WESTLINK & CROSSRAIL 2:
ROUTEING COMPARISONS

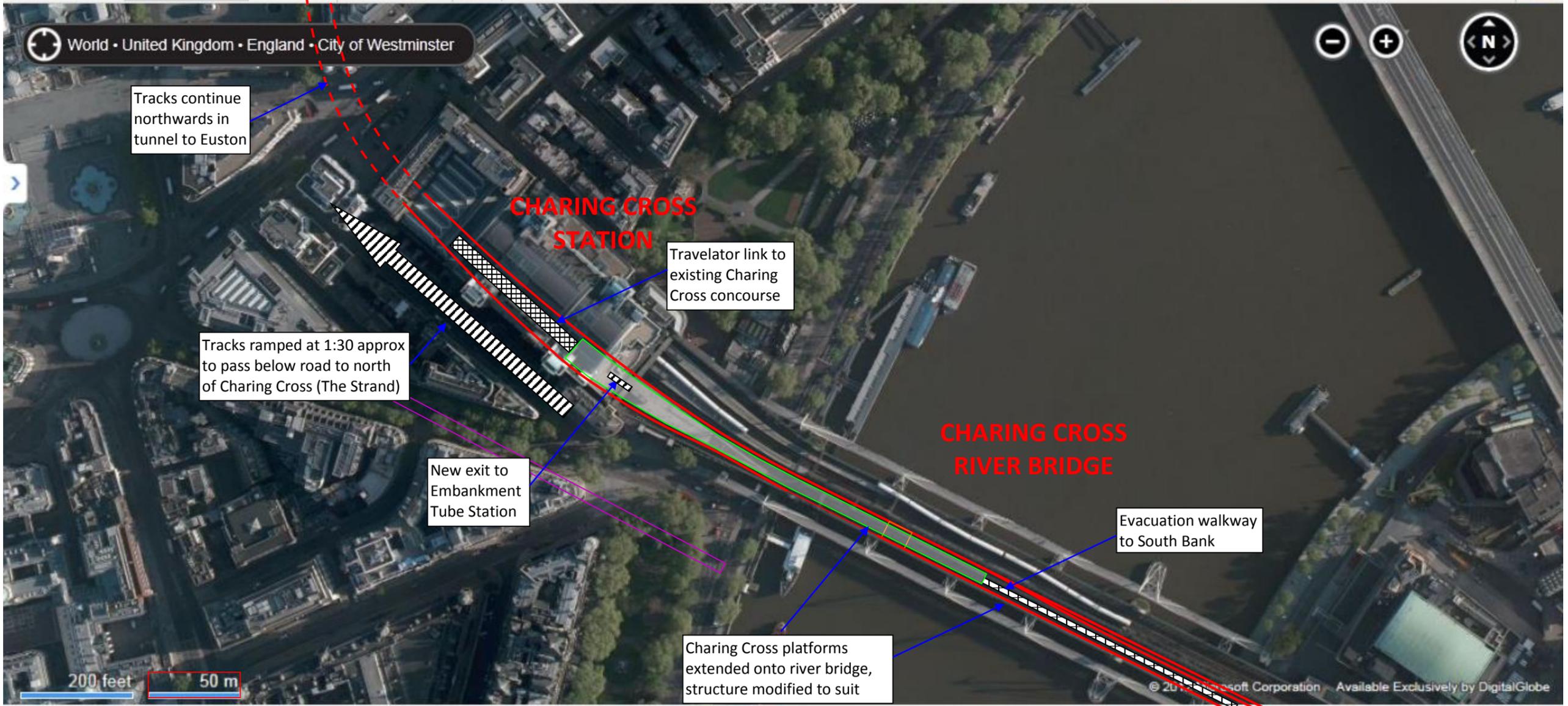


DIAGRAM **CLC 5**
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WESTLINK :
 PROPOSED WORKS FOR TUNNELED ROUTE
 NORTH FROM CHARING CROSS STATION

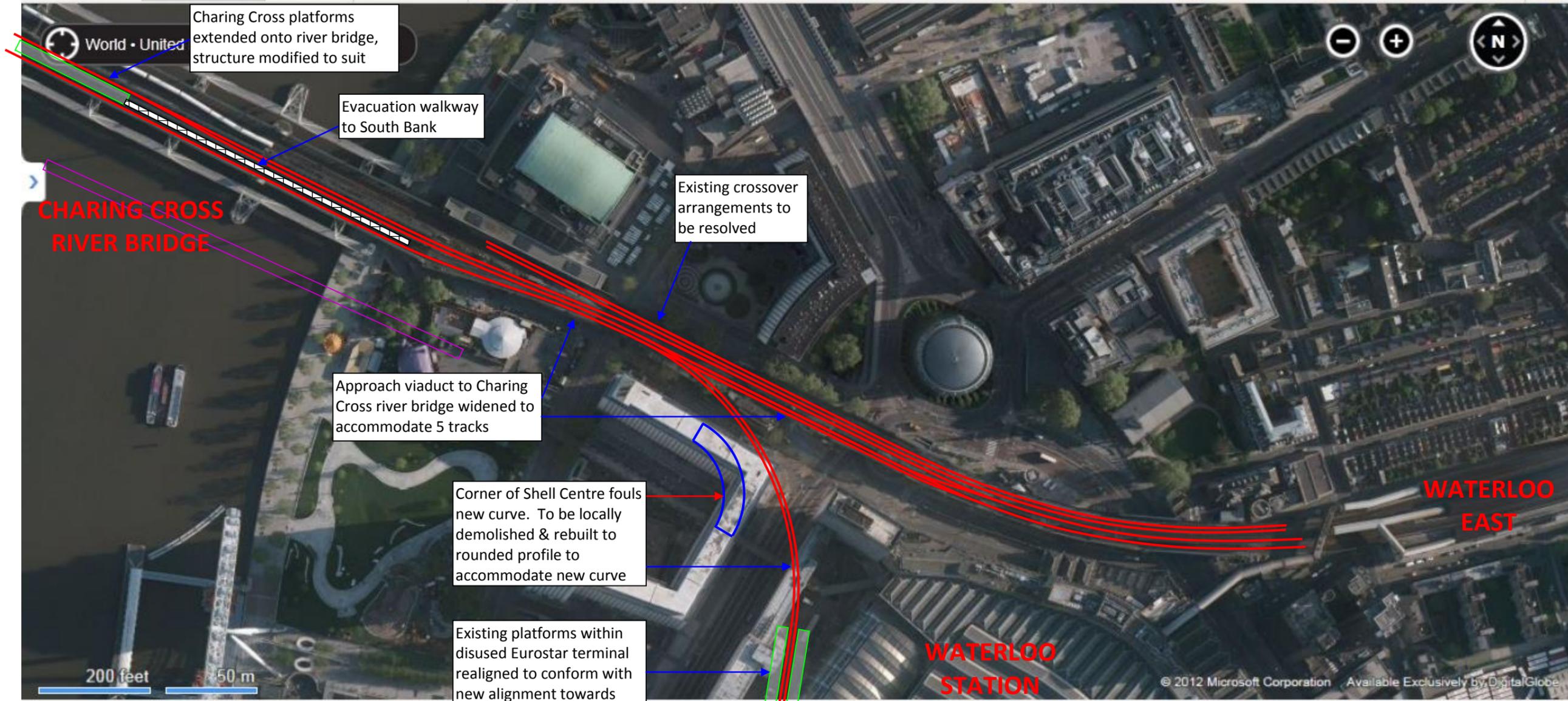


DIAGRAM **CLC 6**
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WESTLINK :
 PROPOSED WORKS ON SOUTH-EASTERN APPROACHES TO CHARING CROSS BRIDGE

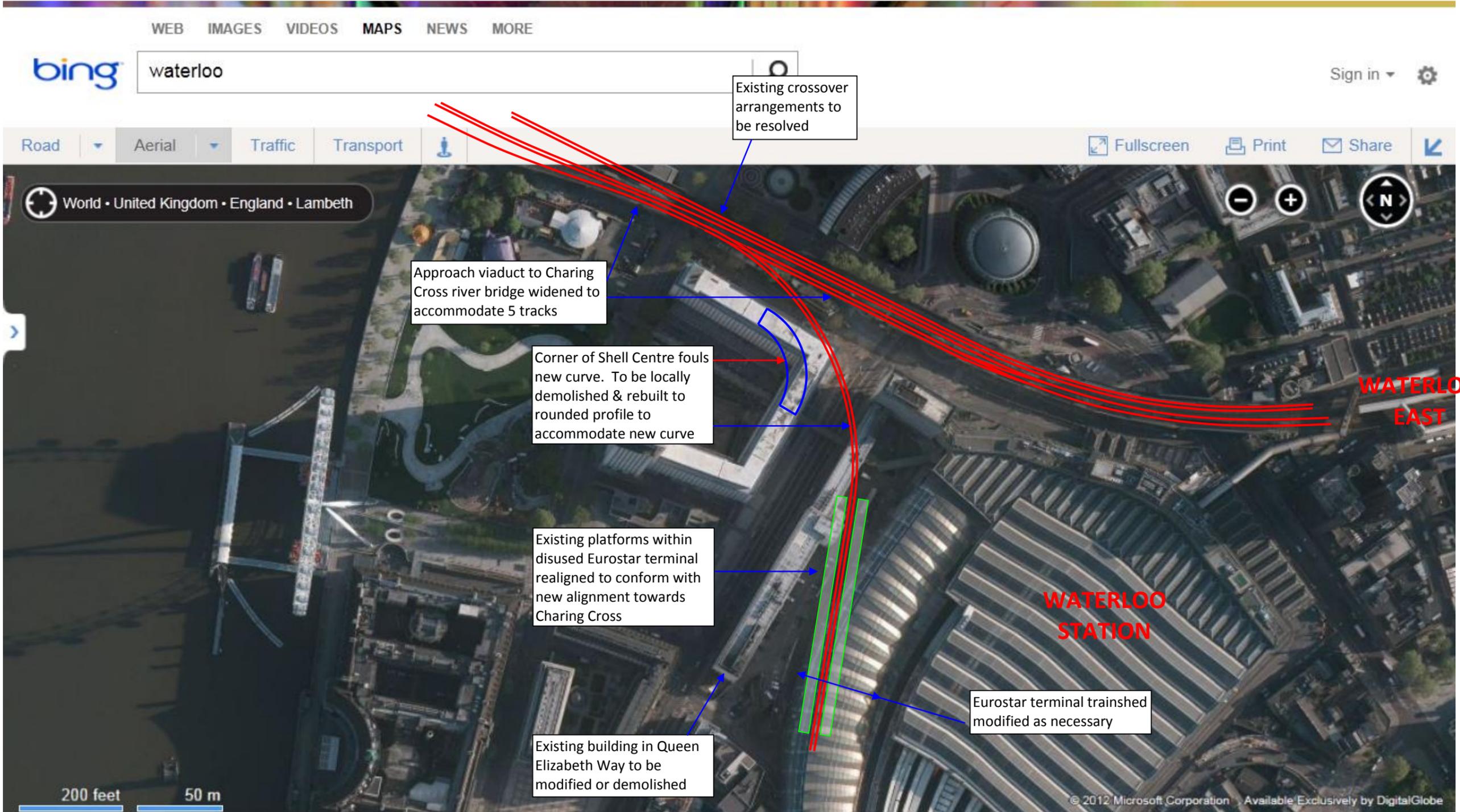


DIAGRAM **CLC 7**
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WESTLINK :
 PROPOSED WORKS FOR NORTH SIDE
 ENTRY INTO WATERLOO STATION

The case for investment in Light Rail in London

[contact redacted]

About the author: [redacted] is a transport analyst. He worked at the Confederation of Passenger Transport (CPT), representing light rail and tramway operators. Before that, he worked on public transport at the Transport Research Laboratory, including a study of the light rapid transit and urban development and on the effects of rail investment in Tyne and Wear and Glasgow. Since retiring from CPT in 2012 he has continued to work with UKTram, and represents the UK on a EU-funded study of urban tram safety in Europe.

The National Infrastructure Commission has called for evidence on three major national challenges:

- Improving connectivity between cities in the north of England,
- Large scale transport infrastructure improvements in London,
- Improving how electricity demand and supply are balanced.

This paper addresses the second of these challenges and examines the case for investment in light rail and modern tramway systems in London.

What light rail can do

Light rail, and in particular a street-running modern tramway, is a modern transport mode which uses vehicles which run on rails but which are lighter than traditional rail vehicles. This enables higher acceleration and deceleration, steeper gradients and sharper curves than on a railway. Hence stops and stations can be closer together, providing a better urban public transport service. The capability of running in the street, either on its own right of way or mixed with road traffic, means the infrastructure can be lighter and less intrusive, requiring less in the way of bridges and tunnels which, of course, makes it less expensive. Light rail is normally driven by electricity, making it non-polluting at the point of use and able to use power generated from sustainable sources. Also, modern trams generally allow level boarding, which makes boarding easier for people with disabilities.

A modern tramway can carry between 4000 and 10,000 passengers per hour in each direction (pphd). This means it has a much greater capacity than a bus service, which is limited to about 3000 pphd by the need to stop, start, load, unload, accelerate and decelerate. In a large city, buses do not provide adequate capacity.

Several cities in the British Isles, including Manchester, Sheffield, Dublin and Edinburgh, have installed modern tramways. They are successful at carrying large numbers of passengers, attracting car drivers, and promoting urban regeneration. In London, the tramway in Croydon and the Docklands Light Railway (which does not run on-street but is classed as light rail) have both produced similar benefits.

The case for light rail in London

In this paper we look at the scope for light rail investment in London.

Currently, London is experiencing a great deal of investment in its rail services. Crossrail is being built and will carry passengers between Paddington in the west and Liverpool Street in the east from 2019. Crossrail 2, linking the north-east and south-west, is under development. Extensions are planned to the Bakerloo and Northern lines, and the Docklands Light Railway undergoes continuous development. In recent years, sections of underused rail lines have been linked together to form the Overground network, serving mostly circumferential routes. These improvements have been, or have the potential to be, very successful.

Of course, rail improvements are enormously expensive, and, as this paper shows, do not serve all needs. We believe that public transport investment can also be effective at a more local level, providing short-distance, readily accessible, public transport both in central London and in district centres in the London area.

Why London needs efficient rail transport

We start with the observation that London is a large city. This is obvious, but London is by far the largest city in the United Kingdom, and can be classed as a world-class mega-city, one of only two in Europe (Paris being the other).

Large cities depend on rail transport to bring people and goods into their city centres. One has only to see what happens when rail services in London are disrupted by strikes or weather: people cannot get to work and the city could not operate for long. Of course, London already has a good many rail lines. The Underground brings 3 million people into the capital every day, and the suburban railway brings another 1 million. In the course of a year, the Underground carries more than 1 billion passengers, as many as the whole of the national rail network.

Large cities also depend on rail to carry passengers within their city centres. The city centre of London – defined broadly as Zone 1 or the area within the Circle Line – is too large for walking. This makes London different to other large cities such as Birmingham or Manchester, where it is possible to walk across the centre in 15 minutes or so. London needs an efficient public transport network within the city centre.

Central London is of course served by the Underground, but even with the fairly dense network of lines in the centre, it does not serve all the major corridors. Furthermore, the time taken for a passenger to descend to the platforms and back to the surface makes the Underground inefficient for short journeys. Hence, many central area journeys are made by bus, and there are many intensively-used bus routes. But buses get delayed in traffic, and on some busy corridors they struggle to cope with the demand, as a bus corridor cannot operate at more than about 30-40 buses per hour.

Another feature of the size of London is that it encompasses a number of district centres which are sizeable centres in themselves. The London Borough of Croydon claims that if Croydon were not “embedded” in London, it would be Britain’s 8th largest city, surpassing Coventry and Wakefield. It is not alone; there are other

district centres such as Stratford or the Richmond-Kingston area which could make a similar claim. Such centres need their own public transport networks, and the density of their transport corridors means that buses alone will not suffice.

We would argue that there are busy corridors, both in central London and in district centres, which would be better served by a modern tram service, with vehicles that can carry up to 200 passengers and, given the right priorities, can provide a shorter end-to-end journey time. A modern light rail or tramway system would provide a more efficient transport system, less costly than Underground or suburban rail improvements, but able to cater for busier corridors than buses can.

Suggestions for where light rail should be considered

Where would such corridors be located? It would of course be for Transport for London to look at current flows, do the modelling and identify corridors for improvement, but we make some suggestions here.

Light rail in Central London

Firstly, in central London, the corridor from the **Euston-Kings Cross area to Waterloo** station is one of the busiest, but it is not well served by the Underground. A few years ago there were well-developed plans for a tramway called the Cross-River Line to serve this corridor. It would run from Waterloo, across Waterloo Bridge, and then follow Kingsway and Southampton Row to Euston before turning right along Euston Road to St Pancras and Kings Cross. North of Kings Cross, the line would serve Camden Town, and south of Waterloo it could be extended to Peckham or to Clapham Junction, relieving the overcrowded rail lines into Waterloo. The line was forecast to carry about 70 million passengers per year, more than any other tramway in Britain. **We recommend that the plans for the Cross-River Line should be re-instated.**

Secondly, **Oxford Street** has been identified as one of the busiest corridors in London. It is served by many bus routes, but there are so many buses that progress is slow – very often, it is quicker to get off the bus and walk. It is also served by the Central Line and will be served by Crossrail, but with only 4 Underground stations and 2 for Crossrail this hardly constitutes an efficient local service. A tram service between, say, Holborn and Marble Arch would provide better connectivity for Oxford Street shoppers, and it could be extended to Paddington to serve the mainline terminal. One drawback to the earlier Oxford Street tram plans was where to locate a depot, but that could be accommodated by integrating the Oxford Street tram line with the Cross-River Line and using a joint depot south of the river or in the Kings Cross area. **We recommend that the plans for an Oxford Street line should be re-examined.**

Thirdly, there are no Underground lines serving travellers between **Victoria and Paddington**, via Hyde Park and Marble Arch. Another heavily used bus corridor is that between **Victoria and the City**, via Parliament Square, Trafalgar Square and

the Strand. These corridors could benefit from light rail investment. **We recommend that TfL should examine the case for light rail investment on these and other densely-trafficked routes in central London.**

District centres in London

Among district centres outside central London, Croydon and Stratford are just two examples where investment in light rail could improve local transport. Neither is a rich area, and there are many people in these areas who are not well-off, or are even deprived. Their lives are far removed from those of the well-paid people who work in the City or shop in the West End, areas which they seldom visit. People in east and south London depend on public transport for access to employment, shops, schools and leisure facilities, and businesses depend on it for their employees and customers. Investment in public transport would be beneficial on many levels.

We have already identified **Croydon** as a centre which requires good public transport. There is an existing tramway in Croydon which links Addiscombe and Beckenham Junctions to Central Croydon and on to Wimbledon, carrying large numbers of passengers. **We recommend that the various plans for extensions to this system, including one to Crystal Palace, should be pursued vigorously.**

In east London, **Stratford** is a rapidly developing area with a large shopping centre. It is already well-linked to central London and other centres by public transport, with suburban rail, two Underground lines and two Docklands Light Railway lines. But Stratford depends heavily on buses in several corridors, notably eastwards along Romford Road and to the north-east towards Leytonstone. **We recommend that these corridors serving Stratford be examined with a view to installing light rail lines.**

In addition, there are other district centres within the London conurbation which have similar needs. Examples could include the Tottenham-Wood Green area, the Wembley area, and Kingston-upon-Thames and Richmond where a tramway could be developed to link with Croydon. **We recommend that all such areas which are currently served by heavily-used bus routes should be examined for possible light rail investment.**

Conclusion

In this paper we have suggested some areas, both in central London and in other centres within London, which should be considered for transport investment. Grand projects such as Crossrail and Underground extensions are fine, but they are expensive and take many years to develop; also, they do not necessarily provide the local accessibility that public transport needs. A modern tramway can provide high capacity transport which is safe, reliable and readily accessible to passengers, at a much lower cost than heavy rail or Underground investment. **We recommend that TfL examine the options described in this paper and others where light rail would be beneficial.**

Future investment in the London's transport infrastructure

Submission from: [contact redacted]

I do not wish to comment directly on future investment in the London's transport infrastructure.

That said, I do wish to **highlight the long term neglect of land drainage maintenance that leaves transport (and other) infrastructure liable to and at a steadily increasing risk of flooding.**

Very briefly.....

When the Environment Agency took over from the National Rivers Authority in the mid 1990's they disposed of the River Thames dredgers upstream of Teddington. Disposal facilities were closed and dredger operators dispensed with.

The £110m MWEFAS flood alleviation scheme was then constructed. On first use in 2003 the Jubilee River suffered severe structural damage. In spite of £5m in repair costs it is unable to convey its design capacity and is still falling apart today. The Thames downstream of Windsor flooded badlyin 2003 and twice in 2014.

The Environment Agency's current River Thames Scheme flood alleviation project is costed at £302m at 2009 prices. I have no doubt that this will be a £1bn if the project gets completed in 2025.

In my opinion this project is flawed in the same way that the Jubilee River was. The Environment Agency is unable to learn!

The really big issues are.....

- 1) The EA has no legal duty to maintain or improve the conveyance capacity of designated main rivers – so it doesn't.....
- 2) There are approximately 100 blocked flood arches upstream of Teddington – used as offices, workshops, warehouses etc. These reduce the discharge capacity of the system.
- 3) I have explained the problems to the EA and stated that..... if they implement the River Thames Scheme..... if they are lucky they will only flood Staines. If they are unlucky they will flood London.

Please feel free to contact me for further details

[redacted]26/11/2015

LONDON'S TRANSPORT INFRASTRUCTURE

Contribution to

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London – on road, rail and underground – including, but not limited to, Crossrail 2.

Introduction

In 2018 there will be two major infrastructure events, the opening of Crossrail and Thameslink, the biggest such schemes since the Channel Tunnel and Rail Link, and the upgrading of the West Coast Main Line.

The next major project to follow these is HS2. Due to open between 2026 and 2033, this dwarfs the other schemes. It will provide fast interconnection between many of the major cities of the Midlands and northern England. It will also free up urgently needed capacity on the existing main rail lines, rapidly increasing passenger numbers and freight.

The objective now must be to fully utilise the potential these projects have created. There are many transportation needs to be met, constrictions to be alleviated and pollution to be reduced. With tight budgets, integrated forward looking infrastructure planning is the only way to proceed.

The Elephant in the Room

Looming over much of Greater London's infrastructure forward planning is the lack of a decision on an upgraded or new hub airport capable of meeting the long-term needs of long distance travel; the elephant in the room.

The Airports Commission have recommended adding a new north west runway at Heathrow adequate to meet demand up to 2050. The Government have deferred a decision accepting these recommendations until a proper study of the impact of expansion on air quality and noise levels. Aircraft noise pollution already inflicts unacceptable misery on hundreds of thousands people in London who have repeatedly been told that new quieter aircraft will bring relief; the Airports Commission report shows otherwise. Even more serious for Heathrow's expansion is air quality. If studies show it is likely to exceed legal limits, then expansion cannot go ahead.

The Airports Commission admit their alternative solution, expansion at Gatwick, will not result in an adequate international hub for UK's economic future. The only real alternative to an expanded Heathrow, the one the Commission rejected, is the Thames Estuary site on the Isle of Grain. This was presented as having an unmanageable capital cost, partly due to the need for extensive new transportation infrastructure. This needs to be examined objectively in relation to the needs of other proposed developments in the same area.

Thames Gateway Regeneration Zone

The Regeneration Zone stretches forty miles along the estuary from Canary Warf in London to Southend in Essex and Sittingbourne in Kent. This concept is aimed at expanding London's economic activity along the Thames Estuary encouraging business enterprise, employment and new housing by providing improved infrastructure. It has succeeded beyond anyone's expectation in the Docklands at the western end of the Zone. It is undoubtedly in need of an employment catalyst to spread it eastward, together with improved rail and road links such as the extension of Crossrail eastward from Abbeywood and the construction of a Lower Thames crossing proposed to alleviate the lack of capacity at the Dartford Crossing on the M25. This will also overcome the barrier to economic activity between Kent and Essex.

London is desperately in need of additional affordable housing, either within the Greater London Area or outside with adequate commuter links. Thames Gateway Regeneration Zone can offer this once Crossrail is completed and the south spur extended.

The Employment Catalyst

It is hard to imagine a more effective catalyst to set in motion the regeneration of the Thames Estuary than the construction of a new hub airport on the Isle of Grains. There is only need for one hub to serve the UK and for a new one to succeed economically, the closure of Heathrow is a prerequisite. Employment priority would be given to Heathrow staff who are prepared to move near to or travel to the new airport. It can be anticipated that well in excess of 50,000 new jobs will be available for people living in the regeneration zone. A lower Thames crossing would spread the benefits to Essex.

Lower Thames Crossing

The Dartford Crossing on the M25 is already operating close to capacity. Studies have been carried out to compare providing extra capacity at Dartford with two alternatives further down the Thames. The appraisal report "Review of Lower Thames Crossing Options, April 2013" discarded the middle route. The lower route leaves the A2/M2 junction east of Gravesend and crosses the Thames east of Tilbury joining the M25 between junctions 29 and 30. Improvements to the A229 linking the M20 and M2 were also considered but were found to be very expensive for such a short road. The crossing and M20-M2 link are presently being studied on its own merits. In the event that the hub is to be constructed on the Isle of Grain, consideration should be given to building the link further west where it could also act as the main access route to the airport for airport traffic originating west of junction 5 on the M25.

Consideration should also be given to a combined road and rail crossing structure, although a separate rail tunnel will probably prove more economical.

Airport, Rail and Road Access

Heathrow has grown over the years with poor rail access, encouraging unacceptable levels of road usage, contributing to air pollution and congestion on roads leading to the airport. Closure of Heathrow would help solve both problems.

Infrastructure already in place would mean that rail links to a new estuary airport can be world class with little extra investment cost to be set against the airport alone.

- The extensions of Crossrail beyond Gravesend would provide a high capacity frequent service. Travel times of under one hour from Old Oak Common and ten minutes less from Tottenham Court Road would be expected.
- An airport link to HS1 would allow provision of express services in under half an hour on the “javelin” trains to Kent from St Pancras and Stratford. These trains are presently running 6 carriages whilst 12 are allowed for in the train design and platform length. The track has been built to UIC GC loading gauge which allows for double-decker trains which are being increasingly used on the Continent. There is definitely adequate latent capacity to meet the need for express travel to the airport. The two halves of the “javelin” trains can be separated automatically allowing even more flexibility.
- Of equal importance to the London links is the possibility to establish fast rail travel to other parts of the UK. With HS2 in place, many of the major cities of the north, Midlands and the west can be provided with a through service to the airport in under two hours. The main capital expenditure will be a direct link between HS2 and HS1. With this in place, up to four HS2 trains per hour could bypass Euston and stop at Stratford for Docklands, at Ebbsfleet to connect with Eurostar services, and terminate at the hub airport. There would be no loss of capacity to serve London, as passengers for other destinations could change at Old Oak Common onto Crossrail, avoiding poorly connected Euston. Passengers from the west would join at Old Oak Common.
- It has been assumed that HS1 has a maximum capacity of 16 paths per hour in both directions between St Pancras and Cobham before the Medway crossing. Of these, six could be allocated to Eurostar, six to “javelin” services and the remaining four to HS2. Beyond Cobham, there would be a lot of extra capacity allowing for freight services which would have to join the Kent lines into London, or use a new rail link to Essex if one is built. This would tie in well with the new London Gateway Port and Logistics Park already in use downstream of Tilbury. There would also be capacity for trains from the Continent to what could become one of the world’s best airports for range of international connections.
- The rail route to Waterloo, in use for Eurostar services before Phase 2 of HS1 was built, could be reinstated to provide an adequate semi-fast service to Waterloo. There is an extra-ordinary provision in the costs presented in the “Airport Commission’s Inner Thames Estuary Airport Summary and Decision Paper, September 2014” for a new express rail service from Waterloo via Barking Riverside bringing their enhanced rail package provisions to £26.9 billion! This, together with estimated road improvements of up to £17.2 billion, adds a £44.1 billion infrastructure bill to the airport development without any attempt to discuss what would be built in the without airport scenario. This approach to dismissing an apparently unwanted project would surely be more in place in a script for Yes Minister than a document intended to decide the long-term provision of hub airport capacity in the UK.

- The above rail access would be more than adequate to support a hub airport with capacity to meet demand beyond 2050. The demand on road access would be reduced to a much more manageable level than at Heathrow. A further route could be added if a rail tunnel is built at the Lower Thames Crossing. The north-eastern Crossrail line could be connected to the airport by a line from Romford or Brentwood. This would provide additional capacity but, even more important, would add resilience to rail access when maintenance is carried out on other lines.
- Thameslink, the proposed Crossrail 2 and the existing rail network could play an important part in providing acceptable linkage to the airport from the zone outside Greater London.

HS1 – HS2 Link

An HS2 Phase 1 report, Review of HS2 – HS1 connectivity and Rail Links to the Continent – November 2015, is now available. It suggests numerous tunnel alternatives that could connect the two lines, plus several involving passengers leaving HS2 trains at Euston and walking or being carried on travellers to St Pancras.

The only realistic solution which meets the simple requirement for HS2 trains to join HS1 and terminate at the airport is a variation of option R6. The pair of rail tunnels from Old Oak Common would bifurcate near Chalk Farm, with one pair to Euston and the other pair joining the HS1 line north of St Pancras before it enters the tunnel to Stratford. The bifurcation would be of a similar design to that already built on Crossrail near Stepney Green. The report rightly points out the difficulties this solution would meet at the St Pancras end, but probably no more difficult than those recently solved by Crossrail. The Thameslink canal tunnels completed recently under St Pancras should provide useful information on shallow tunnelling in the area.

Closure of Heathrow

The closure of Heathrow is inevitable if a new hub airport is built. Airport staff will be seriously affected if they are not able to move to the new airport unless good transport links are available. A grade separated interchange between the Great Western lines/Crossrail and HS2 at Old Oak Common would serve this purpose for a few years until HS2 and HS1 lines are fully utilised.

Many businesses have located near Heathrow to take advantage of the freight services it can provide. A freight consolidation and distribution centre should be retained there with a fast and frequent rail freight service established, if possible, to reduce road haulage between the two sites. Heathrow airport site, with its forthcoming Crossrail services, will be a prime site for commercial and residential development.

Overview

The delay in deciding whether to proceed with a third runway at Heathrow is a major impediment to preparing a long-term plan for London's transport infrastructure. However, this review suggests that most of the components needed to support a change in location of UK's hub airport, if it occurred, are already being actively progressed to meet other identified needs.

The only scheme warranting immediate action is the HS2-HS1 link tunnel. This should be studied in detail so that it could be built with HS2 Phase 1. Any other approach would be very short-sighted and hugely disruptive for adjacent rail services.

There is real need to reduce the strain on commuter trains into London and improve access to areas of more affordable housing which is rapidly disappearing from Inner London. Crossrail 2 can play a major part in this at a high price. This is inevitable for any scheme requiring long tunnels under London. A useful intervention would be a study covering the Greater London area and commuter links to identify which routes could carry double-decker trains without excessive infrastructure rebuilding.

The author regrets only noticing the call for submissions shortly before the closing date, otherwise a more polished presentation could have been made.

[name redacted]

Dear Sirs,

I consider that one of the aims of the NIC should be to link projects that can support each other or generate synergies, create economies of scale, or pursue other national or regional priorities as a byproduct, thus "killing two birds with one stone" and leveraging funding in the best possible way towards desired outcomes.

In particular, I am anxious that all future tunnelling projects should be linked with land reclamation schemes, so as to maximise the land available for other uses that are needed, including housing development or other infrastructure.

I would draw to your attention that spoil from the British sector of the Channel Tunnel was used to create an extension to the cliffs of Kent known as Samphire Hoe, which is now a unique habitat, nature reserve, public open space and tourist attraction.

Given the pressure on land for housing, green infrastructure, food production, energy infrastructure etc., I consider it vital that spoil from Crossrail 2, a Trans-Pennine Tunnel, and other similar schemes be used for seabed land reclamation in or near to existing cities or towns so as to create new footprints for high-value coastal housing schemes with sea views. The proceeds of sale of such housing would subsidise the original project, and it would help to meet the housing imperative without taking any greenfield land.

Yours faithfully,
[redacted]

Response to Infrastructure Commission Call for Evidence: Questions relating to Greater London:

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

Lack of housing, especially affordable housing within reasonable travel distance of employment and services.

Dependence on the private car, especially away from Inner London and, resulting from this:

The concomitant wasteful use of land (for roads and parking) that should otherwise be used for housing, other beneficial uses, biodiversity and flood mitigation;

Lack of opportunity (and safety) for walking, cycling and public transport, all of which would contribute to public health through less obesity, better air quality and less premature morbidity and mortality with significant effects on the costs of health care.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?

There have been far too many reports that have been shelved (e.g. the two immediate Post-War railway reports following the Abercrombie Plans, of which only a few fragments have been built, the proposals half a century ago for what is now Crossrail 1, the Bakerloo Line Extension, expected in the 1950s, and the inordinate delays on Thameslink "2000"). IMMEDIATE starts should be made on

- The elimination of bottlenecks on the radial rail network (e.g. E Croydon, Welwyn Viaduct, Clapham Junction and Woking [please see below])
- The provision of orbital or tangential routes serving outer London suburbs, town centres and locations beyond, on the model of Croydon Tramlink, and the provision of railway lines to improve connectivity (e.g. the Croydon link)
- The transfer of funding from increases in road capacity to public transport and traffic management, including the improvement of environmental conditions in neighbourhoods through the rigorous enforcement of (low) speed limits and restrictions on obstructive pavement parking etc.
- Crossrail 2 regional scheme and bringing forward radial line improvements such as reinstating four tracks in the Lea Valley and additional tracks on the SW Main Line.
- The safeguarding of land in rail corridors for improvement (e.g. if true, the reduction of the rail formation under Earl's Court on redevelopment to two tracks is incredibly short-sighted, given the likely capacity pressures on the West London route).
- Cross River provision downstream of Docklands to link **rail** services for passengers and freight north and south of the Thames (rather than the current preoccupation with road traffic crossings).
- Planning for a direct through link from HS1 to HS2, so that Old Oak and Stratford can play a fuller part in distributing national London-bound traffic, and direct Continental services can be provided from Birmingham and Manchester without stopping in London – both relieving Euston and bringing the "Northern powerhouse" to reality, rather than just adding to Central London congestion.

I also advocate in particular an orbital link for West / South West London which I have put forward in the SW Route Utilisation Strategy consultation – please see the **Appendix** to this note, which considers some of the wider issues related to the M25 corridor in this sector.

What might their potential impact be on employment, productivity and housing supply in London and the southeast?

Although the Commission is not including Airports in the request for comments, it has to be faced that a wrong decision here would make infrastructure provision well-nigh impossible. In particular, the huge housing demands from increased economic activity that a third runway at Heathrow would require would be unsolvable. The public's resistance to the development that would be needed on the green belt and beyond (including AONBs) and the near-certainty that air quality considerations would mean lengthy legal challenges would result in a collapse of planning in west London and beyond and affect London's performance as a whole. (It must be recognised that the Heathrow T5 Inquiry was unequivocal that T5 should be the last major airport development there).

Conversely, the early use of land currently blighted by proposals for the third runway for housing and integrated transport (building on present routes like Crossrail 1) could go a long way to make an impression on the SE's current long-term housing supply deficit, and safeguard areas beyond Greater London from over-development likely to be unsupported by infrastructure which is currently fairly poor.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Better integration with regional rail routes, e.g. Lea Valley / Stansted and SW Main and Suburban routes, to reduce congestion at London termini and provide more journey possibilities, plus widening as suggested above.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

- What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?
- What innovative funding mechanisms could be considered to support delivery of key schemes?
-

From the land development of the first Metropolitan Railway, through the development of the New Towns, to the proposals for infrastructure financing worked out for example in the Cambridge Growth Corridor in the late 1990s, many proposals have been made for how development might be financed, mostly involving the capture of future land value benefits to assist current development. Proposals along these lines have been made by many of the professional Land and Planning bodies, who can be expected to be presenting them to you. The obstacles seem to be more "political" philosophy than practicality!

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

I do not have direct information on these issues.

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Appendix:

The following response to the Wessex Route Study Consultation, made in February 2014, considers the application of some of the issues raised in the Commission's questions, and makes a specific proposal for an orbital rail route to improve infrastructure in the SW and W London and the M25 Corridor.

1. This is an individual response by a resident of Woking. I have a particular interest in the consultation as I am a retired town planner who has had direct responsibility over the years for, *inter alia*:

- Strategic planning, environmental and planning appraisal techniques for large infrastructure projects and sub-regional plans
- The interrelationship between transport and land use, including the geographic and time – accessibility of different modes of transport
- Specific policy issues relating to the needs of industry, the roads programme and rail freight (including at one time re-writing the Freight Facilities Scheme Manual)
- Working (successfully) to bring forward the proposals for South Hampshire electrification by identifying socio-economic benefits, so that the scheme was implemented earlier than originally proposed by the then railway authorities
- Regional planning – including RPG3 (London) and RPG9 (for the wider South East). This included ensuring that strategic reference was made in RPG3 to Crossrail and Chelsea-Hackney (when transport colleagues in government were advocating dropping both!)
- Housing demand and supply in these regions and subsequently the national growth area proposals
- The 700 conditions attached to the Heathrow Terminal 5 decision (as part of the T5 decision team).

2. I am not a railway industry expert, so please forgive any misuse of railway terminology in this response (I have however been a close follower of modern railway matters for over 50 years, and a regular rail and rapid transit user). However, I would like to record at the outset that the consultation document is admirably clear and readable.

3. This response concentrates on the SW Main Line and the potential for an outer orbital London rail service, for this is where I believe the greatest challenge and opportunities lie. Following general observations on the Study as a whole, I advocate the early implementation of:

- Grade separation and additional platforms at Woking and
- An orbital route from Guildford to west London via Heathrow, mainly on existing tracks or following the M25 – which I have termed “Airtrack plus”

General observations:

4. The Route Study appears to be concentrated on the current problems of congestion and ways to squeeze capacity out of a system running at a level which is less than wholly resilient (giving no room for even minor upsets in service). There is clearly an operational and “political” need to address this, but the danger is that opportunities for growth in rail usage and coverage are ignored. Major

timetable changes, new stock and train lengthening has ameliorated conditions more recently for the outer suburban services, (but often at the expense of frequencies of the inner suburban, as a comparison with published timetables from 50 years ago will show). Nevertheless, as is well recorded in the Study, overcrowding is rife and action is needed beyond mere tinkering even to maintain the status quo amongst a growing population.

5. What the Route Study underplays is the potential for further growth in rail traffic if current constraints on journeys (including journeys that cannot at present be made by efficient public transport) were eliminated. Transport demand modelling – and to some extent the current franchise system – tends to concentrate on existing flows and congestion, and underplays the potential for new journey opportunities. Derived demand approaches completely ignore the established contribution that, for example the “tubes” gave to the development of the London suburbs and the Metropolitan Railway did for “Metroland”. Planners have long known that improvements in accessibility can bring increases in usage. The growth of traffic on the SW main line has been well recorded. Past capacity increases have stimulated growth – the effect of electrification of the Southampton line and resultant reduced journey times was particularly marked in the Twentieth Century and stimulated commuting and development along the corridor.

6. Today there is a welcome recognition of the development opportunities of new transport links – redevelopment around Crossrail stations being an example – but transport planners still tend to belittle attempts to create new markets. An example is the history of the Overground, which, when first mooted (as RingRail) in the mid C20, was rubbished by transport planners as having no demand and by railway operators as completely infeasible. Indeed, transport planners at the time were seriously contemplating using the trackbeds of the supposedly redundant lines for urban motorways [I was involved in assessing the quite devastating impact of these routes]. The work of the new Deputy Mayor and others in the more recent GLA facilitated the development of the Overground, and its attractive services have led to the original concept being overwhelmed by passengers, so that trains and platforms have needed to be lengthened and frequencies improved.

7. A simple example of suppressed demand today is Clapham Junction, where the non-stopping of Main Line trains throughout the peak means (from timetabling and platform constraints) that otherwise entirely feasible journeys to such major traffic attractors as Croydon or Inner West London just cannot be made from main line stations as the interchange is not possible. Here, the issue of current capacity and future opportunities overlap – as dealing with one could unlock the potential and generate increased traffic (and revenue) to a wider range of destinations.

8. I would like to see an immediate Improvement of Clapham Junction. Pending a major rebuild, urgent consideration should be given to the conversion of the current Up Fast line to Fast Reversible, with platform extensions and the relief of severely restricted turnouts to platforms 7 and 9 to enable a reasonable number of peak hour direction main line services to call there (and be overtaken by non-stopping services if necessary). This should take place irrespective of the decision on Crossrail 2 (I support the earliest implementation of the regional scheme and additional tracks west of Wimbledon.)

9. A more difficult, but pressing, issue is the traffic opportunity of outer orbital services, represented (by road) by the M25 corridor, which in my view is an opportunity for rail waiting to be grasped, preferably immediately (please see below).

10. Capacity restrictions also inhibit the construction of new stations, on which the Study is silent. I assume that they have been ignored, from the statement given in section 3.6 *other conditional outputs*. However, there are significant opportunities for enhancement of the connectivity benefits

of rail and of attracting traffic at such locations as Burpham and Park Barn (both in Guildford) and these should be included as an early planning aim. These two, from the point of view of the local areas served, are well overdue. Others should be investigated, for example, Stoughton (Guildford) and Sheerwater (Woking – in tandem with current regeneration proposals).

11. It is understandable that, given the physical restrictions on train movements, train lengthening is the first resort of operators (or more fanciful ideas such as double decker carriages as expressed in section 6.3). However, lengthening is probably reaching its practical limits for suburban services, whilst it should also be remembered that the attractiveness of public transport in suburban areas increases as frequencies increase. (Waiting and Interchange times are “valued” more than in-transit time). A Turn Up and Go service is necessary to be attractive to users, as seen most dramatically on the growth in traffic on the London Overground and some “Metro” services. It is therefore encouraging to see the Study examining the potential for enhancing the services over the day. Southern Electric managers considered 20 minutes to be the maximum waiting time without journey planning using timetables. In today’s faster, more instant, world, a frequency of 15 minutes or less would seem essential for non-rural services.

12. Most of the significant proposals of the Study are over the longer term, yet, as we have seen in the past, rail planning has been bedevilled by delays, prevarication and abandonment. The post war plans for cross-London RER main line tubes following Abercrombie (the Greater London Plan) were never implemented (e.g. main line tube F became a watered down Jubilee Line, the Northern Line New Works including taking over some SW suburban branches were abandoned). Major proposals for two E-W lines in the London Traffic Study were forgotten, and – as I mention above – Crossrail was very nearly abandoned too. It is clear from the Study that the current – welcome – proposals for capacity are quite insufficient to provide a resilient service for just the current passenger forecasts – let alone suppressed demand – and that major capacity increases are required immediately. Comparisons with the provision of infrastructure in other World Cities show London and the SE to be incredibly slow, notwithstanding the fact that where there is a will, infrastructure can be implemented relatively quickly (the DLR and Overground extensions being examples).

Relief of congestion at Woking

13. I believe that the flat junction at Woking largely determines the pattern of rail services on the entire SW Main Line, and it seems highly unlikely that the service through this junction could be improved without major work. As the Study points out, existing services through Woking are already seriously overcrowded. Without commitment to improvement at Woking, the only possibility for the SW Main Line (long distance services) seems to be the diversion of a few of these at Basingstoke to Paddington, building on the freeing of capacity on the GW Main Line by the rebuilding of Reading and the platform space at Paddington freed by Crossrail. Whether this could provide an adequate level of capacity without further major expenditure seems doubtful, and would do nothing for the growth in traffic over the Portsmouth, Alton and Basingstoke Line corridors. The construction of Platform 3 at Woking has been a palliative for terminating services, but entails conflicts with the fast lines and additional congestion on the approach to Woking, as many travellers already experience.

14. Woking is therefore the key to both improved rail services throughout the SW Main Line and the additional services needed to support Surrey and Hampshire. There is an additional opportunity to use this capacity to facilitate an orbital service meeting the unmet demand for access to Heathrow and the West of London (see below). In addition, planned proposals for development in Guildford,

Woking and the Blackwater Valley will add to travel demands. Significant commercial and residential developments are already proposed in the sub-regions, recognised in the Local Plans (emerging or adopted) for the area. It is very doubtful whether this level of growth can be sustained on the basis of road traffic alone without severe environmental and congestion implications, themselves fuelling strong opposition to any proposal for growth.

15. The draft Surrey Rail Strategy set out various proposals for additional rail services using the SW Main Line, but none would appear feasible without increased capacity at Woking (with the exception of a proposed terminating service into Platform 6 from Gatwick).

16. I therefore strongly support the Study's proposals for capacity enhancement at Woking by a flyover and extension of Platform 6 to be a through platform (section 6.1), but would advocate consideration of further enhancements, specifically the provision of, or passive provision for, a second additional through platform. Work on this should start as soon as possible.

17. Although development has encroached on some land that might be used for major improvement – which can be seen as incredibly short-sighted by both the past rail authorities and the planning authority – the potential still exists, helped by the fact that the Victoria Way bridge is multi-tracked, and there are abundant railway lands around the station area. It seems perfectly feasible for two new platforms to be located on the southern side of the station on the the up side, continuing the existing Platform 6 track and adjoining siding. In order to reduce impact on the Centrium residential complex, the platforms would begin at about the site of the present booking hall, but would extend over railway lands in the London Direction. (If necessary, appropriate screening of these approach tracks could take the form of a “green roof”.) There may be issues on the historic façade of the booking hall, but this could probably be rebuilt and incorporated in any new development. There is considerable potential for development over the station.

18. Proposals already exist in principle for a new development at the station to provide a bus interchange. Woking Borough Council has an entrepreneurial approach to development, as seen in the extensive proposals for further development of the town centre, and development of the airspace above the station could contribute significantly to its enhancement. A local advantage of any development could be the replacement of the totally inadequate public subway under the station by a convenient over-deck starting at grade from the existing station forecourt, leading to access to the town centre by escalator or lift and incorporating an over-track concourse (itself facilitating retail opportunities for the railway).

A proposal for an orbital railway for Outer West London –“Airtrack Plus”

19. The study refers in passing to the Southern Rail access to Heathrow (section 2.1.5), but in my view misses the much greater case for an orbital rail service, based mainly on existing tracks to link major traffic generators throughout the SW and W London sectors. At present, it is almost impossible to move around Outer SW and W London without going by private road vehicle. There is constant pressure to widen the M25, and the issue of air pollution (see below) is additional to the carbon contribution of road traffic, which is significant in contributing to climate change. The almost total dependency on roads also has considerable repercussions for the structure of the Western and South Western approaches to London, with spreading congestion adding to business costs and sprawl inhibiting efficient and sustainable land use patterns. This is not just a Heathrow issue, but one that affects all the major traffic generators and town centres in the sub-regions.

20. There may be a procedural difficulty, in that consideration of an orbital service is wider than the remit of the SW Trains Alliance, and falls into the category of cross boundary services (chapter 4), which clearly do not exist in this corridor at present. However, improved rail access to Heathrow and beyond is long overdue, and should be seen as a component of a transport strategy to facilitate orbital movements by integrated public transport - movements which can only at present be made by private road transport (with the exception of the rail air coaches which provide a minimal premium service to small numbers of passengers between the airport and selected stations). Moreover, the key to such a service is capacity at Woking and around Staines – both SW Trains’ territory.

21. In addition to the geographical attractions of giving access to major traffic generators – which is recognised in in the Study as “conditioned outputs” to existing stations but not potential new services – there is the issue of externalities and benefits, which do not seem to have been explicitly considered. There is a very strong case for including in any work on rail service assessment the many environmental benefits delivered by electric railway – from less polluting power supply to lower land take than other forms of transport. The main motorway corridors are significant contributors to poor air quality in outer SW London. There are dangers in underplaying the polluting effects of transport, and not just in respect of breaching European Directives designed to minimise the harm to the health of the population. The Environmental Audit report (HC212) in its recent overall conclusion, states:

Urgent change is needed in transport and planning policy to save lives and ensure that the UK meets European safety targets much sooner than the expected dates indicated by Defra. Air pollution is an invisible killer and a public health imperative. A fresh approach is needed for the health challenge we face, coordinating action by local authorities and communities as well as the Government.

An effective orbital rail service taking traffic from the M25 in particular would go a long way to mitigate the adverse effects of unrestrained road traffic in this sector of the South East.

22. Air quality is of particular concern in the area around Heathrow. It is not generally known that Heathrow T5 only just received planning permission. Senior officers of the government departments concerned considered that there was a very high risk of successful legal challenge from opponents, because of the effects of the environmental impacts of the terminal and its associated infrastructure. In particular, the combination of aircraft and road traffic had a wholly unacceptable result on air quality. This was resolved in the ministerial approval by the requirement in the planning conditions of an air quality management plan. It was also envisaged that some of the pollution from road vehicles would be mitigated by the transfer of trips to rail. In addition to the requirement to extend the Heathrow Express and Piccadilly Lines, specific provision was given in the conditions for a provision in the T5 station box for rail access to the west / south west, where the current modal split was particularly poor. In the event, the rail access was not constructed and air quality remains appalling in the M25 and M4 corridors. (The relevant files were declassified on the publication of the T5 decision and should have been kept as a historical record of the longest inquiry.)

23. Over the years, various proposals have been made and abandoned for rail access to Heathrow. SWELTRAC, Airtrack, the Western Connection and others have been made. These proposals have been seen as a means to serving the airport alone, not for more general travel, so they had limited objectives and potential. Airtrack in particular was conceived as a small addition to the existing infrastructure, with links to Guildford and Staines. It was not surprisingly abandoned in the light of the opposition of local interests in Egham and Staines objecting to more frequent closures of level

crossings, and the limited scope for services - curvature of the track at Staines and Virginia Water, the inherent limited track capacity of the Windsor lines through the junctions, and the almost complete lack of capacity at Woking meant that it would never have been a sufficiently attractive service, especially at commuter rush hours. However, the need has been recognised for years, and is there now, not in some far flung control period future.

24. A revived, but extended “Airtrack Plus” route as part of national railways (not an airport concession), serving destinations both south and north of the airport would have two benefits:

- It would mitigate the pollution caused by the road traffic emanating from Heathrow in the short term, as well as providing an alternative to road traffic over a much larger area (including the opportunities for easy interchange to the main rail radial lines)
- It would provide a resilient solution to movement around the West and South West of London in the medium to long term. Whether or not Heathrow was extended, it would provide rapid and frequent services across a wide catchment to HS2 at Old Oak Common (and then proposed development area around it), as well as facilitating future urban development over the Heathrow site (or land to the north of Heathrow) were Heathrow to be wound down.

In addition, if Crossrail 2 goes ahead, and / or Waterloo and its approaches are remodelled, relief will be needed during the period of construction to the South West Main Line, which could be provided by services via “Airtrack plus” to inner West London and, if necessary, Paddington.

25. Whether or not Heathrow expands, there will be significant demand in the M25 corridor for access from the west and south west for the foreseeable future. Even if the Airports Commission does not recommend an additional runway at Heathrow, the existing airport will continue to be busy for years, and modal split from the west and south west is already very poor – a high quality rail service would be attractive. On the chance that (as the London Mayor and some strategic planners such as the TCPA have suggested) Heathrow is wound down in the longer term and replaced by a new town, the significant housing and commercial development would provide many traffic opportunities for rail in all directions – not just to central London (as at present). The background “planning parameters” for an orbital railway are therefore very robust.

26. I therefore propose a semi-fast orbital rail service from Guildford via Woking to Watford Junction and Brent Cross (and other destinations) as suggested in the annex below. The proposal is compatible with possible through running of Crossrail to Staines or any SW Trains Southern Airport access arrangement, as well as any possible Crossrail branch to the London Midland lines through Watford Junction. It would replace the less reliable Rail Air connections by coach. Clearly, some of the existing rail infrastructure is inadequate, but with comparatively modest improvements as noted below (especially in comparison with other major rail and road schemes) many benefits would be unlocked. Capacity improvements are in any event either in train or necessary on existing radial lines that would mean that the incidence of costs would be shared and not wholly attributable to “Airtrack Plus”. The extensive opportunities for interchange with local and main line rail, Underground and Overground, coaches and local buses, would enable very many journeys to be made that are not feasible at the moment, as well as giving opportunities for rail access from other destinations to main centres and traffic generators, many of which are now only accessible by road in the orbital corridor.

Annex: A proposal for an orbital railway

The Core Service for planning purposes would be 4 semi-fast trains per hour over the central section (Woking to Acton Wells/Old Oak Common). Much of the route already exists, but construction is needed at the main junctions and a section by-passing Staines. Additional local services would be provided from the interchanges (many of these local services already exist as part of radial services).

The core route would involve a semi-fast service calling at the following stations:

Guildford: Interchange with Portsmouth, Redhill – Gatwick lines and Blackwater Valley local services. Major town centre, hospital and university town.

Woking: Interchange with SW main lines to Salisbury and Southampton and outer suburban services. Major town centre.

Chertsey: Interchange with Weybridge – Staines services. Major hospital nearby could be served by short bus shuttle.

Heathrow T5: Interchange with proposed Heathrow – Reading service and possible “AirtrackLite”/Crossrail extension to Staines. International Airport.

Heathrow Central: Interchange with Piccadilly Line.

Hayes and Harlington: Interchange with Crossrail and Thames Valley services. Crossrail regeneration potential.

Ealing Broadway: Interchange with Crossrail, Central and District Lines. Major town centre.

Old Oak Common (Acton Wells): Interchange with HS2, Crossrail, Thames Valley and Great Western Main Line, potentially also Overground. Significant future national transport interchange and redevelopment area.

The core service would then split into routes to:

Wembley Central: Interchange with London Overground, Bakerloo Line and potentially London Midland local services (again possibly Crossrail in future). Town centre and international sporting facilities nearby.

Harrow and Wealdstone: Interchange with London Overground, Bakerloo Line and London Midland local services / Crossrail

Watford Junction: Interchange with West Coast Main Line, Metropolitan Line (committed diversion), London Midland and London Overground. Major town centre.

And [via Dudding Hill line]:

Brent Cross (proposed station): Interchange with Thameslink and potentially East Midland services. Major retail centre and redevelopment area.

Potential extensions of services and options:

Basingstoke – Farnborough – Woking

Gatwick – Redhill – Dorking - Guildford

Brent Cross – Mill Hill Broadway – St Albans – Luton Airport – Luton (Major town and airport)

Watford Junction – Hemel Hempstead – Bletchley – Milton Keynes. (Major town and links with E-W rail corridor)

Main Infrastructure Requirements (apart from possible signalling and pointwork where needed to enhance track capacity and subject to detailed engineering studies):

Guildford – potential additional platform already under consideration

Woking – Flyover and additional through tracks and platforms (as discussed)

Chertsey – Heathrow: A new line following the M25 from the existing M25 rail overbridge to the Heathrow T5 station box. The most sustainable solution would be tracks built on the inside lane of the M25, as the capacity of a railway is far higher than a lane of road, although this might seem, under current policies, outlandish! Politically, construction alongside or under the alignment of the M25 is likely. As tunnelling expertise has advanced, this is probably the easiest solution, as we have seen on the Northolt section of the HS2 proposal, and would be plain tunnel, so would not involve any expensive station construction on route.

Acton Wells: New station with interchange to Old Oak Common, and either connection to Euston AC slow lines NW of Willesden or additional tracks to join DC lines at Wembley Central.

Brent Cross: provision for platforms on existing freight lines (which join slow lines at Silkstream Junction)

[redacted]

Friday, January 8, 2016

London's transport infrastructure: Big Picture Stuff

A personal view

By email only to londonevidence@Infrastructure-Commission.gsi.gov.uk

I am pleased to provide this brief submission to the Commission's call for evidence.

As a Director of Ove Arup and Partners I led the team responsible for persuading the Government to abandon British Rail's proposed alignment for the Channel Tunnel Rail Link, and which subsequently designed and constructed what is now HS1. This has in large part been responsible for the success of the Olympics, the regeneration of Stratford and King's Cross and the transformational effect of the Javelin high speed domestic services.

As a Director of Heathrow Hub Ltd and Runway Innovations Ltd, the companies responsible for promoting the extended runway at Heathrow, one of three viable options shortlisted by the Airports Commission and now under consideration by Government, I believe there is a compelling case for a similarly integrated approach to airport expansion and surface access. For me, this is a critical element in the Commission's consideration of strategic options for future investment in large scale transport infrastructure improvements in London.

I understand the political challenges but believe the omission of HS2 and airport capacity from the Commission's consideration is unfortunate to say the least.

For example our privately promoted integrated proposals allow;

- phased delivery of additional airport expansion aligned with demand, air quality and noise targets and surface access capacity,
- lower capital cost allowing all necessary and airport related surface access infrastructure enhancements to be privately funded,
- Crossrail Express services to relieve capacity constrained Great Western Main Line long distance services, increasing commuter capacity in the western corridor and maximising Crossrail's operational efficiency to the west of London,
- New cross-regional through rail services between Basingstoke, Guildford, Woking and Paddington, (via Heathrow), relieving capacity constrained South West Main Line services and congested LUL services from Waterloo and providing passengers from the South West with a direct connection to Crossrail.
- Extending Piccadilly Line services to connect to the Great Western Main Line and Crossrail at Heathrow Hub

This integrated approach is capital effective and revenue positive, providing benefits to both airport and non-airport passengers. It also provides the significant impacts on air quality and carbon emissions that is secured by modal shift from car to rail, not only in the event Heathrow is expanded but also as it continues to grow incrementally as a result of increasingly large aircraft and load factors

In contrast, current plans require significant public monies to deliver sub-optimal results. HS2 intends to fund a replacement depot for Heathrow Express, maintaining this premium service which uses 20% of Great Western Main Line capacity whilst achieving maximum load factor of 30% in the three hour am peak.

The proposed Western Rail Access to Heathrow scheme will, on the Airports Commission's analysis, achieve even lower load factors and will require continual revenue support whilst occupying increasingly scarce and valuable line capacity.

My plea is twofold. Firstly that the Commission brings creative thinking to explore potentially viable strategic options for future private investment in large scale transport improvements in the west of London which would make significant contributions to both the capital and the wider SE region. Secondly that specific attention be given to developing a scenario for sorting out the apparent problems and issues at Euston and Old Oak Common by seriously considering the benefits of the innovative Cross City Connect proposals developed by BuroHappold for a new rail tunnel linking west London with HS1 via a new underground South Bank Central Station between Waterloo and Southwark, with a potential future station in the Barking area before connecting with HS1 north of Ebbsfleet.

Integrated strategic leadership in all these issues is what many of us hope will emerge from the Commission's work! Obviously I would be happy to discuss this further with the Commission.

[redacted]

[contact redacted]

The views expressed by me in this very brief submission are personal and do not necessarily reflect the position of either Heathrow Hub Ltd or Runway Innovations Ltd

Dear Sirs,

As a professional in the transport and planning field, and an occasional user of the London transport infrastructure (mainly as a cyclist - its the fastest mode inside zones 1 and 2, and beyond), I write to offer comment on the call for evidence in respect of the London Transport infrastructure.

I think there are really only two issues in respect of London's transport infrastructure; the level of subsidy it attracts, and the level of provision. Both, in my view, are so disproportionate as to make the provision to all other parts of the UK, and especially the North of England (which for no obvious - or outstanding - reason has been singled out as lacking transport infrastructure), look pitiful. In fact, this is a misnomer. Transport infrastructure provision in the UK is simply being directed in several wrong directions at once. The actual level of infrastructure provision in London is significantly better than the rest of the UK, but its performance - ability to deliver - is almost equally abysmal as in any other major city. The reason is also the same; concentration of resources on the lowest modal utilisation (the car and conventional rail). These two prevent, in the case of the car, efficient use of the highway and goods delivery by the commercial vehicle, and in the case of conventional rail, restrict capacity, and the provision of that capacity, to perhaps 10% of the potential by the use of outmoded and very expensive technology.

In short, London does not have a problem caused by a lack of infrastructure, but a problem caused by lack of effective infrastructure utilisation. That is simply down to poor management, and since government has run UK transport, de facto since 1914, then it is a racing certainty that those - the great and the good of this evidence process - are at least partially culpable in that failure to manage the London land transport infrastructure so that it can deliver what London needs - fast, cheap, low carbon efficient transport for goods and people.

So investment in more of the same is not going to change anything; in fact doing more of the same de facto prevents change. Only doing something different will make a difference.

London needs to lead the world, not follow it. And it can do so easily on the simple level of planning to cope with the cycling revolution now in full flow in the capital; full provision as if the bicycle was the prime user of the highway, with junctions, priority, parking, recharge stations for assisted cycles, all designed to the exclusion - if required - of everything else. Think of it as we did for the motor car 1960 to 1990. Predict and Provide. Stop regarding cyclists as cads on castors (though a few undoubtedly are!) London's shape, as a structural basin, makes the ride to work downhill, on average, with the sweat reserved for the journey home. Makes Paris look hard work, which it is.

The bicycle on its own will do a lot for London, but it will not do everything, though the cost, less than a single rebuild of a mainline terminus, is eminently affordable. It will however, if properly designed, raise zone 1 and 2 transit speeds (door to door) for people from 3-4mph to about 12mph. Outside this central zone cycling will do more than any other modal shift to assist people and goods flows, but it will not address the medium and long distance people and goods flows on which the capital depends, and on which so much is proposed to be spent in addition to what has already been poured down the black holes of Crossrail, HS1, HS2, Crossrail 2 etc.

No current technology will square this circle, but something new will. Second Generation Rail (2GR). You won't have heard of it. It has nothing to do with rail, except the steel of the vehicle tyres and the material of the metal those tyres run on. It offers a solution to the issue of capacity - perhaps 10-fold over conventional rail - at perhaps 10% of the cost, and can be used on the public highway, or on reserved or segregated tracks with full door to door operability. It is equally amenable to freight or passenger, and requires no modal interchanges or special provisions such as large termini;

calculations suggest large termini would be inadvisable due to 2GR's theoretical capacity, even were they desirable. Over medium distances, say up to 120 miles, 2GR would be faster than the TGV and use perhaps 1% of the energy to do the same task. Based upon road vehicle technology, which has driven the western world's mass production for twelve decades, 2GR is only new in the way it looks at the issues of land transport, and the way steel wheels will run on rails; all the rest we already have in the technology drawer.

So London can choose; more of the same at enormous cost, or something new that will deliver what everyone wants at a price that all in the UK, not just London, can afford and acquire.

Yours Sincerely,

[redacted]

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

Unaffordable housing for all except Superrich Need 200+k/y to move to London

Jobs too centralised in Central London

Keeping London the most attractive city to live in the world (critical to maintain advantage as most businesses are based on low taxes and attractive for CEOs and company owners to live and school children

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

- How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?
- What might their potential impact be on employment, productivity and housing supply in London and the southeast?

Transport projects should connect new areas of development to new areas for housing so companies employees can choose a house where transport will be connecting to airports/or central connectors

Crossrail 1 and 2 mostly connect existing houses to existing offices, hence it will take a long time for those living to change their existing commuter routes to new jobs etc.

New centres of development at the edge of London or beyond should be planned to become hbs for certain business sectors options are Stratford/Croydon/Luton/Maidenhead Based on that choice transport should be build to areas for future housing
Trains/underground connected to airport/town centre should supplement this development.

Example: IjBurg development in Amsterdam: Bus (later) tramline was running to centre Amsterdam as soon as the first houses were completed, so everyone could plan their commute using public transport

Aix en Provence TGV station was planned in the middle of nowhere which is now a centre of new businesses between Marseille Airport and TGV Station Aix En Provence.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Build where new business areas and housing will be instead of in existing housing and business districts. The change of jobs will result in public transport being used in both directions and unload existing routes (instead of empty trains going out of London in the morning)

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

-
- What innovative funding mechanisms could be considered to support delivery of key schemes? **See Q5**

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

Voorburg Netherlands constructed a road in a ground level tunnel (Sijtwende Tunnel N14) reducing noise, and making land available on top and next to the road for development largely paying for the tunnel. Imagine putting A3 in London into a tunnel with a train/tube line and selling the land above and right next to the tunnel for offices, cycle lanes, other public buildings etc.

I welcome the opportunity to respond to the National Infrastructure Commission.

[contact redacted]

London's transport infrastructure

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London has been fortunate to have had significant investment in public transport infrastructure over the past decade. However, as a world city growing at a very fast rate, transport infrastructure remains "behind the growth curve". A key part of the commission's work must be to build consensus on transport infrastructure to avoid rejection of bills in Parliament, as the original Crossrail bill suffered in 1994.

The delay caused by the 1994 rejection set back both Crossrail 1 and Crossrail 2. The result is that Crossrail 2 is effectively solving yesterday's problems, not preparing the city for the challenges of the future. However the worst part is that Crossrail 2 is being proposed with no view as to what large-scale schemes will be needed afterwards. This is a critical flaw that must be rectified.

Question 1

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1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

The economy of London has become increasingly centralised, placing rapidly increasing demand on rail-based commuter services. The rise in housing costs in Central London only exacerbates the problem, with increasing numbers of people seeking to travel in from homes in zone 4 and beyond.

Two major schemes will alleviate this in 2018/2019 - Crossrail 1 and Thameslink. However, there is currently a gap of over 10 years to the opening of the next potential major schemes in 2030/2031 - Crossrail 2 and the Bakerloo Line Extension. It is entirely right to fear what 10 years of growth could do to the quality of commutes and safety of services. Ultimately, there must come a point at which bright, motivated people look elsewhere for a better standard of living. The danger is that 10 year gap between major scheme openings may simply be too long.

To put this in perspective, rail growth of 4% year on year results in a doubling of passengers in just 18 years. Since the opening of Crossrail 2 is 15 years away, it can be seen that the existing services in South West London may need to handle growth of 80% or more. It can be argued that this is simply not feasible, even if every seat is removed from trains.

Given the potential harm of relentless growth, the commission should consider whether London needs one or more tactical interventions targeted to open around 2025. One possibility might be express, no-station, tunnels for fast lines, which could be developed quickly as the lack of stations creates fewer planning or construction issues.

Another possibility might be tram systems for areas in zones 1 and 2 such as Hackney to Camberwell, again because tram schemes do not have tunnelling and can be progressed quickly.

It must be noted that the Network Rail long term planning process continues to highlight very high growth in demand on services beyond Greater London. It is already common to see standing for 60

minutes from places such as Winchester. Given the long distance rail infrastructure is at maximum capacity along the SWML (South West Main Line) and GEML (Great Eastern Main Line), there is real risk to economic growth.

(Maximum rail capacity on a two track line should be defined as 24tph (trains per hour) where each train is 12 carriages. While minor variations on this may exist, these maximums have been relatively constant for many years.)

Question 2

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2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

London does not have a vision for large-scale investments beyond 2030.

The impact of this on decision today is explored in the answer to question 3. In this answer, I will outline three potential strategic investments that could be considered.

Extending the Metropolitan and Crossrail 1 in South East London

The Metropolitan line terminates at Aldgate in the City of London.

This is a waste and a classic example of how areas south of the river miss out on metro services.

For the past few years, there has been a proposal to demolish and redevelop the site just south of Aldgate station. In my opinion, TfL should be taking advantage of this unique opportunity to prepare for an extension of the Metropolitan line to Abbey Wood.

The proposal would close the existing Aldgate station, taking the line down and under the District line to a new Aldgate South station on the site mentioned above. A new four platform station would be built, with two Metropolitan line platforms beneath two District line platforms.

The Circle line would cease to run from Tower Hill to Liverpool Street, and the Hammersmith & City line would cease to run from Liverpool Street to Aldgate East. (This greatly simplifies one of the most complex metro junctions in London.)

From the new Aldgate South station, the potential would then exist to extend the line south. My preferred route is to City Hall (London Bridge), Bermondsey, Surrey Quays before surfacing and taking over the existing line through Deptford, Greenwich, Woolwich and Abbey Wood.

Bermondsey would be built as a cross-platform interchange with the Jubilee line, thus passengers from the Greenwich area wanting the West End would have an easy change.

This proposal is intended to be completed in association with a Crossrail 1 extension to Dartford. Rather than needing to build two additional tracks, the Crossrail 1 trains would use the existing tracks to Dartford. Passengers using the current Dartford to Greenwich through service would instead use the high frequency Crossrail 1 service to Abbey Wood and change to the high frequency Metropolitan line service to Greenwich.

It must be emphasised however that this proposal depends on securing and safeguarding the development site south of Aldgate.

Additional Crossrail-style schemes

The primary mechanism to provide the necessary capacity is likely to be Crossrail-style schemes. To meet the growth curve, London needs to be targeting a major opening every 8 to 10 years, something that is considerably more aggressive than achieved to date.

Looking at the areas of London that could be served and could accommodate growth, there is probably a role for at least two more Crossrail schemes. Due to history, there are many more suburban lines south of the river. As such, logic dictates that at least one future Crossrail line will need to run from south of the river to Central London and back to south of the river. The main corridors left to be served would be:

- west towards Putney, Richmond, Roehampton, Hounslow
- south, towards Streatham, Sutton, Crystal Palace, Croydon
- south-east, towards Lewisham, Dartford, Orpington
- east, along the Thames

The most logical grouping would thus be west to south-east and south to east. (Note that areas in the North of London are already well served by the tube, with areas in the north-east served by Crossrails

1 and 2, and areas in the west served by Crossrail 1. The main target for a Crossrail scheme in north London would probably be the Metropolitan line, which might be added to the list of possible corridors.)

Crossrail 1 included some provision for Crossrail 2 in the design of Tottenham Court Road. Without the wider vision for London beyond 2030, it is likely that opportunities will be missed and mistakes made in developing Crossrail 2.

For example, looking at the outline of schemes above, it should be clear that at least one additional Crossrail will run via Clapham Junction (either the west or south corridors). Given this, it is absolutely vital that Crossrail 2 is built with at least passive provision for a four platform station with cross platform interchange at Clapham Junction.

Furthermore, it should be clear that at least one new line will need to run along the Charing Cross - Blackfriars - Cannon Street corridor, and as such this alignment should be safeguarded.

Eastern long-distance express line

At some point soon, the Brighton Main Line will be full. The Great Eastern Main Line will also be full. One possibility is to link them in a true large-scale project.

One possible routing would run from Gatwick to Canary Wharf via Bromley and Lewisham. Such an approach would be a game changer for Bromley, with journey times to Canary Wharf of less than 10 minutes.

From Canary Wharf, the line would continue on in tunnel to Stratford before surfacing and running next to the M11 to Epping. At Epping the line would divide, with one branch running to Chelmsford and the other to north of Harlow. Journey times from Epping and Harlow would also be transformed.

This is of course a very expensive scheme. Despite relatively few stations, it has major tunnelling and surface construction costs. It would likely link into expansion at Gatwick or Stansted airports, or major housing zones (such as at Oxted, Biggin Hill, or North Weald). That said, it would certainly meet the criteria of widening the number of people able to access Central London jobs.

Question 3

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3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

First, lets consider Crossrail 2 in South West London. Currently South West Trains operates three distinct service groups - Long-distance (to Exeter, Southampton, Portsmouth, etc), Outer suburban (to Guildford, Woking, Dorking etc) and Inner suburban (to Shepperton, Kingston, Hampton Court, Chessington and Epsom). Unfortunately, the SWML only has 4 tracks, 2 fast and 2 slow, with the Outer Suburban services shared between the fast and slow. In essence, Crossrail 2 exists to provide an additional 2 tracks making 6 in total, allowing each of the three service groups to operate independently. Unfortunately, there are still two key conflicts which limit the benefits of the scheme.

The Raynes Park conflict

The first conflict is at Raynes Park, where the 20tph Crossrail 2 service interacts with the services to Dorking and Effingham Junction.

This conflict will require Raynes Park station to be completely rebuilt with complex and expensive flyover junctions. The Dorking and Effingham services also have to fight for space on the 2 track section from Epsom to Raynes Park, restricting the frequency of Crossrail 2 service to Epsom and Chessington, and slowing down the Outer Suburban services. The conflict between the two service groups will also hurt reliability.

My proposal to tackle this is the 'Mole Valley Link'. It proposes a new railway line from Leatherhead to Claygate. This route runs through open countryside and would require minimal tunnelling. It also runs near potential housing development sites at Malden Rushett, south of Chessington, where there is potential for a new station.

All services from Dorking would run via the 'Mole Valley Link', stopping at Leatherhead, Claygate and Surbiton, instead of Epsom.

While this is a longer route, the higher speeds and lower conflicts would provide a suitable journey time. The proposal works well because it gets the Dorking services onto the Outer Suburban tracks at Surbiton rather than at Raynes Park. This greatly simplifies the work needed at Raynes Park. (With the 'Mole Valley Link', only Crossrail 2 services meet at the Raynes Park junction.) It is possible that the cost savings at Raynes Park may be sufficient to pay the cost of the 'Mole Valley Link'.

To complete the picture, Crossrail 2 services would run to Leatherhead via Epsom. Services from Effingham Junction would run via Sutton. The 'Mole Valley Link' would also allow Dorking services to be extended to start from Horsham. This would provide a small amount of relief to the line through East Croydon, widening the benefits of Crossrail 2 even further.

The Earlsfield conflict

The second conflict is the need for Outer Suburban services to serve Earlsfield. The station at Earlsfield is in zone 3 and currently served by Inner suburban services. TfL's current plans take Crossrail

2 via Balham. As such, Earlsfield would not be served by Crossrail 2.

Despite being an Inner Suburban location, at least some Outer Suburban services will be required to stop there. This is a clear conflict.

Passengers from Dorking, Walton, Weybridge and Effingham do not want to have their services stop at Earlsfield but will be forced to simply because the operators will have no other choice. The Earlsfield stop constrains the ability to maximise the Outer Suburban service, with 18tph being the maximum likely rather than the theoretical maximum of 24tph. Despite this, Earlsfield is still likely to see a cut of over 33% in services stopping, something TfL appears to want to avoid talking about.

My proposal to tackle this is the 'Swirl-Max' plan. It proposes to take the main line of Crossrail 2 via Earlsfield between Wimbledon and Clapham Junction. 20tph would run via Earlsfield, with the remaining 10tph taking a branch from Clapham Junction to Balham and on to Streatham. From Streatham, the branch would surface and completely take over the existing line through Haydons Road to Wimbledon, where the branch would terminate.

The 'Swirl-Max' proposal vastly increases the areas that benefit from Crossrail 2. Streatham is a fast growing area already, with the existing station seeing growth of 10% year on year, compared to 3% to 4% at most stations on the SWML. In addition, Streatham still offers considerable development potential, far more than many other Crossrail 2 stations along the SWML.

The 'Swirl-Max' route would provide 10tph to the Wandle Valley Opportunity area at Haydons Road station, which currently receives just 2tph. There is also the ability to create a new station at the A24 serving St.Georges hospital and driving developments in Colliers Wood and south Tooting.

Beyond these locations directly served by 'Swirl-Max', there is potential to link to development sites to the south at Mitcham and Hackbridge. Although the 'Swirl-Max' proposal does not propose taking Crossrail 2 to those areas, it does propose that the existing Thameslink service via Haydons Road is diverted to run via Mitcham Eastfields and Hackbridge stations (and on to Sutton, St.Helier and Wimbledon). This would double the service frequency to 4tph through these areas, driving development benefits linked to Crossrail 2.

Finally, it should be noted that 'Swirl-Max' provides a way to serve both Balham and Tooting, rather than one or the other. With four stations near the Northern Line, the relief gained is likely to be better than TfL's own scheme. (TfL's scheme is flawed in that it allows passengers from Raynes Park and beyond the ability to change onto the Northern Line. Since the journey to London Bridge and Bank will be quickest via the Northern Line, the likelihood is that TfL's plan will make the Northern Line worse, not better.)

Thus, while 'Swirl-Max' may be slightly more expensive than the TfL scheme, the benefits that accrue are significantly greater.

Chelsea

Crossrail 2 proposes a station at Chelsea which has proven unpopular with residents. Removing the station would save costs and speed up journey times for South West London. Alternatively, re-routing the line via Battersea Power Station would link to the Vauxhall Nine Elms area that is likely to need additional transport provision over and above the Northern Line extension.

Crossrail 2 in Central London

Crossrail 1 provides four double-ended stations in the heart of zone 1

- Bond Street, Tottenham Court Road, Farringdon and Liverpool Street, plus Canary Wharf. By contrast, Crossrail 2 provides just one double-ended station at Tottenham Court Road.

The provision of a single "destination" station will focus demand on the line. A major concern must be that dwell times there (the time it takes to get everyone on and off the train) will exceed the time available to run a 30tph service. The provision of a second central London station should be a requirement of progressing Crossrail 2.

The best option for such a station is under Jermyn Street, with one end linked to Green Park station. This has the advantage of linking to the Jubilee line, broadening the benefits of Crossrail 2 via interchange. It also further relieves the Victoria line, avoiding the tendency for passengers to clog up the tube with "last mile" journeys to the Green Park area.

Passive provision

As noted in the answer to question 2, the lack of a strategic vision for new lines beyond Crossrail 2 will cause decisions to be taken that may prove to be unwise. Specifically, there is a high likelihood of a future Crossrail line (Crossrail 3 or 4) being routed via Clapham Junction. As such, passive provision for a four platform cross-platform interchange at Clapham Junction is vital.

As it happens, the two branches of the 'Swirl-Max' proposal could be the basis of this Crossrail 3 or 4. One branch would be allocated to Crossrail 2 and the other to the new Crossrail line.

The passive provision point is important. Crossrail 1 has built two tunnels in the east, one to Stratford and one to Canary Wharf.

Unfortunately, this means that both tunnels will be relatively under-used assets, with the services split between the two at a location too close to Central London. However, on more than one occasion I have been told that it will be hard to split Crossrail 1 because there was no passive provision for it. (Apparently, the engineering to build a new sub-surface junction on Crossrail 1 is hard.)

Being more aggressive

Given the demand curve, one option is to be more aggressive with Crossrail 2. It seems clear that there is enough demand for two Crossrail lines to open in 2030, not one, but there is limited scheme management capacity in TfL and bill time in Parliament. One way to catch up the demand curve is to build four tracks through Central London from Victoria to Euston on the Crossrail 2 alignment. This is simple to achieve in engineering terms, as the tunnel boring machine planned to run from Wimbledon to Victoria would simply be extended to Euston. Using the same alignment also avoids extra scheme management time or Parliamentary bill time. To manage immediate costs, trains from

the South West would terminate at Euston, while trains from the North would terminate at Victoria, acting as two independent services.

With this duplicate core section, it would then be easy to extend on from Euston and on from Victoria as a follow on scheme. In the north, enough capacity would be available to send a branch to Stratford and the Lower Thames area. In the south, enough capacity would be available to properly relieve the Northern line and serve areas further south.

The key is the realisation that the most expensive stations on Crossrail 2 are the Central London ones, and as such it may make sense to build them once with four platforms, rather than building them with two platforms and having to return later to expand them. While it sounds expensive, the likelihood is that the additional cost would be of the order of £2bn (£500m for extra tunnelling and £500m extra for each expanded station). This makes the concept a very cheap way to lay the foundations for future extensions.

Costs

There appear to be limited ways to reduce the cost of building Crossrail 2 as currently planned. The station at Wimbledon must be a major target for cost reduction, with 'Swirl-Max' proposing a fast line tunnel to avoid expensive demolition and construction work.

There is one more radical possibility however. If the 'Mole Valley Link' and 'Swirl-Max' were both adopted, then Crossrail 2 could be completely separately from Network Rail (by dropping the Hampton Court branch and Waterloo services to Kingston). Such a separation would allow a change in the technology used for Crossrail 2.

The alternative technology would be the "DLR-style" automated metro that was identified in the 2013 Regional vs Metro consultation. A DLR-style automated metro technology could allow 40tph of shorter trains to provide the same capacity, requiring lower cost shorter platforms. An automated metro is likely to also have lower operating costs.

Question 4

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4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

Funding is not my specialist area. However, I believe that all taxpayers in London should pay a transport investment levy to help fund large-schemes. In addition, development sites near locations that receive transport upgrades should continue to pay a levy.

To broaden the tax base to those that live outside Greater London, two additional areas should be considered. Firstly, those living inside the M25. Secondly those living in districts clearly linked to the London commuting economy. The latter category is subjective, but it would be wise to provide an objective way to classify boroughs near London, such as by the percentage of workers that commute to locations inside the M25.

Question 5

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5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London

Barcelona's new metro line 9 offers a novel construction technique which does not appear to have been examined in London yet. Rather than constructing twin tunnels, each large enough for a single track, Barcelona line 9 uses a single large Tunnel Boring Machine to create a tunnel large enough for 4 tracks (2 on the top deck and 2 on the lower deck). Rather than using the extra space for tracks, the project chooses to use the space to construct the stations within the tunnel, dramatically reducing the cost of building each station. Since stations are the most expensive part of an underground railway, this technique should definitely be evaluated for London.

Summary

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While Crossrail 2 should be supported, it is not without flaws. The 'Mole Valley Link' and 'Swirl-Max' proposals tackle the key issues south of Clapham Junction, while an additional station at Green Park would tackle the flaws inside zone 1. Taken together, these three proposals would greatly increase the benefits linked to Crossrail 2, and the potential for development.

A more aggressive approach would be to build four tracks between Euston and Victoria, with the northern and southern halves of Crossrail 2 overlapping. This has a low additional cost, perhaps around £2bn, but lays the foundation for future extensions that do not have the complication of development in Central London.

Beyond Crossrail 2, extending the Metropolitan line to South East London is worthy of further study, simply because it would be relatively cheap.

Finally, London lacks a wider vision for large projects. This needs to be rectified urgently, as without it decisions on Crossrail 2 may not take into account the wider future context.

[redacted]

Innovate UK

The Innovate UK response to the National Infrastructure Committee's call for evidence on London's Transport Infrastructure.

1. Innovate UK is the UK's innovation agency, a non-departmental public body sponsored by BIS. It is the prime channel through which the Government incentivises innovation in business. Innovate UK is business-led. Our governing board and executive team is comprised of experienced business innovators and experts. We work with people, companies and partner organisations to find and drive the science and technology innovations that will increase productivity and exports and grow the UK economy.
2. We are working to:
 - Accelerate UK economic growth by nurturing small high-growth potential firms in key market sectors, helping them to become high-growth mid-sized companies with strong productivity and export success;
 - Build on innovation excellence throughout the UK, investing locally in areas of strength;
 - Developing Catapults within the national innovation system, to provide access to cutting edge technologies, encourage inward investment and enable technical advances in existing businesses.
 - Working with the research community and across government to turn scientific excellence into economic impact, and deliver results through innovation.
 - Evolve our funding models to explore ways to help public funding go further and work harder, while continuing to deliver impact from innovation.
3. In line with our strategy¹ we operate across Government and advise on policies which relate to technology, innovation and knowledge transfer. We also support Government departments to become more efficient by supporting them in developing innovative solutions through harnessing the creativity that businesses can offer.
4. Innovate UK was established in July 2007 (as the Technology Strategy Board). We have committed more than £1.5 billion to date and independent evaluations have established that overall Innovate UK has created over £6 of GVA for every £1 it has invested and 7 jobs for every business it has invested in. Over the last 8 years this has added up to delivering a total of £7.5Bn and 35,000 jobs. The private sector more than matches that investment, doubling the power of public sector money, and we have directly supported over 6,500 companies. We work with nearly every University in the UK to stimulate the commercialisation of leading-edge academic research and innovation.
5. Transport Systems as well as vehicle technology across Automotive, Aerospace, Marine and Rail have had a major focus within Innovate UK over the last eight years. We have placed significant investment in collaborative R&D partnerships, driving growth within businesses and supply

¹ 'Concept to Commercialisation: A strategy for business innovation, 2011-2015'.
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/360620/Concept_to_Commercialisation_-_A_Strategy_for_Business_Innovation_2011-2015.pdf

chains, both nationally and for exports. These areas continue to be prime focal points as we build on success in these sectors of national importance by delivering the Advanced Propulsion Centre and Aerospace Technology Institute programmes on behalf of the Department of Business, Innovation and Skills.

6. The Transport sector has grown into one of Innovate UK's key priorities. Our aim is to help innovative UK businesses to take advantage of the opportunities that a rapidly changing transport system will present, both in the UK and in overseas markets. Over the last parliament we have invested up to £70m per year of our core budget in support of hundreds of innovative businesses developing new products across the transport sector, from new powertrain technologies for low emissions buses, through to low noise aircraft systems and intelligent mobility services. Our focus from 2007-2015 grew from the Low Carbon Vehicle Innovation Platform to cover Aerospace, Rail, Marine and Transport Systems.
7. Innovate UK supports businesses in two main ways. Firstly, we provide funding to allow development of high potential, ground-breaking new technologies and products that are too early and too risky for the private sector to fund alone. Secondly we help businesses connect to the right partners, expertise, test facilities, financiers and influencers that can accelerate their route to market. A key component of innovation is knowledge exchange through networks. To drive this at a national level Innovate UK has invested £1.5bn in establishing world leading Catapult centres, which are designed to transform capability for innovation in specific areas of specialism to enable future economic growth. These centres launched by Innovate UK, provide critical expertise and test facilities to businesses in developing new products. Within near reach of London with a focus on transport challenges we have Transport Systems and Satellite Applications, and inside the capital we have the Future Cities and Digital Catapults. Additionally, the national network of High Value Manufacturing Catapults are extremely important for grounding the manufacturing of new transport technologies in the UK.
8. The demand for transport and its infrastructure is proving to be a critical challenge for the UK in enabling businesses to function and to support economic growth through the movement of people and goods. Notwithstanding social development, wellbeing and environmental impacts, we see great potential in balancing demand and optimising connectivity through evaluation of new innovations and technologies and how these trends can offer greater utilisation of the national transport infrastructure. Equally advancements in new innovation for asset management and connectivity can provide cost savings in operational maintenance for local authorities.
9. We have shown how major demonstrations of new innovations and technologies, such as electric vehicles, can attract international investment into the UK and accelerate market adoption of low emission technologies and reduced risk for industry to bring new products to market. New business models provide value across the range of transport issues and we have also seen valuable insights into the complexities of the network users and how disruptive and innovative thinking can drive a change in behaviour towards transport.
10. Expertise and sector knowledge at Innovate UK can bring significant change in the transport market. Through working closely with industry and evaluating past projects Innovate UK provide timely and value added interventions to drive supply chain growth and productivity. We demonstrate how the collaboration across industries can open new value to capture and meet the future challenges of transport.

11. The value of working closely with UK Governments on specific societal challenges can bring about timely change in regulation and standards to match the pace of technology and innovation and how these drive new customer demands. Projects funded through Innovate UK show how risk reduction through targeted innovation investment can overcome perceived challenges and drive collaboration across industries on a common challenge. Innovate UK welcomes the National Infrastructure Committee's inquiry into London's Transport Infrastructure. Set out below is our response to the questions raised by the Committee.

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

12. London's ability to move people and goods over the next two to three decades to support economic growth and social wellbeing will be challenged by the limited transport network capacity through its geographic constraints and how it has evolved in construction terms as a city over the years. Increasing population through migration, aging and urban growth, places significant challenges onto London and its existing transport infrastructure.

13. Drivers spent more than 250 hours idling in London traffic in 2013, which is double the UK average – and this is set to increase to 299 hours in 2030, equivalent to 40 working days a year. Although less than a third of Londoners commute to work by car, the cost of living and the value of time for the capital's 1.4 million car commuters is at such a premium that in 2030, it is estimated London will incur £9.3 billion from traffic congestion, an increase of 71 percent from today, costing each car commuting household more than £4,000 a year by 2030.

14. The commuter today is already witness to train overcrowding and congested roads and the frustrations and stresses in the daily commute. Today's rail commuters already consistently exceed available capacity in and out of London during the morning and evening peaks (demand is 104% of capacity) and these trends look set to continue. Demand exceeds capacity at mainline stations including Paddington at 110%, Moorgate 108%, Blackfriars 108% and St Pancras 107%.

15. Improving public transport reliability, predictability and accessibility will be challenging for the transport system of the future due to increasing demand from a diverse demographic as well as vehicle and connecting infrastructure security. Other social challenges include safety for pedestrians and cyclists. Additionally the commuter, traveller and tourist face air quality concerns.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

16. There are a number of options which include:

- enhancements in signalling (through ERTMS or ETCS) on the existing mainline network, which has the potential to significantly increase capacity by enabling closer running of rail services;
- further roll out of future rail technologies - such as autonomous tube rolling stock (as in use on the DLR);
- electrification of non-electrified London stations will contribute to an accelerated rail timetable and in addition to investing in large-scale transport infrastructure, a range of incremental gains may also be realised by strategic delivery of a range of lower-cost options to enable faster passenger loading, dwell times at stations, optimised train driving aids and smart technology to support passengers in making informed travel choices;

- the strategic consideration towards the reduced use of the private car in central areas and incentives towards zero emission vehicles. Better use of park-and-ride out on the peripherals of the city such as the M25, with driven or driverless/autonomous vehicles serving individual's needs in accessing the city;
 - to benchmark international initiatives such as Frankfurt, Amsterdam, and other large EU cities that have tackled these issues, e.g. wide use of street-level trams, simple ticketing, transparent and cost effective pricing, radial as well as axial routes to encourage businesses to site themselves out of the city centre;
 - a strategic and tactical view to consider new business models in how operation of local transport such as taxis and buses can enable a more on demand service rather than traditional methods of delivering a public transport services;
 - a push for greater optimisation of the River Thames as a means of moving people and goods efficiently, providing greater physical connectivity with additional bridging. Providing better commuter and traveller information through enhanced and accurate information through wireless connectivity;
 - infrastructure investment should also consider the optimisation of transport within London as a system. Using innovations in infrastructure intelligence to drive greater intermodal connectivity and ways of balancing the transportation network;
 - to build upon the demonstrated benefits of smart infrastructure by the Cambridge Centre for Smart Infrastructure² to realise those benefits across the whole lifecycle of future infrastructure projects, from design and construction through to operation; and,
 - to support shifts in propulsion systems, alternatively fuelled vehicles need infrastructure including rapid electric charging points and hydrogen refuelling.
- **How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?**
17. Priority should take into account the ability to smooth transportation flows and optimise capacity. Connectivity to jobs and businesses drives economic growth, reducing journey times and congestion enables greater mobility of both people and goods. This could be achieved through an in-depth study, ideally with the support of specialist agencies including the DfT, TfL, modelling tools. This could be done through the Transport Systems and Future Cities Catapult and other specialist agencies as appropriate.
- **What might their potential impact be on employment, productivity and housing supply in London and the southeast?**
18. We would recommend a study ideally with the support of specialist agencies including the DfT and Transport for London to assess trends in innovation and technology and matching that with population, migration and business growth forecasts. This would assess the impact of large-scale transport infrastructure improvements in London on employment, productivity and the supply of housing.

² The Cambridge Centre for Smart Infrastructure is an Innovation and Knowledge Centre, jointly funded by Innovate UK and EPSRC to bring research into smart infrastructure into practice through a series of technology demonstrations with industrial partners. Led by Professor Lord Mair, CSIC has been involved in both Crossrail and the London Bridge upgrade project to demonstrate the benefits of smart infrastructure and are in discussions with all the major infrastructure projects to continue this work. See <http://www-smartinfrasturcture.eng.cam.ac.uk/who-we-are>

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

19. There are opportunities for Crossrail 2 to be explored through modern digital engineering practices, such as smart infrastructure and maintenance. Condition monitoring systems and intelligent sensors would help to reduce operational costs. The digital revolution is enabling greater mobility of people through smart ticketing, ticketless barriers and greater system connectivity. Learning from industrialised sectors such as Aerospace and Automotive in the design and development of long term programmes and process innovations should be explored by the construction sector and therefore encouraged by the public sector procurement. Specification freeze, engineering change control and complete design for manufacture ownership are lessons that can be learnt.
20. It is expected that the proposed Crossrail 2 project will be fully BIM level 2 migrating to level 3 compliant (a project heavily supported by Innovate UK), and will be able to benefit from the legacy of Crossrail 1 and other mega infrastructure programmes such as Thames Tideway and HS2 phase 1.
21. Further benefits could be realised through the use of novel building methods such as offsite manufacture in the construction phase. Equally instilling a culture for innovation within the programme and driving innovative practices into the development frameworks from the funder should challenge traditional design and engineering practices, standards and regulations and drive new methods for assessing risk through a balanced portfolio. To drive innovation into the supply chains through accelerated procurement specification and requirement capture to deliver a more cost effective railway, rolling stock, system and construction.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

22. This is for others more expert in the delivery of large-scale transport infrastructure to comment.
 - **What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?**
23. This is for others to comment.
 - **What innovative funding mechanisms could be considered to support delivery of key schemes?**
24. A funding scheme that considers and drives cross sector innovation. To include transport modes, digital, construction, local regions and attracts emerging non transport industries to provide innovative systematic products and services in the design and operation of the transport system.

These could include Innovate UK's SBRI³ and CR&D⁴ mechanisms and the national Catapult centres⁵, supported by a London Innovation Fund.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

25. The challenges facing London are very similar to other cities globally, as population growth and the demand for transport, travel and social wellbeing drives expectations of the transport network. In many cases demand is outstripping supply. These lessons are being learnt by London. Global benchmarking and collaborations would provide accelerated learning and reduced trial costs.

Evidence submitted on behalf of the Innovate UK by:

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Chief Executive, Innovate UK

Signed:

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Date: 12.01.16

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³ The Small Business Research Initiative (SBRI) is a programme that addresses public sector needs with solutions from businesses via pre-commercial procurement contracts. More information: <https://sbri.innovateuk.org/>

⁴ Collaborative research and development (R&D) co-funding projects involving partnerships between businesses and between business and academia, it reduces financial and technical risk and encourages knowledge exchange, supply chain development and parallel working on complex challenges. See <https://interact.innovateuk.org/-/collaborative-r-d>

⁵ The Catapult centres are a network of world-leading centres designed to transform the UK's capability for innovation in specific areas and help drive future economic growth. See <https://www.catapult.org.uk/>



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Submitted electronically

8 January 2016

ICE written submission to the National Infrastructure Commission call for evidence – London’s Transport Infrastructure

Dear Lord Adonis,

Please find the Institution of Civil Engineers’ submission to the National Infrastructure Commission call for evidence on connecting northern cities. This submission is an output from ICE London region.

The ICE is a UK-based international organisation with over 86,000 members ranging from professional civil engineers to students. It is an educational and qualifying body and has charitable status under UK law. Founded in 1818, the ICE has become recognised worldwide for its excellence as a centre of learning, as a qualifying body and as a public voice for the profession.

In London, ICE supports and represents over 9,000 members living and working in the capital to actively promote civil engineering with industry, schools, universities, local government and the media. Further details from www.ice.org.uk/london

We welcome the opportunity to respond to the National Infrastructure Commission on the pressing issue of London’s transport requirements over the next 20 to 30 years. We have kept our response brief and focused on key points. Our members have much to offer in terms of expertise and would welcome the opportunity to further assist the Commission in its work.

Yours sincerely,

Suzanne Moroney
Director, ICE London and South East England

National Infrastructure Commission Call for Evidence - London's Transport Infrastructure: ICE London Response

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

The major challenges facing London and the wider South East are undoubtedly the anticipated population growth, the related problems of capacity constraints across all types of infrastructure and a long term problem of building too few homes to accommodate the growth in households.

The [London Infrastructure Plan 2050](#) (LIP 2050) sets out a projected population growth of over 40% by 2050, bringing London's population to over 11 million.

Much of London's infrastructure is already at or close to capacity. Commuter lines into London and the tube network frequently experience overcrowding. Significant parts of the Capital's main highway network are already stretched to and beyond their practical capacity with the result that whole areas can frequently become gridlocked. London and the South East are likely to need a new water resource within the next 25 years. Increased pressures on electricity mean that we need to an improved approach to demand management.

Housing regularly tops Londoners lists of concerns, based on exceptionally high selling and rental prices, as well as over-occupation. An estimated 49,000 homes¹ are required per year to 2050, significantly more than has been built in London in previous years.

A lack of affordable housing and increasing pressures on infrastructure have obvious impacts on Londoner's quality of life. Whilst London still remains an attractive place for young professionals, high house prices could soon see young skilled workers moving out of the city to areas where they can buy or afford to rent a property. If this happens on a large scale, the likely impact is a significant increase in the numbers commuting into London, putting ever greater pressure on the rail network. Others may be put off commuting into London by journey times and/or high fares. Transport operational staff, in particular need to live close to their workplaces.

ICE London believes London's future economic growth will be constrained unless there is sustained investment in the city's infrastructure and housing.

¹ [London Infrastructure Plan 2050](#), page 14.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

There are parts of London with significant space for house building that are currently not being built on. In many cases the reason is simple; these areas do not have effective transport connections. Barking Riverside is a prime example, where brownfield land has the potential for over 10,000 new homes to be built. In the absence of the proposed extension of the London Overground to Barking Riverside, no more than 1,500 new homes are permitted. Such development will bring jobs and economic growth to the area. ***The provision of additional housing and related employment should be planned in tandem with upgraded and new transport provision, and this must be placed at the top of any prioritisation assessment.***

A strategic long term approach is required that maps out London's key transport requirements. A project by project approach will not provide London with the best outcome; it is the combined impact of transport, housing and infrastructure investments that will realise the highest benefits for London.

A decision on airport capacity is urgently needed if London's transport needs, and house building, are to be planned effectively.

The LIP 2050 sets out a strong plan for London's transport investment to 2050, albeit with the need for further prioritisation and an update when the Government makes its decision on airport capacity. The need for future reviews and updates, should not delay implementation of the projects identified as necessary in the nearer term.

Better transport links to the wider South East must also be a high priority. The proposed Crossrail extension to Ebbsfleet and giving Transport for London control of more South East rail routes are crucial in providing better connectivity into London.

Transport for London has identified a wide range of interventions which have positive business cases. We do not propose to rank individual projects here but see a pressing need for two projects in particular, namely Crossrail 2 and the Silvertown Tunnel.

Given its forecast beneficial impacts on transport relief and economic development, Crossrail 2 must be a priority and ICE London is pleased to see a growing consensus from local, regional and national government on the need for the scheme. Many of the benefits of Crossrail have already been seen in terms of unlocking housing growth and ICE London believes that similar gains will be accrued from Crossrail 2.

Similarly, the Silvertown Tunnel is a much needed scheme to alleviate congestion on the Blackwall Tunnel. East London urgently needs a series of river crossings; Silvertown Tunnel should be considered as the first of a number of new multi-modal river crossings to the



east of Tower Bridge. This will open up opportunities for housing and employment growth at the London Riverside, Royal Docks and other Opportunity Areas on both sides of the river. Such schemes have long been regarded by existing employers and potential inward investors as being absolutely top priority.

There are several other schemes with strong business cases, that ICE London believe to be necessary to support London's growth. These include the Barking Riverside Overground extension; DLR extensions; the Croydon Tramlink extension; London Underground major station capacity enhancement schemes.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

The Government has the ability to significantly reduce the costs of infrastructure build in London by clearly committing to a long term programme of work. This programme should not be changed at political whim, but revisited periodically and adjusted to reflect changes in the way the city functions or technological advances.

A clear programme of work, that sets out the timeline for major project delivery and commits to funding, will allow the construction industry to reduce costs:

- A long term plan will enable effective sequencing of projects, to either remove clashes for particular skilled workers or allow synergies to evolve e.g. where joint training academies are established.
- Certainty will enable greater investment, which will require a lower rate of return due to the lower risks of the project being stalled or abandoned.
- Planning for their workforce now – this will ensure there are adequate numbers of skilled workers, and avoid the need to pay excessive wages to those with skills in short supply. It will also reduce delays.
- Planning their supply chain now – this will reduce delays and the cost of sourcing materials and component parts. This will have the added benefit of allowing firms around the UK to gear up to supplying projects such as Crossrail 2, avoiding the need to source materials from abroad.

The London Infrastructure Plan 2050 and the Mayor’s Transport Strategy need to be articulated into a programme of work that sets out and sequences the key infrastructure projects and development sites over the next 20 years.

ICE London believes this is the single most effective way to reduce costs. A decision is urgently needed on airport capacity to enable a realistic programme of work to set out.

On Crossrail 2, there are likely to be further efficiency savings that are possible. For example, by exploiting the potential benefits of BIM and adopting best practice contracting and procurement. On major projects additional money is often spent at interfaces with other infrastructure owners and utility companies. This is where the risks are. Early engagement and buy in from all parties is crucial to successful, lower risk and lower cost, delivery.

Further innovations may come forward that reduce costs. This is tax payers and fare payer’s money being spent, so every effort needs to be made to make sure it is being spent wisely.

Crossrail has developed much in the way of best practice particularly on skills development and innovation, these need to be captured and built on for Crossrail 2 and other major projects. There will be other areas, that with the benefit of hindsight, can be improved on.

ICE London recommends that infrastructure providers, innovators and academics are brought together and set the challenge to reduce the build cost of Crossrail 2. This should



include a session on lessons learned from Crossrail. ICE London would be happy to convene such a group and report to the Commission on options to reduce costs. Many of the innovations that come forward would likely be applicable to wider infrastructure build.

The benefits of Crossrail 2 will be maximised when it is planned alongside London's wider infrastructure needs. This will ensure the possibilities for integration are taken full advantage of.

For example, designing in energy cooling from the ground around the tunnels to either help cool the tunnels themselves or supply heating and cooling to local building networks around shafts and stations. This was considered too late for implementation on Crossrail, but has been proven to be effective in other European countries.

One of the main benefits of Crossrail 2 is the potential to unlock significant housing growth along its route. ***The potential for the creation of new vibrant communities will be maximised if there is a clear and early commitment to fund and deliver Crossrail 2 to stated timescales.*** Experience from London's Docklands demonstrated that an early physical and hence visible start at least to preparatory works generates early simultaneous inward investment. This will give developers the confidence to start building homes and invest in the public realm aspects of the development that will ensure high quality places to live are created.

As well as branches via the Lee Valley and to New Southgate a further extension serving major potential housing development and Opportunity Areas in east London which would potentially offer additional development related funding towards Crossrail 2 should be considered. A spur has been safeguarded to facilitate a possible extension to east London and the ICE suggests that this is considered by TfL, as well as how Crossrail 2 can improve access to Stansted. An extension from Epsom to Gatwick should also be considered.

Jobs are the other main benefit for London overall and areas along the route, again a clear commitment to Crossrail 2, will allow training schemes to be put in place to ensure local people benefit from the job opportunities created.

The benefits of Crossrail 2 will spread far wider than London, and this must be factored into any consideration of the benefits.

The rail line will serve regional areas outside Greater London and will connect to National Rail networks in Hertfordshire and Surrey, better linking those to the London Underground and national and international services. Crossrail 2, like Crossrail, is forecast to generate jobs around the UK – 60,000 while it is being built and 200,000 once the project is operational².

Crossrail 2 will maximise the effect of other transport investments, particularly those such as High Speed 2, that better connect other parts of the country to the capital; by relieving congestion at key points where National Rail lines meet the London Underground. It would

² TfL analysis



be less than optimal to improve journey times into London, only for passengers to be held up accessing an overcrowded tube network. High Speed 2 arriving into Euston station is the obvious example.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

Crossrail 2, along with many of London's other transport requirements have a positive business case and will generate significant additional value for London and the UK as a whole. In the long run, investment will pay for itself through higher productivity, greater revenues to business, increased land and property values, and increased tax receipts for government. The issue is how these gains are captured and used to fund infrastructure investment.

ICE London supports the GLA's pursuit of fiscal devolution. Devolution of the form set out by the [London Finance Commission](#), whereby London retains income from property tax to make self-determined investments in its infrastructure, would provide a source of revenue in itself and provide greater scope to borrow to fund infrastructure. A funding gap will still remain, and alternative funding mechanisms will be required.

Transport investment in particular can have a significant impact on property prices. Crossrail is demonstrating this well, even before it has opened – Whitechapel residents are expected to see a 54% increase in property values, with the average increase along the line expected to be 9%³. As a minimum, the increase in stamp duty and business rates revenue this produces should be available to London, which the city can then borrow against to fund transport projects.

Learning from the Northern Line Extension and similar schemes, there are opportunities to take advantage of local uplifts in land values ***ICE London would like to see mechanisms put in place to allow the capture of increased property and land values for example through the opportunity and compulsory purchase of land parcels along key new transport routes and through additional property taxes in areas that have seen significant increases in property values due to transport investment.***

Crossrail was funded by equal contributions from Central Government, London Government and London business. London businesses were in support of this arrangement and are signalling similar levels of support for a comparable arrangement for Crossrail 2.

It is reasonable to argue that those who benefit should pay, its seem logical that the cost should be shared between National Government (who will gain from increased tax revenues), property developers (who will gain from higher returns), residents (who will see a rise in the value of their property), passengers (who will gain from improved connectivity, reduced journey times and so greater access to jobs and leisure opportunities) and London businesses (who will gain from improved connectivity for customers and employees).

³ [JLL analysis](#)

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

On financing, the Mayor of Chicago Rahm Emmanuel set up a Chicago Infrastructure Trust as a new method of generating private investment for infrastructure projects.

The Trust has funded an energy retrofit programme for 60 public buildings, costing \$12million and recently negotiated a \$32million 4G upgrade of the Chicago transit system. It has also been suggested that the Trust could fund a high speed rail link to O'Hare Airport.

The Trust does not work as a Private Finance Initiative (PFI). Instead, the Mayor would release bonds for the private sector to invest in, whilst ownership and management of the infrastructure would remain with the public sector.

In London, an Infrastructure Trust could be set up in the same way as the London Enterprise Panel, under sections 30 and 34 of the Greater London Authority Act 1999. Should a Trust be set up, it could provide a significant level of funding for projects like Crossrail 2.



Rt. Hon Joan Ryan MP
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Please find below my submission to the National Infrastructure Commission's call for evidence for the CrossRail 2 consultation.

I am responding in my capacity as MP for Enfield North, an area which could benefit substantially from significant infrastructure investment.

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

The greatest challenge for London and its commuter hinterland over the coming years will be how we can continue to connect people's homes with jobs. Cities are engines of growth, and London is particularly important in driving the UK economy. London's ability to do so relies upon being able to house and then transport a talented labour force to work. But with the population continuing to grow rapidly – by the equivalent two tube trains full of people every week – this is becoming an increasing challenge.

The housing crisis in London, including here in Enfield, has been well publicised. What is clear is that over the coming decades we will need to build significant numbers of new homes. These homes are essential if London is to continue attracting talented people that work in the high-growth sectors that power the economy. But to be viable, these homes must be built around public transport networks. In my constituency, road congestion is already severe in the morning and evening rush hours, partly because existing rail services are not as frequent or reliable as required. While there is potential for new housing development in my constituency, to take this forward without a big improvement in public transport would overwhelm the road network. If we fail to build more homes it will only make the existing challenges worse and damage London's long-term prospects.

Many of my constituents travel into central London to work: severe congestion on the transport network is a daily challenge for many, delaying journeys into work and deterring people from travelling to highly productive and well paid jobs in the centre of London. While planned improvements are welcome, over the next few decades London will need to invest in major new infrastructure projects to provide a major capacity boost. Without the transport network that can connect homes to jobs, London's international position is at risk.

This would harm my constituents. The London-Stansted-Cambridge corridor has had enormous success in attracting high-tech firms which provide skilled jobs. Proximity to a thriving London has been crucial to attracting that inward investment which is needed to drive up living standards in my constituency. In Enfield wages are significantly below the London average and unemployment is persistently higher. London must continue to thrive to create new opportunities for people there and across the whole city.



2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

My constituency needs public transport improvements in the short, medium and long term to support economic growth. In the short to medium term, Network Rail needs to commit to improving the West Anglia Main Line to provide more frequent and more reliable services.

Currently, services on the West Anglia Main Line (WAML) are severely hampered all the way along the line because the section between Coppermill Junction (just south of Tottenham Hale) and Broxbourne Junction in Hertfordshire – which passes through the Eastern side of Enfield North - consists of only two tracks. Fast and slow services compete for space and as a result, journey times are long for the longer-distance services and frequencies are relatively low for the shorter-distance stopping services. Reliability is also a key concern: if one track is out of action services can become delayed or cancelled.

Providing four tracks could provide the solution, and would also pave the way for Crossrail 2, which would allow up to 30 trains per hour in each direction through central London and connect into the region's existing transport network. Delivered by 2030, Crossrail 2 could unlock tens of thousands of new homes and jobs in the WAML corridor alone. The delivery of four-tracking by 2024 will ensure that this growth can be kick-started ahead of Crossrail 2 opening in 2030. This would provide a step change in accessibility in my area and unlock growth in the Upper Lea Valley, one of London's largest opportunity areas.

It is important that strategic options for future investment in large-scale transport infrastructure improvements focus on maximising the return on investment. This is best achieved by targeting areas with high growth potential, such as the opportunity areas in the Upper Lea Valley. These areas have the most opportunity to unlock economic growth which can pay back the original investment, securing a stable economy. While it is important to invest in cities around the UK, this cannot be at the expense of London. It not only needs investment, but can also provide the greatest return on that investment, growing the national economy. Growth is not a zero-sum game.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Delivering improvements to the West Anglia Main Line in Network Rail's control period 6 (2019-24), with an explicit commitment to Crossrail 2, would unlock significant housing and economic growth years ahead of the railway opening. As we have already seen with Crossrail, significant housing development happens in anticipation of the new railway, and the Upper Lea Valley provides very large opportunities to build some of the tens of thousands of new homes that we need. A commitment to improving the line and progressing Crossrail 2 would help increase the benefits, and deliver them earlier than would otherwise be possible.



Benefits could further be maximised if holistic development plans are drawn up along with transport plans. Enfield Council has developed ambitious plans for new homes, jobs and growth at Meridian Water as a result of local rail improvements. With further commitments to Crossrail 2, these plans could be further developed at other locations in the borough, to maximise opportunities and get the most efficient use of the infrastructure.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

Crossrail 2 has developed a funding package where the majority of funding is locally provided. This type of funding model, where Government's contribution is dramatically reduced maximises value and instead focuses planners on how best to design projects that can pay for themselves through greater economic growth, job creation, reduced unemployment and increased tax receipts.

Government needs to demonstrate leadership and commitment to Crossrail 2 by providing the development funding needed to get projects off the ground. That businesses are paying for Crossrail shows that, providing there is a clear Government commitment to infrastructure investment, new funding streams can be secured. This minimises central government expenditure while maintaining the transformational benefits of the infrastructure. With a possible funding structure in place, central Government should provide the £250m needed to develop Crossrail 2 and secure powers to build it in this parliament.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

In Hong Kong, city planners work as part of the railway company to devise development plans which provide a funding stream for the railway. These integrated plans make the most of available opportunities and help pay back the investment faster. Parts of the Upper Lea Valley contain large areas which could be regenerated and support new development should Crossrail 2 go ahead. Mechanisms which capture this value could be developed to provide additional funding streams for the project.

Thank you for the opportunity to respond to the call for evidence.

Regards,

A handwritten signature in blue ink, appearing to read 'Joan Ryan'.

Rt. Hon Joan Ryan MP

Kent County Council response to National Infrastructure Commission re London's Transport Infrastructure



January 2016

Introduction

The right infrastructure is key to growth; however getting the right infrastructure at the right time and getting funding for it is a challenge for many of the priority growth areas of the country.

National government clearly has a major role to play and it is in this context that Kent County Council (KCC) welcomes the National Infrastructure Commission (NIC) as a permanent statutory body. The County Council supports the NIC's preparation of a National Infrastructure Assessment (NIA) which will provide long term strategic vision and establish clear, spatial priorities for the delivery of infrastructure aligned to economic and population growth. The NIA will ensure greater certainty for private investors, and provide greater assurance to local authorities and the development industry that growth is deliverable in a sustainable manner, supported by existing and planned infrastructure.

In November 2015 KCC published the 'Kent and Medway Growth and Infrastructure Framework' (GIF)¹ which comprehensively identifies the significant levels of economic and housing growth planned in Kent and Medway (to 2031) alongside the critical infrastructure necessary to facilitate this level of growth. Infrastructure necessary to unlock growth has been estimated at £6bn of which £2bn is currently unfunded, which if left unaddressed will undermine the long term delivery of sustainable growth in Kent and Medway. The County Council and its partners are now actively preparing a 10 point action plan to take forward the GIF including consideration of the funding models and structures required to deliver identified infrastructure priorities.

KCC therefore welcomes the opportunity to respond to the NIC in respect of London's transport infrastructure. The provision of good, efficient and reliable transport infrastructure in the capital is essential to ensure the free movement of people, goods and services between London and its environs, including Kent. Our county also acts uniquely as the primary transport corridor between the capital and the principal Channel ports of Dover and Eurotunnel.

London's transport infrastructure is not all about infrastructure in London. It is – or should be – about the provision of transport infrastructure which serves the whole of the greater south-east region, supporting the wider growth of the Home Counties which provide a significant proportion of the capital's workforce who are dependent on excellent transport infrastructure to access their employment and so contribute to the gross domestic product of the whole area.

There are a number of key transport initiatives which will have a direct bearing on London's transport infrastructure and its ability to cater for an ever increasing demand from commuter, business and leisure markets. Each of these initiatives is considered in relation to the specific questions posed in the consultation.

¹ The GIF is available to download via www.kent.gov.uk/GIF

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

The major economic and social challenges facing London and the greater south-east region over the next two or three decades can only be properly understood in the context of that wider region. The challenges facing London cannot be addressed in London alone; they must embrace the region in which the capital is located and from which it draws its daily workforce. The challenges facing London and its Home Counties must therefore be treated together.

KCC has identified significant increases in employment growth and housing need projections in Kent and Medway between now and 2031. This growth should be recognised as a part of the major economic and social challenges facing the wider south-east region, and the NIC's plans for London's transport infrastructure must be cognisant of these significant economic and social challenges.

Projected Growth in Housing Need to 2031

The following figures for each District in Kent, and for Medway, indicate the forecast level of housing need between 2011 and 2031 (correct at November 2015):

District	Additional housing need 2011-31
Ashford	14,540
Canterbury	16,000
Dartford	17,300
Dover	14,000
Gravesham	6,170
Maidstone	18,560
Medway	24,000
Sevenoaks	12,400
Shepway	8,750
Swale	13,192
Thanet	12,000
Tonbridge and Malling	13,460
Tunbridge Wells	12,960

Projected Growth in Employment to 2031

The following figures for each District in Kent, and for Medway, indicate the forecast level of employment growth between 2011 and 2031 (correct at November 2015):

District	Additional employment growth 2011-31
Ashford	17,200
Canterbury	17,000
Dartford	22,100
Dover	400
Gravesham	7,000
Maidstone	14,400
Medway	20,100
Sevenoaks	7,000
Shepway	500
Swale	9,900
Thanet	5,000
Tonbridge and Malling	7,700
Tunbridge Wells	9,900

Southeastern Metro Rail Services

KCC has taken a very keen interest in recent years in the commuter routes which serve the south-east London suburbs and the western fringes of Kent. An approach from Transport for London (TfL) in 2013 to seek approval from KCC to their proposal for the transfer of the franchising authority for the Southeastern Metro rail services from the Department for Transport (DfT) to TfL was opposed by KCC at this time. The proposal did however present KCC with the opportunity to commission detailed consultancy work on the likely impact of the transfer of these Metro services, on both London and Kent.

The report (attached) provided some very useful data concerning current and projected usage of the south-east London Metro network and highlighted particular concerns, specifically around ticketing and performance issues on certain routes through south-east London to the capital's termini. For the purposes of this response, the WSP report contains much useful data, and the NIC may find some of its material helpful in determining the need for particular infrastructure improvements in the south-east London Metro operating area.

Subsequently, KCC has responded favourably to a new proposal from the Greater London Authority (GLA) for the transfer of south-east London Metro services to TfL. Following an agreement between KCC and TfL which protects the interests of Kent's rail passengers through the inclusion of three 'red lines' in respect of fares, paths and capacity, KCC has now agreed in principle to the future transfer of these services at, or shortly after, the start of the new franchise for the Southeastern operating area in 2018.

2. What are the strategic options for future investment in large-scale transport

infrastructure improvements in London - on road, rail and underground - including, but not limited to, Crossrail 2?

Lower Thames Crossing

For many years KCC has promoted the need for a new Lower Thames Crossing that will cater for strategic traffic and the county's function as the gateway to continental Europe, as well as providing greater connectivity with Kent's immediate neighbours to boost local and national economic activity and productivity. The existing Dartford-Thurrock River Crossing (A282 trunk road) is a significant link in the strategic road network, facilitating the movement of goods and people from Kent across the Thames to Essex and the North. The crossing is used by over 50 million vehicles each year, which is well above its design capacity. This lack of capacity results in congestion and unreliable journey times. Recent attempts to improve the crossing by removing the toll-booths and encouraging free-flow traffic have seen positive results but nevertheless traffic volumes continue to grow at the crossing and congestion will soon return to the levels seen before the improvements.

With the Garden City development at Ebbsfleet comprising a predicted 15,000 new homes, and the proposed Paramount development on the peninsular forecasting 27,000 new jobs, the need for the Crossing is ever more pressing. The delivery of a third crossing is vital to support the future growth of London, the South East and the UK as a whole.

KCC supports the provision of a new Lower Thames Crossing to the east of Gravesend and Thurrock connecting the M2 with the A13 and the M25 between Junctions 29 and 30, including improvements to the A229 to improve the link between the M2 and M20 (known as 'Option C variant' in DfT consultation to date). This option provides a clear opportunity for the DfT to radically improve capacity and resilience of the road network crossing the Thames, but also to provide urgently required resilience for the strategic network across Kent between the Ports (Eurotunnel and Dover), the Midlands, and the North. KCC has commissioned research into the benefits of the new crossing and concluded that Option C variant has the greatest economic benefits, primarily through job creation and housing growth. The improved connectivity resulting from the new crossing would attract businesses to north Kent/south Essex. Improved journey time reliability would enable residents to access more employment opportunities, effectively increasing the size of the labour market.

A KCC commissioned study by KPMG in 2010 concluded that a new crossing to the east of Gravesend would directly create 6,000 jobs and contribute £12.7 billion to local GVA. In a further study, URS (2012) carried out demand analysis showing that the new crossing would improve development viability and unlock economic growth. By implementing Option C variant in conjunction with upgrades to the A2/M2 corridor (M2 Junction 7 improvements and dualling the A2 north of Dover) a second strategic route between Kent and the North would be created, which is vital to keep London and the rest of Britain connected to the Port of Dover. Another study commissioned by KCC (Gowlings, 2012) has shown that there is a high level of interest from potential financiers, meaning that it is an attractive investment that could be delivered quickly by the private sector.

As the growth of London extends eastwards, the infrastructure required to support it also supports Kent. KCC believes that the current level of congestion at the existing crossing, along with forecast traffic growth and the significant scale of potential development, means that a third crossing should be the top priority and included in the NIC's strategic vision for large-scale transport improvements in London.

The linking of HS1 and HS2

KCC has specifically raised the importance of a dedicated link between HS1 and HS2 through joint meetings with the London Boroughs of Hackney and Newham and other stakeholders who are equally determined to see the installation of what many regard to be a missing link in the eventual High Speed (HS) network. Originally the draft hybrid bill for HS2, phase 1 (London - Birmingham) included such a dedicated link, which would have left HS1 just to the north of St Pancras and joined HS2 to the north of Euston. However, to reduce the estimated costs of HS2 and to speed the bill's progress through Parliament, the link was removed from the hybrid bill.

The current draft legislation will therefore result in a gap, of no more than about two or three miles, between the London termini of both HS rail routes. The strategic opportunity of operating through domestic, and eventually international, services between locations north of London, Kent and continental Europe will have been missed.

KCC regards this missing link as an essential piece of London's transport infrastructure, and urges the NIC to consider the options for funding and Parliamentary support required for its delivery. We have seen in Kent the transformational effects of HS1: wider opportunities for travel to employment, leisure, business and higher education. It would be a missed opportunity for London's transport network if this short distance between HS routes were not bridged by a dedicated link. It would not need to be at the full high speed of either HS1 or HS2, but it must be included in any future list of key infrastructure transport projects in the capital.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

Crossrail 1 extension from Abbey Wood to Ebbsfleet and Gravesend

It is in the context of both the approved route of Crossrail 1 to Abbey Wood, and its putative extension eastwards, that KCC would support in principle the proposal for the Crossrail 2 scheme. The interchange between both Crossrail routes at Tottenham Court Road would be a key interchange in Central London, and would offer a wide range of journeys by rail with just one change for Kent passengers.

The principal large-scale rail transport infrastructure improvement that KCC would support would be the eastwards extension of Crossrail 1 from Abbey Wood to Ebbsfleet and Gravesend. An officer working group, led by the GLA and TfL, and including KCC and other interested authorities, is engaged in commissioning consultancy services to scope a Business Case into this proposal. KCC regards such an extension as essential in providing the necessary rail transport infrastructure to meet the planned growth in demand for rail transport between north-west Kent and London.

Crossrail 1 services will commence operation to Abbey Wood, which is located on the boundary between the London Boroughs of Bexley and Greenwich, in December 2018. The full Crossrail 1 route will be operational from December 2019, offering through services from Abbey Wood or Shenfield (Essex), via Liverpool Street and Paddington, to Heathrow or Reading. It will transform rail travel in and through the capital, and for Kent passengers will offer a single change at Farringdon from Thameslink services giving direct access to many West End destinations and Heathrow.

There has for been a long term aspiration held by, among others, the London Borough of Bexley for an eastwards extension of Crossrail 1. The line of route would follow the existing North Kent line from Abbey Wood, serving Belvedere, Erith, Slade Green, Dartford, Stone Crossing, Greenhithe and Swanscombe before serving Northfleet / Ebbsfleet International. It would then continue to, and terminate at, Gravesend, with turn-back and light maintenance facilities at Hoo Junction. This route has been safeguarded by all the affected planning authorities.

This project is crucial to London's transport infrastructure, as well as to that of north-west Kent and the Thames Gateway / Ebbsfleet area. It will, if approved, funded and delivered, provide a key rail transport corridor with frequent and reliable services direct to the West End and Heathrow, alleviating overcrowding and congestion on the exiting Mainline and Metro services which currently serve this and adjacent routes. It will also be imperative in providing the additional capacity required by the emerging Ebbsfleet Garden City through the Ebbsfleet UDC and, if it is approved, the proposed Paramount Leisure Park on the Swanscombe peninsula.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

In the United Kingdom, the example of Transport for the North (TfN), centred on but not exclusive to Greater Manchester, has established a template for the creation of further integrated transport authorities in other metropolitan areas. It is probable that the lessons learned in the creation and functioning of TfL, formed out of the former London Regional Transport and other transport authorities, would provide lessons and opportunities for TfN and other future transport authorities. The important point will be the opportunity for each metropolitan area to develop its own transport authority in a bespoke way that is appropriate for its location rather than to have a standard model applied throughout England.

As the largest non-metropolitan authority in England, KCC does not aspire to become its own transport authority. KCC regards the present arrangements, with significant influential input at all levels of Government, transport providers and operators by its members and officers, as the most effective way of procuring transport infrastructure in our county.

Finally, the proposed Strategic Transport Boards which are to be included in the new devolution deals will provide an opportunity for KCC to benefit from the increased level of devolved decision-making offered by Government. Following the success of the devolved funding granted through the LEPs, the new Strategic Transport Boards should enable local transport authorities such as KCC to adopt a more strategic approach to transport infrastructure investment throughout the county.

Conclusion

The provision of adequate transport infrastructure in London is key to the free movement of people, goods and services between London and the Home Counties, especially Kent. The areas highlighted above are the principal transport projects in which KCC is currently involved which have a direct bearing on this movement. KCC has also recently published its 'Growth and Infrastructure Framework' which includes estimates of future growth in employment and housing by district (including Medway). These statistics clearly demonstrate significant increases in both, especially in areas such as Ebbsfleet closest to Greater London.

The transport infrastructure for London and the greater south-east region clearly needs continued investment to ensure it is fit for purpose, for those living and working in the capital and for the ever greater numbers of people who will need to travel to London from Kent. KCC regards the work of the NIC as critical in ensuring the delivery of the transport infrastructure required to support the projected growth in employment and housing, in Kent and throughout the south-east.

Appendices

- 1 WSP Report: Southeastern Metro services – Transfer to TfL (WSP, 2013)
- 2 Crossrail 1 Eastern Extension – Economic Impact Study (TfL, 2015)

LONDON ASSEMBLY

Transport Committee | Regeneration Committee

London Assembly
City Hall
The Queen's Walk
London SE1 2AA

Lord Adonis
Chair
National Infrastructure Commission
1 Horse Guards Road
London
SW1A 2HQ

14 January 2016

Dear Lord Adonis,

Submission from London Assembly

We are writing to set out the views of the London Assembly Transport Committee and Regeneration Committee in response to the National Infrastructure Commission's call for evidence. We welcome this consultation on the major infrastructure challenges facing the UK, and hope it will lead to the Commission making a strong case for renewed investment in enhancing the transport network in London. Assembly Members look forward to discussing these issues with you further at the Transport Committee meeting on 10 February 2016.

This submission is based on the key findings of recent Transport Committee work on London's transport infrastructure in a range of areas, and the Regeneration Committee's investigation into transport-led regeneration schemes. It focuses on the delivery of Crossrail 2, upgrading and extending the London Underground, enhancing capacity on London's National Rail services, and the potential need for investment to support additional airport capacity in the South East.

The need to upgrade transport infrastructure in and around London is pressing, with the capital's population set to grow to over 10 million by 2036.¹ Huge numbers of new homes, at least 42,000 per year, must be built to address a severe housing shortage and accommodate London's growth.² As the Regeneration Committee found in its recent report, new transport infrastructure is often vital to unlocking the development of new homes and jobs.³ We are seeing this at the Barking Riverside development in east London, where the extension of the London Overground network underpins plans for around 10,800 new homes in the area.

The capital's transport network is already almost at capacity, and while Crossrail will add new capacity, London's growth means that this is likely to be fully utilised shortly after the line's opening. Meeting these needs will be challenging for Transport for London in the light of the recent Spending Review, which has put pressure on TfL's investment budget and did not include

¹ <https://files.datapress.com/london/dataset/2014-round-population-projections/update-03-2015-2014rnd-trend-proj-results.pdf>

² https://www.london.gov.uk/sites/default/files/gla_migrate_files_destination/London-Assembly-response-to-Draft-Housing-Strategy-FEB14.pdf

³ <http://www.london.gov.uk/about-us/london-assembly/london-assembly-publications/transport-led-regeneration>

any major commitment to investing in London's transport infrastructure.

Crossrail 2

The Commission is rightly focusing on Crossrail 2, a proposed scheme that has the potential to significantly increase capacity and connectivity across London and the wider South East region. The Government has previously indicated support for this scheme, although no further funding was promised in the recent Spending Review beyond the prospect of an application to the new Transport Development Fund. At the Regeneration Committee's recent briefing, Members heard that Crossrail 2 requires £250 million of development funding to ensure that the railway can be delivered by the early 2030s.

Crossrail 2 would provide sizeable economic benefits, supporting up to 200,000 new jobs, and regenerating parts of north east London that have relatively high levels of deprivation. In addition to helping meet London's housing and job needs, the timetable and phasing for Crossrail 2 is crucial so that it can alleviate crowding at Euston following the construction of HS2.

In order to provide the best value for money and take advantage of the skills and expertise developed during the Crossrail programme in London, we would recommend approving Crossrail 2 and commencing construction as quickly as possible. There are a range of potential funding sources for the scheme as a whole; TfL has suggested that, with fiscal devolution, around 50 per cent of the required funding could come from local sources.

London Underground

Of equal importance to London is the upgrade of the existing London Underground network. The tube is Britain's busiest railway and is becoming busier than ever, with records for passenger numbers repeatedly broken in recent weeks. Without a significant and sustained increase in tube capacity, the city risks grinding to a halt.

The ongoing Sub-Surface Upgrade Programme on the District, Circle, Metropolitan and Hammersmith & City lines is projected to increase overall capacity by 40 per cent on these lines by 2023. The New Tube for London programme on the Piccadilly, Bakerloo, Central and Waterloo & City lines will deliver between 25 and 60 per cent capacity increases by 2033. It is vital that TfL receives sufficient long-term funding to complete these programmes, which has not so far been confirmed.

In addition to the upgrade schemes, line extensions can also boost connectivity in and around London. In particular, we consider that the proposed extension of the Bakerloo line is a vital project for south east London. It will complement the regeneration of this area, boosting connectivity in Southwark and Lewisham in particular. It should be supported by the Commission.

National Rail

The Transport Committee has engaged with Network Rail on plans for upgrades to London's rail network in Control Period 6 (2019-2024). There are a number of key priorities for London, including releasing additional track capacity around East Croydon station, extending Crossrail to Heathrow Airport's Terminal 5, and four-tracking the Liverpool Street-Stansted route. We were pleased to see some of these projects being supported by Network Rail, although the subsequent reviews of the organisation and the delays to Control Period 5 projects have cast doubt over their future delivery. Network Rail's investment plans should be clarified as soon as possible.

The biggest challenge facing London's National Rail network is the need to move toward metro-style service provision in south London. There is a significant disparity in the city between parts able to access a high-frequency, high-capacity tube network (generally north of the River Thames), and others relying on National Rail services with much lower standards (mainly to the south). This is a constraint on economic growth and causes misery for many passengers using overcrowded, unreliable services. It is clear that this problem has not been given sufficient priority in recent years.

The Transport Committee has recently undertaken an investigation into the potential devolution of National Rail services to the Mayor and Transport for London. Devolution that has so far taken place – notably, the transformation of the Silverlink franchise into the London Overground network – has proven to be a great success. TfL has invested substantially in the network, improving reliability, capacity, service frequency and accessibility. As a large organisation with a diverse revenue base, TfL is much more able to manage the risks of this type of investment than private franchisees. We advocate further devolution, beginning with suburban routes of the South Eastern franchise in 2018, a move supported both by rail passengers both in London and Kent.⁴

Orbital rail

A more general, long-term priority for London's transport infrastructure should be the development of orbital links, whether light or heavy rail. This would support the growth of other economic centres outside the Central Activities Zone, by creating employment opportunities in areas such as Croydon. The Transport Committee also found in a recent investigation into National Rail services, that Kent-based commuters would benefit from better connections to east London, to avoid interchange in central London, which would have the additional benefit of reducing crowding for London-based passengers.⁵

Airport expansion

Finally, we would like to address the issue of surface transport access to airports serving London. We understand that the National Infrastructure Commission is not seeking views on whether or where additional runway capacity should be provided in the South East, and our comments do not indicate support for expansion. However, we believe it is vital the Commission recognises that the surface transport implications of whatever decision the Government makes – should it decide to proceed with airport expansion – are huge.

As the Transport Committee set out in a submission to the Government, the Committee is deeply concerned that the Airports Commission's final report did not set out realistic plans for how much additional transport capacity would be required to serve an expanded Heathrow Airport, or a meaningful estimate of the costs of upgrading infrastructure, if a third runway is approved.⁶ Before any final decision is made the Commission should undertake analysis to make a more informed recommendation to the Government about the surface transport implications of expansion at both Heathrow and Gatwick Airport.

⁴ <https://www.london.gov.uk/about-us/london-assembly/london-assembly-publications/devolving-rail-services-london>

⁵ <http://www.london.gov.uk/moderngov/documents/s49213/Appendix%20%20-%20Notes%20of%20Sevenoaks%20meeting.pdf>

⁶ <https://www.london.gov.uk/about-us/london-assembly/london-assembly-publications/surface-access-upgrades-essential-third>

We hope that you find this submission to be useful as you consider the transport infrastructure challenges facing London, and will welcome the chance to discuss them further with Assembly Members at City Hall in February.

Yours sincerely,

Handwritten signatures of Valerie Shawcross and Gareth Bacon. Valerie's signature is on the left and Gareth's is on the right.

Valerie Shawcross CBE AM
Chair, Transport Committee

Gareth Bacon AM
Chair, Regeneration Committee



Andrew Adonis
Interim Chair
UK Infrastructure Commission

[contact redacted]

Website: www.lbbd.gov.uk

Reference:

Date: 24 December 2015

Dear Andrew Adonis

National UK Infrastructure Commission call for evidence - London's transport infrastructure

Thank you for giving the London Borough of Barking and Dagenham the opportunity to provide our views on London's long term infrastructure needs. Barking and Dagenham is London's Growth Opportunity with the potential for 35,000 new homes and 10,000 new jobs over the next fifteen years but this is only possible with significant investment in transport infrastructure. Therefore please find at Appendix 1 the Council's response to the questions set by the Commission which we would be delighted to discuss further.

Yours sincerely

Daniel Pope
Group Manager Development Planning

Phone: 020 8227 3929

Website: www.lbbd.gov.uk

Our address: Town Hall, 1 Town Square, Barking IG11 7LU

Appendix 1

National UK Infrastructure Commission call for evidence - London's transport infrastructure

What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

- 1.1 London's population is forecast to increase to over 10 million people by 2030. Within this Barking and Dagenham's population is forecast to grow by 30% and is only second to Tower Hamlets in terms of population growth. It also has the country's youngest population. Barking and Dagenham is London's Growth Opportunity with the potential for 35,000 new homes and 10,000 new jobs by 2030. It is at the epicentre of the Royal Docks, Upper and Lower Lea Valley, London Riverside and Thames Gateway Growth Areas. The Council is committed to growth, to playing its role in London and delivering for its community. It has ambition and aspiration to become a destination of choice, where people stay and feel welcome.
- 1.2 The major economic and social challenges facing London over the next two to three decades are meeting housing need, access to jobs, health inequalities and ensuring people have the right skills to compete for tomorrow's jobs. As evidenced by the Marmot Review "Fair Society, Healthy Lives" these issues are interlinked.
- 1.3 Nowhere in London are these issues collectively more pronounced than in Barking and Dagenham. At the same time nowhere in London is there the scale of opportunity to address these challenges provided the right investment in transport and social infrastructure is secured.
- 1.4 The major issues for Barking and Dagenham are:
 - Ensuring 35,000 are delivered and that these are real homes for real people i.e. homes that people working in London can afford and chose to live in.
 - Ensuring that transport connections enable these people to access jobs in growth areas of Central London, Royal Docks and the Lower and Upper Lea Valleys.
 - Ensuring that new communities have the prerequisite social infrastructure and are designed to enable people to lead healthy lifestyles and access high quality lifelong learning opportunities to give them the skills and confidence to compete for London's jobs.
 - To deliver growth in a way which empowers people to do more for themselves whilst strengthening the institutions which support local communities. This includes ensuring the proceeds of growth are maximised to sustain vital local services.

- 1.5 If these issues are not addressed London's economy will suffer as businesses will not be able to attract employees as they will be priced out of the capital due to the double whammy of not being able to afford to either live in London or afford to commute into London from cheaper areas.
 - 1.6 There exists an opportunity to prove that London can still be a place where people on low to medium incomes can afford to live and chose to live; a city which still functions as a place; a smart place which embraces technology and real time data to enable people to live healthy and sustainable lives and to access lifetime learning opportunities; a place where development is designed to meet the needs of people of all ages, which foster social interaction, and where walking and cycling are the default options for short journeys. That place is Barking and Dagenham.
-

What are the strategic options for future investment in large-scale transport infrastructure improvements in London – on road, rail and underground including, but not limited to Crossrail 2?

How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?

What might their potential impact be on employment, productivity and housing supply in London and the south east?

- 1.7 Improved transport infrastructure is vital to London's future global competitiveness.
- 1.8 The Council is concerned that the traditional cost benefit ratio using the WebTag business case methodology fails to capture the economic benefits of the development that new transport infrastructure can unlock. For this reason the Council considers that the Gross Value Added generated by new homes and jobs must also be taken into account.
- 1.9 The Council is also concerned that the focus on funding sources such as Community Infrastructure Levy and Tax Increment Funding can work against low value areas such as Barking and Dagenham. This results in transport investment being focused in high value areas where the proceeds of development are higher and where transport schemes rely less on Government funding. However this accelerates the delivery of unaffordable homes out of the reach of normal Londoners and frustrates the delivery of real homes for London's workers in affordable places like Barking and Dagenham. These are homes for workers on low and medium incomes who are vital for the functioning of London's economy. To address this, the Council as part of the

North East London Strategic Alliance, has been making the case for the devolution of stamp duty receipts to help fund strategic transport schemes and this should be considered in the Commission's review.

- 1.10 Therefore investment in large-scale transport infrastructure improvements should be prioritised taking into account not only how much growth they will unlock but what sort of growth, who ultimately will benefit from the investment? Investment in Barking and Dagenham will benefit Londoners as it will unlock the delivery of homes within reach of the average London worker enabling them to live near to where they work. Unlike higher value areas the investment is also more critical as other sources of funding are less readily available.
- 1.11 There are four large scale strategic transport improvements in London which Barking and Dagenham consider are crucial to the success of London's economy as they will unlock the 30,000 new homes planned in London Riverside and connect them to the 215,000 new jobs planned in Canary Wharf, Royal Docks and Upper and Lower Lea Valleys. These improvements will allow people living in these new homes to enjoy relatively short journeys to work thus addressing a major factor in London's poor productivity. They will also alleviate pressure on already overcrowded transport infrastructure which is harming London's economic competitiveness.
- Crossrail 2 eastern spur
 - Riverside Tunnel and Castle Green
 - Gallions Reach River Crossing and DLR extension to Barking Riverside
 - London Overground Extension from Barking Riverside to Abbey Wood
-

Crossrail 2 eastern spur

- 1.12 There is a strong case for a Crossrail 2 eastern spur which clearly delivers significantly greater regeneration benefits than an extension to New Southgate.
- **Regeneration potential of London Riverside and wider Thames Gateway area** – Over 30,000 new homes and 10,000 new jobs are forecast to be delivered within London Riverside by 2030. This growth will inevitably lead to further pressure on already overcrowded rail services. Crossrail 2 would have a transformative affect on Barking Town Centre connecting Stratford which is East London's largest growth centre and the Thames Gateway which is the region's largest growth corridor. It is clearly an anomaly that as it stands neither London Riverside or Thames Gateway Essex is due to be served by Crossrail.
 - **Supporting population and employment growth** – In TfL's own sensitivity testing of route options for population and employment growth, it

was suggested that a Crossrail 2 eastern branch option could generate 52% of all population growth and 79% of all jobs growth in the Greater London Authority (GLA) area between 2031 and 2041 (equating to some 100,000+ extra people and 85,000+ additional jobs in that period). Whilst the borough's proposals for a Barking Town Centre Housing Growth Zone would deliver 5000 new homes over the next ten years ultimately Crossrail 2 could provide a catalyst for double this in the longer term. Moreover beyond the sites currently indentified in the London Riverside Opportunity Area Planning Framework, Crossrail 2 could reshape the industrial areas along the line by raising land values and transforming the prospects for new jobs and homes in areas currently undervalued and underutilised. These areas include Rippleside and parts of the Ford estate. The economic case for an eastern spur to Crossrail 2 is therefore extremely strong.

- **Benefits for passengers and train operations** – After Stratford, Barking is the best connected town centre in East London so it makes sense for it to be served by Crossrail 2. An eastern spur would transform Barking by providing an interchange between rail services from London Riverside and the Thames Gateway Essex growth areas. An eastern spur would provide, for people travelling from London Riverside and the Thames Gateway Essex growth areas, an interchange between Crossrail 1 and 2 services at Stratford a link to High Speed 1 and 2 at Euston St Pancras and interchange onto London Overground and London Underground services at Barking. Network Rail's long term demand projections indicate an increase in peak hour passenger demand in the range of 24% - 46% on services into London Fenchurch Street station to 2043.

1.13 The London Boroughs of Hackney, Newham and Havering and Essex County Council, have recently commissioned a joint study to explore the feasibility of an eastern Crossrail alignment and to present an outline business case for its development. It is the intention that the study, due to be completed by the end of February 2016, will provide a sound basis for further discussions with the Mayor of London, TfL and other relevant stakeholders.

Riverside Tunnel and Castle Green development opportunity

Background

- 1.14 The Roads Task Force Commission (RTF) was set up by the Mayor of London in 2012 to tackle the challenges facing London's streets and roads. This independent body brought together a wide range of interests and expertise, united in the belief that the Capital needs a long-term strategy for roads and a commitment to major investment in street management and urban design. The RTF report, published in July 2013, sets out a vision of how London can cope with major population growth and remain one of the most vibrant, accessible and attractive world cities.
- 1.15 Based on experiences of other major cities across the world it recommended undergrounding roads to reduce traffic congestion and attendant impacts and enable regeneration. In response the Mayor and TfL considered more than 70 locations across the capital for tunnels, flyunders and decking. In February 2015 the Mayor identified the A13 tunnel, between Lodge Avenue and Gale Street, as one of the top 5 locations for further feasibility. In developing business cases for these five tunnels the A13 was identified as most feasible and is now TfL's preferred scheme. TfL see this as a demonstration project with potential for application across London. It is untenable not to deal with the problems of air quality, severance and blight and inefficient land use that surface trunk roads cause across London.

Benefits

- The Riverside Tunnel unlocks land for over 5000 new homes and 1000 jobs on a development site known as Castle Green. These are additional homes to those identified in the London Plan and therefore help bridge the capacity gap the Mayor needs to cover between housing need and supply.
- This is the most prominent site in Barking and Dagenham, 100,000 vehicles pass it each day as well as thousands of commuters on the trains into and out of London. They form their image of the borough and East London from this site. The tunnel unlocks redevelopment enabling old, tired and eyesore industrial buildings to be replaced with modern visually stimulating development providing a fitting gateway to the 16,000 new homes planned at Barking Riverside, Thames Road and Creekmouth, 5000 at Barking Town Centre and 3500 at Beam Park and Ford Stamping Plant, enhancing values and increasing viability of development in these locations.
- The A13 is one of the 5 most polluted roads in London and breaches EU limits. The tunnel would be fitted with filtration system to remove pollutants significantly enhancing air quality for communities either side.

- The Riverside Tunnel overcomes the severance caused by the A13 which is a monumental psychological and physical barrier separating communities north and south and enables public transport to run between them.
- It improves journey times by removing the Renwick Road lights and Lodge Avenue flyover bottlenecks and improves resilience as the Lodge Avenue flyover is an accident hotspot and common location for breakdowns

Business case

- By 2036, more than 40% of East London's housing and 60% of jobs growth are due to be delivered within 2 miles of the A13 and the DP World port and logistics park continues to grow.
 - The Tunnel will cost £700m to construct and £260m to acquire land at today's prices. There is the potential for Community Infrastructure Levy, New Homes Bonus, road user charging and land value uplift to cover a significant proportion of the tunnel cost. This proportion could increase if stamp duty is devolved. The majority of the tunnel cost therefore is directly generated by the tunnel itself and would not be available otherwise.
 - Over the 60 year appraisal period using TfL's London Value of Time (VoT), the net present value (NPV) of the tunnel scheme is estimated at £617m due to journey time savings. These are highest for journeys of 20km plus which is why there is support from Essex MPs and it also has a positive impact for freight from Essex including London Gateway. The Riverside Tunnel generates a Gross Value Added of £791m due to the additional jobs and homes it unlocks.
 - In a 'with development' scenario, the scheme has a Benefit Cost Ratio of 1.85 representing "medium" value for money. However this doesn't account for the wider regeneration and strategic benefits that this development would unlock for London, which would include thousands of much needed homes.
 - This is not radical. It has been done in Oslo, Paris, Madrid, Boston and many other cities but it will be first of many in UK. TfL will use tunnelling expertise from major projects such as Crossrail and TfL is committed to CPO powers to assemble land at Castle Green.
-

Gallions Reach River Crossing and DLR extension to Barking Riverside London Overground Extension from Barking Riverside to Abbey Wood

- 1.16 Following the Mayor of London's decision in 2009 to abandon the Transport and Works Act for the Docklands Light Railway Extension from Beckton to Dagenham Dock the Council has worked hard with Transport for London to secure the future of the 10,800 homes at Barking Riverside by progressing the London Overground Extension as an alternative. This extension also provides passive provision for a station at Renwick Road to serve the 5000 new homes planned at Castle Green.
- 1.17 The Transport and Works Act (TWA) application for the London Overground Extension from Barking Station to Barking Riverside is due to be made in 2016 and the service is due to be operational in 2020. The S106 for Barking Riverside does not allow more than 1500 homes to be occupied until the TWA is authorised. Therefore the London Overground extension unlocks 9300 homes. However there exists capacity for a further 10,000 homes on former industrial land around Barking Riverside but this requires further transport improvements to unlock it. The Council considers that there remains a strong business case for extending the Docklands Light Railway across the River Roding to supplement the London Overground Extension and to deliver a further 10,000 homes.
- 1.18 Transport for London recognise this and as part of the current consultation on River Crossings have put forward a number of options for future extensions of the DLR including options across the River Roding to either Barking Riverside or Barking.
- 1.19 This would provide a convenient link to the 1000s of new jobs planned at the Royal Docks and the Crossrail Station at Custom House as well as potentially provide a link to growth areas south of the River and allow the London Riverside and Royal Docks Opportunity Areas to be planned and to function as one integrated growth zone.
- 1.20 The Mayor's Infrastructure Plan and his recent publication "Connecting the Capital" supports the proposal for a further extension of the London Overground line from Barking Riverside to Abbey Wood Crossrail Station. This is the missing link in the Mayor's aspiration to create a London orbital railway and would unlock the growth potential of the Thamesmead and Bexley Opportunity Area which has capacity for 21,500 homes and 8,500 jobs and also provide a convenient link from Barking and Barking Riverside to the Abbey Wood Crossrail Station.
- 1.21 Collectively the London Overground Extension with new stations at Renwick Road and Barking Riverside with an interchange at Abbey Wood and a DLR Extension to Barking Riverside and potentially Dagenham Dock would serve

50,000 new homes a similar number of homes to those planned in the Upper and Low Lea Valleys combined.

National Infrastructure Commission
1 Horse Guards Road
London
SW1A 2HQ

19th December 2015

Dear National Infrastructure Commission,

RESPONSE TO NATIONAL INFRASTRUCTURE COMMISSION CALL FOR EVIDENCE

Please accept this letter as London Borough of Brent's response to the National Infrastructure Commission's (NIC) call for evidence on the following three issues:

1. Improving connectivity between cities in the north of England
2. Large-scale transport infrastructure improvements in London
3. Improving how electricity demand and supply are balanced

Brent appreciates the opportunity to contribute towards the NIC's work and the Borough supports the process currently being undertaken by the Commission. The following response has been prepared based on the questions put forward by the NIC for each issue.

ISSUE 1: IMPROVING CONNECTIVITY BETWEEN CITIES IN THE NORTH OF ENGLAND

Brent has no comment on the issue of connectivity between cities in the north of England. We support Local Authorities in the north of England who wish to comment on this issue.

ISSUE 2: LARGE-SCALE TRANSPORT INFRASTRUCTURE IMPROVEMENTS IN LONDON

Q1: What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

Brent is facing many of the same economic and social challenges as London and the United Kingdom as a whole. Sustained high population growth is a challenge across many policy areas, including housing, transport and employment. Brent's population is projected to grow by 24% to almost 390,000 over the period from 2012 to 2036 compared to 22.5% growth London-wide over the same period¹. This growth will place greater pressure on housing and services which are already straining to cope with record populations and usage, such as transport. In addition, it's a continuing challenge for the borough to support employment growth within the borough to provide jobs and economic stimulus for residents.

In recent years, the dynamic of these challenges has also changed, with greater focus on sustainable development. This trend is likely to continue in the future, with an increasing focus

¹ Office of National Statistics, 2015, *ONS 2012-based subnational population projections*, [Sourced from London Datastore] <http://data.london.gov.uk/dataset/ons-2012-based-subnational-population-projections/resource/dfdd7444-ea66-4a27-91ffa95fdc9fe611#>

on car-free development and localised employment and services, thus reducing the need to travel, along with the provision of sustainable transport options, such as walking and cycling in addition to public transport.

In order to deal with these challenges, significant investment is required in local transport infrastructure, including resolving existing maintenance requirements on local road networks. At the same time, investment is also required in large both new large-scale infrastructure (such as the Crossrail/West Coast Main Line link) and the modernisation of existing infrastructure (such as the Bakerloo line modernisation).

Q2: What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

Brent believes that the greatest opportunity for investing in transport infrastructure in London is not in the strategic network, but in the local network. It is local transport networks which are currently suffering from deferred maintenance and lack of investment due to funding cuts, while additional funding is being made available for strategic transport networks, which, while important, do not carry the vast majority of vehicles (either passenger or freight) and can not support economic growth without a well maintained local network. At the same time, we recognise that funding must be provided to the strategic network as well. We do not see the demands of the different networks as an 'either-or' scenario, rather investment must be directed towards both networks to ensure the delivery of high quality national transport networks which support economic growth and improve peoples' wellbeing.

At a strategic level (both nationally strategic and regionally strategic), there are a number of major schemes which Brent supports:

West Coast Main Line / Crossrail link:

This project is Brent's highest priority transport project, on the condition that Crossrail trains call at Wembley Central Station. This project will support substantial regeneration in Wembley, along with providing high speed, high quality access for residents and businesses to Central London, Heathrow and the rest of the nation via the Old Oak Common Interchange.

Brent continues its work with Transport for London (TfL) on this issue and we would encourage Central Government and any other stakeholder to support it.

Upgrade and extension of the Bakerloo Line:

In addition to supporting growth in southeast London, the Bakerloo line currently has the oldest rollingstock on the London Underground network, dating to 1972. These trains are in considerable need of renewal, in addition to the need to modernise track and signalling along the route.

An upgrade of the Bakerloo Line, completed in conjunction with an extension in southeast London would improve access to public transport, reduce car usage and associated emissions and congestion across northwest London. The extension would support regeneration in Wembley, South Kilburn and Old Oak Common / Park Royal, improve journey times and provide better connections, improving public transport capacity and passenger satisfaction along the length of the Bakerloo Line.

High Speed 1 / High Speed 2 link:

While this project has been excluded from the HS2 Hybrid Bill, currently before parliament, Brent believes it is essential towards achieving a comprehensive national High Speed Rail network in the future. At the same time, the previous proposal via the North London Line in Camden, impeded the capacity of this route and would have had a detrimental impact on local communities.

An improved solution needs to be developed now, so that other projects do not jeopardise the practicality and deliverability of this link in the future.

Electrification of transport networks (road and rail):

Brent supports the electrification of transport networks (including both road and rail vehicles) for both freight and passenger services. While rail electrification works are planned with lengthy lead-in periods, the electric vehicle market is less certain, and as these vehicles become cheaper and more widely spread, there is a risk that domestic energy consumption could rise considerably for these vehicles. This could potentially require additional infrastructure to support these vehicles.

Increasing the uptake of electric vehicles in commercial fleets and household vehicles is predicated on having sufficient charging infrastructure to give people the confidence to switch to a hybrid or fully electric vehicle. Domestic infrastructure, coupled with nation-wide charging infrastructure is essential to ensuring that the nation's homes, offices businesses are prepared for zero-emission vehicles of the future.

Freight transport networks:

An essential requirement of any strategic infrastructure is the provision for freight to utilise the network. Pursuant to this, where possible, Brent strongly supports the relocation of freight from road haulage to rail, given the impacts on local amenity of poor air quality, traffic noise and safety risk of freight vehicles. We also support maintaining and/or improving access in the form of service slots and sidings for freight to rail networks, such as the West Coast Main Line, Dudding Hill Line and the Midland Main Line.

Cycling infrastructure:

While cycling infrastructure has generally not been considered to be strategic infrastructure, with the addition of high-capacity cycling infrastructure currently being constructed and/or planned across Greater London, along with the demand for greater cycling provision means the scale of infrastructure and popularity of cycling is increasing. The greater number of cyclists will generate additional demands on strategic road networks and for regional cycling infrastructure. These considerations should be taken into account both for strategic planning and in assessing individual traffic schemes.

Resolution of London's air capacity issue:

In February 2015, Brent Council wrote to the Davies Commission to recommend that of the three options being considered to increase London's air capacity, Brent's preferred option was the Heathrow Northwest Runway. The Davies Commission agreed with this and recommended the government move forward with this option. A final decision on how the government will proceed has been delayed several times. Ongoing uncertainty regarding whether an additional runway will be built at Heathrow or Gatwick Airports, or not at all affects the planning and transportation decisions being made by Brent, other Local Authorities and TfL. Resolution of this issue needs to be a priority in consideration of national infrastructure.

Q3: What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Brent understands that Transport for London has already undertaken considerable work to evaluate and increase the benefits of the proposed Crossrail 2 scheme. In spite of not being located on the route for Crossrail 2, Council officers have been kept abreast of the project's evolution as there are potential long-term impacts for the borough in relation to connections to Crossrail 1 (at Tottenham Court Road) and HS2 (at Euston), along with the interchange between these two projects at Old Oak Common.

Given that the opportunities for increased benefits will come with greater demands on local authorities along the route, Brent will reserve contribution on this question to those authorities.

Q4: What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

Brent supports the funding arrangements for Crossrail 2, as currently outlined by TfL. We believe that it is fair and reasonable that large-scale, transformative infrastructure projects (including Crossrail 1 and Crossrail 2) should be funded by a combination of Central Government funding, Greater London Authority (GLA)/TfL funding, S106/Community Infrastructure Levy development contributions and localised business rates supplements for beneficiaries of the scheme.

A key consideration of equity which must be addressed for Crossrail 2 and future regional schemes such as this is the disparity of power for enforcing localised contributions between local authorities under the GLA and those located in the Home Counties. It certainly is achievable to come to negotiated settlements on funding agreements with these local authorities, however the Mayor of London does not have any authority to enforce them outside of the terms of the agreement. This will be of particular concern for Brent in support of the Crossrail / West Coast Main Line link, which will travel through the London Boroughs of Brent and Harrow, before continuing through Three Rivers District, Watford, and Dacorum Councils, which are all located outside of Greater London.

Q5: How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

No specific comments on this question.

ISSUE 3: IMPROVING HOW ELECTRICITY DEMAND AND SUPPLY ARE BALANCED

We have no specific recommendations for action on this issue, however we would note our concern regarding the challenge of ensuring continuity of electricity supply (across both the high voltage and low voltage networks) given projected population and employment growth, particularly in areas designated for regeneration, such as Old Oak/Park Royal. Of interest to the Council is how these services will be accommodated; particularly where they are proposed within the public highway and may affect transportation networks, other services or potential infrastructure improvements. In addition to this, Brent would be interested in opportunities for data to be shared, and upgrade works to be coordinated between utility providers so as to minimise disruption to residents and businesses.

I trust this response has been of some assistance, however if you have any questions, please feel free to contact our Transport Planner, Chris McCanna, on 020 9387 5424.

Thank you for your consideration.

Yours sincerely,



Tony Kennedy
Head of Transportation

London Borough of Camden's response to National Infrastructure Commission Call for Evidence – London's Transport Infrastructure

1. General comments

This response has been agreed by Camden's Cabinet Member for Regeneration, Transport and Planning.

Answers are given below to Questions 1-3 in the call for evidence. Further evidence is set out under 'References' at the end of this submission.

2. Question 1 - What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

Camden has a very successful and diverse economy and it makes a significant contribution to the UK economy (with the 5th largest GDP of any local authority district in the UK) and is a key part of Central London's economy owing to its concentration of businesses, retail and tourism (Camden's GDP is the third largest of any London borough after the City of Westminster and City of London).

The borough is forecast to grow from 229,700 residents (in 2013) to over 265,000 by 2031 and the number of jobs to increase from 286,000 to 375,000 by 2031. This builds on historic rates of high growth recorded in Camden. Between 2004 and 2014 residents numbers grew by 13% while employment levels increased by 30%.

The level of development activity attests to the attractiveness and dynamism of Camden's local economy. In the decade 2005-15, 7,493 homes were built and 689 schemes involving employment floorspace were completed creating 453,742 sqm of office/industrial/warehousing floorspace and 59,000sqm of retail floorspace.

The London Plan housing target for Camden is about 8,900 additional homes from 2015-25 however London boroughs are advised to achieve and exceed this target in order to close the gap between London's needs and the supply of housing. LB Camden's emerging Local Plan aims to deliver a minimum of 16,800 homes from 2015-30 (including over 11,000 self-contained homes¹). A profound shortage in the number of affordable homes in London and the rapid growth in house prices and rents mean that more people are choosing to live outside the capital increasing the levels of commuting. A million people currently are commuting across Greater London's boundary every day into the capital. Without significant growth in the provision of affordable housing there is a risk that many businesses and the public sector will experience greater difficulty in attracting and retaining staff. Rising housing costs mean that residents are faced with spending an increasing proportion of their income on housing or living in cramped accommodation.

Camden's 'daytime population' already approximately doubles due to the influx of workers, let alone students and visitors travelling into the borough daily for a variety of purposes. Camden's night-time economy is also significant. In addition we have large numbers of people in transit throughout the borough. With population growth

¹ Self-containment is where all the rooms in a household's accommodation are behind a single door which only that household can use.

expected in the region of 2,300 people a year until 2031, the challenge is to ensure that this is supported by healthy and sustainable transport choices. Camden's screenline counts show that between 2006-2014, trips by car reduced by 13% - a trend which is expected to continue as the proportion of households without access to a car continues to increase (from about two-thirds currently). A sharp increase in cycle journeys has also been recorded. In 2006, cycling represented about 7.6% of Camden's traffic flow but in 2015 it was 13.6%. This is expected to continue to increase as a result of major investment in the cycling network in Camden and London.

3. Question 2 - What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

- How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?
- What might their potential impact be on employment, productivity and housing supply in London and the southeast?

Crossrail 2

Transport for London consultation exercises have demonstrated that the 'regional option' of Crossrail 2 has greater support than the 'metro option' and is better suited to meet the needs of London's growing population and employment. It provides new connections across the London region directly into the heart of the capital and opens up significant regeneration opportunities, particularly by increasing the scope for new housing that London needs in areas such as the upper Lee Valley. Camden Council has recently provided a detailed response to the Crossrail 2 Growth Commission – call for evidence, which is attached to this submission.

In summary, the Council supports the principle of Crossrail 2 because of the benefits that it offers to Camden residents, businesses and institutions and to London as a whole. Through increasing capacity and connectivity, Crossrail 2 would support the conditions for continued economic growth, bringing vital jobs and business activity to the borough. By reducing congestion on current transport routes the scheme could mean faster and less crowded train and bus journeys for Camden's residents and visitors. Without Crossrail 2 the Underground platforms at Euston, already operating close to capacity, would not be able to cope with the additional demand generated by High Speed 2 leading to the intermittent closure of Euston Underground station when demand related to HS2 and National Rail services peaks. This would be similar to the intermittent closure of Oxford Circus Underground station currently experienced.

The current plans for the Crossrail 2 station at Euston show that around 130 homes and 17 businesses may be directly affected by its construction. These proposals have come about as a result of uncertainty over the redevelopment of the current Network Rail station at Euston which fails to realise the opportunity to incorporate the

renewal of the 'classic' Network Rail station as part of the proposed build programme.

A large proportion of this impact – and cost - is unnecessary and could be avoided by re-locating the proposed Crossrail 2 station entrance within the footprint of a redeveloped Euston station. A comprehensive redevelopment of the station integrating Crossrail 2, High Speed 2 and the 'classic' Network Rail station would deliver ongoing efficiencies and a better passenger experience at the interchange in perpetuity and mean the full opportunities for development and growth can be realised.

Euston Station comprehensive redevelopment

The most significant barrier to the delivery of additional growth at Euston is the risk of failing to integrate and co-ordinate the redevelopment of the existing Euston Station in conjunction with the proposals for the High Speed 2 and Crossrail 2 stations. By co-ordinating projects there are opportunities to share worksites, speed up delivery, reduce land take and create a comprehensive redevelopment above an integrated jointly delivered transport interchange between High Speed 2, commuter lines, the Underground, buses and Crossrail 2.

The Euston Area Plan (EAP) is the agreed opportunity area planning framework for Euston, jointly prepared and adopted by Camden Council, the Greater London Authority (GLA) and Transport for London (TfL) with HS2 and Network Rail providing technical support. It sets out the potential for transformational development and regeneration above and around the station with the potential to deliver 2,800-3,800 new homes (including the delivery of much needed affordable homes) and 7,700-14,100 new jobs. This vision encompasses a high quality development around a world class transport interchange, resolving the issues around movement between rail, Underground, bus and taxi services and would reconnect communities to the north, south, east and west. Links between the station and the surrounding street network are poor and the linear bus street at the front of the station is a barrier to permeability and provides a poor environment. Investment in the public realm and facilities for cyclists would help provide a more legible and safe environment and support non-polluting and healthier means of travel.

The Euston Growth Strategy (prepared by Camden Council, the GLA, TfL and Network Rail) indicates that a comprehensive redevelopment could generate a development value of circa £3bn, an additional £1.1bn of GVA per annum and return approximately £1.3bn to the exchequer up to 2060.

The lack of funding for the redevelopment of the classic Network Rail station puts the delivery of the shared strategic vision and development parameters set out in the Euston Area Plan at risk. Without a comprehensive approach to the station the significant growth and regeneration potential at Euston will not be fully realised. The benefits of much increased permeability, connectivity and ease of movement will be compromised and this uncertainty mars the prospect of harnessing developer interest in a comprehensive approach. Failure to bring about the timely redevelopment of the Network Rail station would prolong the severity and duration of

impacts on the local community which are already set to experience 17 years of construction disruption from High Speed 2

The existing station is no longer considered to be fit for purpose and fails in many respects. It provides an extremely poor station environment with limited facilities for passengers and is regularly overcrowded. Accessibility to the station and connectivity across its site between the track, concourse and surrounding street network is far below the standard which would be expected of a nationally important rail terminus and interchange and moreover one that is likely to become the UK's largest transport hub. There is an opportunity to create a station that the country can be proud of.

Growth in passenger demand from the West Coast Mainline on its own supports the redevelopment of the Network Rail station. Increasing congestion within the station building will worsen the experience of passengers using the station still further and be detrimental to its role as a key 'gateway' to London. Despite its strategic importance to London's economy, there is a sense that Euston station has been left behind as other London termini (King's Cross and London Bridge) have benefitted from significant investment to increase capacity and improve the passenger environment.

High quality development is capable of being delivered above and around this station to make efficient use of this Central London location in a way which delivers clear benefits for Camden's residents and businesses. The Council has evidence which suggests that a level deck solution, where the tracks of the classic rail station are sunken alongside the High Speed 2 tracks, would maximise the benefits realised from a comprehensive scheme. It would facilitate additional and larger development plots within the station complex. The construction of a platform above the existing station is capable of accommodating significant levels of development without causing detrimental effects (e.g. on the designated viewing corridors).

Development at Euston is well placed to build on growing cluster of high tech and knowledge based industries and institutions in this part of Camden. Further expansion and growth of these knowledge industries is expected to occur over the next decade. This 'knowledge quarter' includes the British Library, University College London and University College Hospital. The construction of the Francis Crick Institute is nearing completion and organisations such as Google and the Alan Turing Institute for Big Data will be moving into this area. Euston station is also close to Camden Town and capable of supporting the growth and regeneration expected to occur there.

Camden Council asks that a recommendation is made by the National Infrastructure Commission to the Secretary of State for Transport and the Chancellor of the Exchequer to accelerate the process of bringing forward funding for the redevelopment of the Network Rail station so there is one integrated development of the station (i.e. NR and HS2) undertaken in the same timeframe, with Transport for London's plans for Crossrail 2 fully integrated into the scheme. We also suggest that Euston Station could form a case study for the Commission to consider in further detail.

Improve orbital routes and provide new rail connections

Since Transport for London took over responsibility for rail services on lines now comprising the Overground network ridership has increased markedly. The growth in ridership cannot be solely attributed to conventional elasticity factors such as increases in rail services levels and background growth factors associated with rising population and employment, but to other factors such as improved connections, marketing, information, wayfinding within stations, re-staffing of stations late at night and quality of rolling stock and improved performance (*London Overground Impact Study*, for Rail and Underground Panel, TfL, 16 November 2011).

The extension of the Gospel Oak Barking (GOB) line to Barking Riverside will also enable regeneration of this area and bring similar benefits as those set out above for Crossrail 2. Funding has been committed for the electrification of the GOB line and this is planned to be finished by 2017. The extension of the Northern line to Battersea will have similar benefits to the GOB extension.

The proposed 2 new Overground stations at Old Oak Common (at Old Oak Common Land and Hythe Road) will help transform this area into an important new transport hub, linking with High Speed 2 and Crossrail and the regeneration area there, although funding for these stations has not yet been fully identified.

In making improvements to orbital and other rail services in London particular consideration should be given to improvements that maximise the use of existing infrastructure (thereby giving good value for money), that involve new connections and as far as possible that can be made within existing rail lands so as to minimise objections and reduce costs. Examples include the West Coast Main Line to Crossrail link (which would extend Crossrail westwards making better use of the new Crossrail tunnels, and would facilitate the reorganisation of terminating rail services at Euston for the comprehensive development of that station as described above) and the four tracking of part of the West Anglian Main Line that recently became part of the Overground. These two examples are not yet fully funded and should be priorities for investment.

Major works at selected Underground stations

The growth of rail ridership on the Underground necessitates major works at certain Underground stations to increase capacity for passenger movements within these stations for a variety of purposes including improving operational safety and enabling enhancements to existing rail service levels. Examples of projects that are currently being investigated or seeking powers but are not yet fully funded include Holborn, Bank and Camden Town, and these should be priorities for investment.

The fully funded Northern line Extension to Battersea between the Charing Cross and Bank branches facilitates the separation of the Northern line; trains crossing one another to travel to different branches at Kennington and Camden Town reduces train frequencies so works at these stations ultimately enable greater capacity for the entire Northern line. Higher throughput of trains at Bank station on the Northern line threaten the operability of this station, hence the advance works being programmed for this station. The Northern line extension to Battersea includes the building of more cross-passenger tunnels at Kennington to facilitate interchange between the

branches of the line and it is imperative that funding is provided for this approach at Camden Town station for the same reason.

Step free access at rail stations

In recent years works that provide step free access from the street, through a station and onto platforms has been undertaken in numerous stations in London including Camden. This has opened up rail services to those with ambulant difficulties, bringing economic and social benefits. These benefits increase more than pro rata as additional stations are improved, widening the network of stations that can be used. This programme of improvements should be continued, with priority given to well-used stations and those stations that are important hubs within London's transport networks. For example, the Thameslink and Overground stations in West Hampstead are being made step free, so if the Underground station at this location were made step-free the benefits would be wider than those that would be attributed to this station alone - given the wider network that would accrue by passengers interchanging onto the other very nearby stations at this location.

Rail station improvements and relationships to the surrounding urban realm.

The provision of new rail lines or improvements to particular stations should not be looked at in isolation. The urban realm outside stations should also be improved to provide better interfaces with connecting modes and to land-use developments that will be encouraged by rail improvements. The integration of transport and land-use planning improves public transport ridership and regeneration potential creating a virtuous circle of change. For example, the Council has been working with partners to harness the benefits of the new Crossrail station at Tottenham Court Road through 'The West End Project'. This is intended to transform the public realm, improve movement through the area and boost business activity.

Improving cycling infrastructure

Currently Camden is making substantial additions and improvements to its cycling infrastructure. By the end of 2015, Camden has doubled the amount of segregated cycle lanes in the past two years and by the end of 2016 Camden plan to have over 10km of new and improved segregated cycle lanes in the borough linking many of the boroughs town centres to each other and to the West End and City. The rapid development of cycling facilities (whether segregated or not) is resulting in a marked growth in cycling – by 2% from 2014 to 2015 alone to bring the cycle market share to 13.6% borough-wide for daytime traffic flows. South of Euston Road cycling accounts for more than 23% of daytime traffic. This supports sustaining increased levels of investment in cycling infrastructure for all types of rider.

4. **Question 3 - What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?**

The comprehensive redevelopment of Euston Station would provide opportunities to reduce the cost of delivering the Euston-St Pancras Crossrail 2 station and increase the benefits of the proposed scheme. This would be unlocked through aligning the Crossrail 2 programme with the redevelopment of the classic Network Rail station at Euston, and a commitment to the funding of both projects. Uncertainty over the redevelopment of the current Network Rail station and lack of a comprehensive plan for Euston Station has resulted in the current proposals which would lead to the demolition of over 130 homes, 17 businesses and community facilities. The costs of acquiring this property and providing adequate compensation to landowners adds significant unnecessary cost to the project. The impact on residential property at Euston is greater than at any other proposed Crossrail 2 station.

Both the cost and impact on residents and businesses in the Euston Area could be significantly reduced by a comprehensive approach to the station encompassing High Speed 2, the redevelopment of the classic Network Rail classic station and any new Crossrail 2 station. This would allow for re-location of the proposed Crossrail 2 entrance to a site within Euston station, the opportunity to share worksites, speed up delivery and reduce land take. This would avoid the highly detrimental consequences of demolition in the area north of Grafton Way to allow for the construction of a new station entrance and box.

The Tottenham Court Road Crossrail 2 station is currently proposed to have a southern entrance in Shaftesbury Avenue and a northern entrance on Oxford Street at Rathbone Place – both wholly within Westminster. At this early stage of the project the details are under discussion, however the Council is seeking a northern exit on Tottenham Court Road itself as this would build on the regeneration benefits in this area which are starting to be realised through the West End Project and the increased capacity of the Northern and Central line ticket hall. Transport for London is aware of this possibility and is looking at options.

As part of its representation to Transport for London on Crossrail 2, the Council has highlighted the significant impacts on Camden residents living in close proximity to the proposed Rathbone Place entrance (in Westminster). It is likely that this entrance would become a major pedestrian trip generator and may not be the optimal location in terms of pedestrian wayfinding and connectivity to the wider area. For this reason and the potential adverse impacts of the construction works on Gresse Street residential property, we have asked TfL to fully investigate alternative sites.

References:

Euston Area Plan (adopted by Camden Council 2015)

<https://www.eustonareaplan.info/>

Euston Growth Strategy (November 2015)

<http://www.eustonareaplan.info/documents/> : under 'Other Documents'

Please see below a copy of LB Camden's submission to Crossrail 2 Growth Commission

CROSSRAIL 2 GROWTH COMMISSION: CALL FOR EVIDENCE

SUBMISSION BY LONDON BOROUGH OF CAMDEN

23.12.15

1. Introduction

If Crossrail 2 goes ahead, Camden will be the host borough to two Crossrail 2 stations at Euston St. Pancras and Tottenham Court Road. The London Borough of Camden therefore welcomes the opportunity to submit evidence to the Crossrail 2 Growth Commission. This submission covers:

- Overview of Camden's current position on Crossrail 2
- The need for a comprehensive approach at Euston encompassing HS2, Crossrail 2 and the Network Rail Stations
- The growth and regeneration benefits of the comprehensive approach
- Tottenham Court Road

Further detail can also be found in the London Borough of Camden's draft submission to TFL's current consultation on Crossrail 2.

2. Overview of Camden's position on Crossrail 2

Camden Council supports the principle of Crossrail 2 because of the benefits that it offers to Camden residents, businesses and institutions and to London as a whole. Through increasing capacity and connectivity, Crossrail 2 would support the conditions for continued economic growth, bringing vital jobs and business activity to the borough. By reducing congestion on current transport routes the scheme could mean faster and less crowded train and bus journeys for Camden's residents and visitors, and better access to employment opportunities. However, we are opposed to the current plans as written due to their impact on residents and businesses at Euston.

In total, the proposals would require the demolition of approximately 131 homes and 17 businesses. The impact on residential property at Euston is greater than at any other proposed Crossrail 2 station. A large proportion of this impact is unnecessary and could be avoided by re-locating the proposed Crossrail 2 station entrance to a site within Euston station. The demolition affecting the area north of Grafton Place, to allow for construction of a new station entrance and box and for some of the station tunnelling works, is a direct consequence of uncertainty over the redevelopment of the current Network Rail station as part of a comprehensive Euston Station Plan. This site contains 71 homes including 45 in the Council-owned Wellesley House. The resultant impact on residents and businesses is unacceptable and Camden Council cannot support the project in its current form.

However, in early December the Secretary of State for Transport provided a number of assurances to Camden linked to the HS2 Hybrid Bill proposals for Euston. These assurances, explored further below, provide an opportunity to revise the Crossrail 2 proposals and significantly reduce the impact on residents and businesses in the Euston area as well as to deliver a better transport solution. This can though only be unlocked by aligning the Cross Rail 2 programme with the redevelopment of the classic Network Rail station at Euston, and a commitment to funding of both projects.

3. The need for a comprehensive approach at Euston

The most significant barrier to delivery of additional growth at Euston is the risk of failing to comprehensively redevelop the existing Euston Station as an integral part of the delivery of the HS2 and Crossrail 2 stations. By coordinating projects there are opportunities to share worksites, speed up delivery, reduce land take and create a comprehensive redevelopment above an integrated jointly delivered transport interchange between HS2, commuter lines, the underground, buses and Crossrail 2.

LB Camden have been lobbying individually through the HS2 Select Committee process and through our Euston Strategic Board (a joint board with the Deputy Mayor of London, HS2, Network Rail and DfT) to secure funding to integrate the delivery of the projects, and in particular to secure funding to redevelop the existing station within a complementary timescale to the Crossrail 2 project.

LB Camden secured a number of assurances on this through the HS2 petitioning process, which include the setting up of a new Euston Station Strategic Redevelopment Board with members from LB Camden, GLA, TfL, Network Rail, DfT and HS2 which has a responsibility to integrate the delivery of the HS2 station, the redevelopment of Euston Station, Crossrail 2 and over site development and advises the Secretary of State for Transport. This is welcomed, but there is still currently no funding committed to redeveloping the existing Euston Station in the timescales required to prevent extra land take for Crossrail 2. As currently programmed a

preferred option for the design of a redeveloped classic station will not be known for a further two years which is out of sync with both the CR2 and the HS2 station design process.

LB Camden considers that the design of all the stations needs to be undertaken at the same time to enable the full potential growth and regeneration benefits and to deliver a world class station with high quality development above and around it. This provides the opportunity to integrate the Crossrail 2 station and remove the need for the demolition of as many homes and businesses. TfL have indicated that this could also be more effective in reducing passenger congestion on the Victoria Line and Northern Line, a key objective of the Euston Crossrail 2 station. Communities surrounding Euston are already set to endure 17 years of construction disruption arising from HS2. Integrated design of the Crossrail 2 works would provide the opportunity to co-ordinate works to minimise the severity and duration of construction impacts on already severely impacted local communities.

4. Growth and regeneration benefits of the comprehensive approach

The Euston Area Plan (EAP) is the opportunity area planning framework for Euston, jointly prepared and adopted by Camden Council, the GLA and TfL. It sets out the potential for transformational development and regeneration above and around the station and this envisages the delivery of between at least 2,800 and 3,800 new homes and 7,700 and 14,100 new jobs. The vision encompasses a high quality development with a world class transport interchange and reconnected communities to the north, south, east and west.

The Euston Growth Strategy, prepared by Camden Council, the GLA, TfL and Network Rail in close consultation with HS2, indicates that a comprehensive redevelopment of the station area alone could deliver up to 16,200 jobs and 2,200 homes which could in turn generate a development value of circa £3bn, an additional £1.1bn of GVA per annum and return approximately £1.3bn to the exchequer up to 2060.

The council has further evidence which suggests that a level deck solution for Euston station, where the tracks of the classic network rail station are sunken alongside the HS2 tracks, can provide even greater returns whilst significantly enhancing the regeneration potential in line with the objectives of the Euston Area Plan. This should be explored with the integration of the CR2 station at Euston.

The Euston Growth Strategy includes five recommendations:

- A commitment to comprehensive redevelopment at Euston

- Comprehensive master planning, design and engineering (including HS2, the classic station and Crossrail 2)
- Easing rail capacity to get Euston right
- Upfront funding for over-site development enabling works
- A local skills and employment strategy to get our people ready

The assurances provided to the Council by the secretary of state are a significant progression of the first two recommendations and further work with the partner organisations is currently ongoing to take this forward.

To allow for the design and reconstruction of the station while maximising operating flexibility, measures to ease capacity at Euston should be considered and implemented. The delivery of HS2 and Crossrail 2 are interlinked, as TfL predicts that onward passenger demand from HS2 (Phase 2) passengers arriving in Euston requires the delivery of Crossrail 2. Other measures, such as a link at Old Oak Common, from the West Coast Mainline to Crossrail 1 and other measures should also be considered.

Securing funding for a development deck and over-site development (OSD) enabling works across the whole station site, including any Crossrail elements will also be essential for achieving growth. So far funding is only in place for the OSD enabling works above the HS2 station.

Measures to ensure growth delivers real benefits for local people and businesses are essential to the success of any scheme. The growth strategy seeks the development of a local skills and employment strategy to get our people ready. As part of the HS2 assurances, the secretary of state has committed funding towards a construction skills and training centre at Euston, building on the model established at the King's Cross Construction Skills Centre. This will provide real opportunities for local people to access jobs in the construction industry. Given the scale of CR2 in Camden, we would ask that Crossrail 2 commit to funding and working with the Construction Skills Centre to support Londoners to access employment on these major infrastructure projects.

5. Tottenham Court Road

The Tottenham Court Road area is already undergoing substantial works, many of which are associated with Crossrail 1. The area is also located at the borough boundary between Camden and Westminster and is already densely developed and highly populated. The Council is concerned about the potential impacts on Camden residents living in close proximity to the site and the siting of the entrance at Rathbone Place, as raised in the Council's draft Crossrail 2 consultation response. There are also concerns about the impact of further

disruption on local businesses, which would need to be carefully managed and minimised. Any further opportunities for growth are likely to be more limited and dependent on the station option taken forward.

London Borough of Croydon Response to National Infrastructure Commission Call for Evidence

London's transport infrastructure

January 2016

Introduction

Thank you for the opportunity to provide evidence to the Commission on London's transport infrastructure needs.

Croydon is a member authority of the South London Partnership (SLP) and London Council's, both of which are responding to the Commission's current call for evidence. Transport for London (TfL) is the strategic transport body for the Capital, planning and managing London's, Underground / Overground, tram, bus and strategic road networks. TfL is undoubtedly (either itself or as part of a Greater London Authority (GLA) 'family' submission) providing evidence on London's transport needs.

Croydon's submission is not intended to repeat evidence provided by the above. Rather its purpose is to add emphasis and provide more detail on one element of transport infrastructure of key importance to Croydon and the wider region and one falling outside of TfL's direct remit, namely the Brighton Main Line (BML).

Major economic and social challenges facing London and its commuter hinterland

Within its evidence, the SLP highlighted the scale of transformation already underway, at Croydon's growth zone/Opportunity Area (focused on the Croydon Metropolitan Centre). Here, upwards of 23,500 new jobs and 8,300 new homes are to be delivered by 2031. The annual Gross Value Added equivalent of these jobs is estimated to be in order of £1.2 billion by 2031.

The SLP's evidence also highlights South London having the highest road-based mode share of any London sub-region, together with some of the slowest journey times. If the growth within Croydon and South London is to be sustainable then (as well as improvement to its strategic road connections), investment in infrastructure providing for alternatives to the car is critical.

Thirdly, the SLP's evidence highlights the scale of population growth forecast for South London with current projections at nearly 240,000 additional people by 2020 rising to over 400,000 by 2031 (equivalent to another Croydon). It contrasts this population growth with the predicted pattern of employment growth. The London Plan forecasts around 800,000 additional jobs but these are mainly located in . The GLA forecasts that South London is set to achieve only 40,000 additional jobs. The SLP emphasises the importance of creating more jobs locally in order to lessen the demands on already strained transport infrastructure.

In summary the major challenge facing London, Croydon and London's commuter hinterland is growth and maintaining or improving access whilst maintaining or improving environmental quality and quality of life.

Growth does not only pose challenges. It also offers opportunities. By providing thousands of new jobs, side by side with new homes and the range of service offered by the Croydon Opportunity Area, Croydon is providing for access with the minimum of travel.

Polycentric growth, such as that at the Croydon Opportunity Area, offers a wider range of benefits. Network Rail's London and South East Market Study

(<http://www.networkrail.co.uk/improvements/planning-policies-and-plans/long-term-planning-process/market-studies/london-and-south-east/>) predicts peak hour passenger demand on

Thameslink and other fast services from Sussex (just some of the Sussex services to Central London on the BML via East Croydon) doubling between 2011 and 2043. This growth is largely predicted to arise from growing population outside of London accessing jobs in central London

Table 1 Peak hour passenger demand projections 2011 – 2043 taken from 'Long Term Planning Process: London and South East Market Study' Network Rail, October 2013

Route	Service group	2011 total	Forecast passengers in 2043	Increase 2011 to 2043
London Bridge	Thameslink & Sussex fast	15,200	27,900 – 31,400	91% – 115%
	Sussex stopping services	9,300	11,700 – 12,900	26% – 39%
Victoria	Sussex routes - fast services	12,100	14,700 – 16,200	22% – 34%
	Sussex routes - stopping services	12,900	16,500 – 18,600	27% – 44%

Network Rail's Sussex Route Study (www.networkrail.co.uk/long-term-planning-process/south-east-route-sussex-area-route-study/) highlights the busiest/most congested parts of the BML as the route from East Croydon to London Bridge and Victoria. By providing thousands of new jobs at the Croydon Opportunity Area, Croydon provides the opportunity for those living between Brighton and London to access jobs without riding on the most congested part of the BML. The growing job market in central Croydon also provides for increased 'counter commuting'. Those living in inner London are able to travel outwards to work in Croydon, greatly increasing the utilisation of the BML infrastructure. It also means that those currently traveling into the Croydon Opportunity Area by tram and bus etc. to interchange to rail for onward travel to work in central London, have the opportunity to work in Croydon and shorten their commute.

What are the strategic options for future investment in large scale transport infrastructure improvements in London

The BML is Croydon's rail spine. It is also Croydon's and London's connection to Gatwick and the wider Coast to Capital Local Enterprise Partnership zone. However, the BML is severely overcrowded, with passengers routinely standing from south of Haywards Heath in the peak. This can only be resolved through running more trains. Current passenger growth is running at least 4%

per annum. If no action is taken, crowding will increasingly extend further south, and occur across a longer part of the day, leading to more instances of passengers being physically unable to board trains.

The BML is also poorly performing, with Public Performance Measure (PPM) plateauing at around 90% for several years, before dropping off due to the London Bridge works. The core reason for the poor performance is the extensive operational interaction between the numerous different train service groups, due to the current complexity of configuration of the rail network. By means of comparison: routes from London Waterloo feature operationally simple grade separated junctions all the way out as far as Woking, whereas there are over a dozen major operational constraints in the Croydon area alone.

The current Thameslink works at London Bridge will provide more cross-London capacity, but this work does not address the key bottleneck on the BML which is in the Croydon area. Hence the full potential benefits of Thameslink are significantly constrained by capacity away from central London. Therefore, only a few additional trains will be possible from 2018 until such a time as this is addressed.

The Croydon bottleneck impacts on service performance across a wide area. From 2018 following completion of the Thameslink works, it will also impact on new routes north of London.

As well as quantifying the problem, Network Rail's Sussex Route Study also lays out the solution. Resolving the bottleneck in Croydon requires additional tracks and platforms in a relatively contained area at East Croydon and grade separation of the London Bridge and Victoria Lines just north at Windmill Bridge Junction. The benefits are very large in comparison with the geographical extent of the project.

In terms of interchanging passenger numbers, East Croydon Station is the fifth busiest in the country (behind Clapham Junction, Waterloo, Victoria, London Bridge) and busier than the recently rebuilt Birmingham New Street and Reading stations. It is also busier than Stratford (London), St.Pancras, King's Cross, Euston, Glasgow Central, Liverpool Street, Manchester Piccadilly and Leeds. In terms of total passenger entries, it is the 17th busiest station in the country. It is busier than the likes of Cannon Street, Edinburgh, Brighton, Gatwick Airport, Glasgow Queen Street, Reading, Marylebone and Liverpool Central stations (ORR Station Usage Estimates 2013/14). However, East Croydon station concourse is severely congested.

New development adjacent to East Croydon and across the Opportunity Area, mean that the station itself is now the "missing piece" in the wholesale transformation of the area. There is an opportunity for a major regenerative station rebuild scheme including railway improvements, housing, offices, retail and improved urban realm. The opportunity exists to upgrade the critical constraints on the BML. However doing this requires land outside the railway corridor in the rapidly developing central Croydon area. There is a major risk that the opportunity could be lost forever if not taken now.

The signalling equipment on the Brighton Main Line requires wholesale renewal in the early 2020s due to it reaching the end of its asset life. It will be far more efficient to upgrade the BML in combination with this signal renewal, rather than as a separate project.

Croydon and the wider SLP share a desire for a “London Overground” type transformation of train services in South London. This is not possible to achieve through management or operator changes. It requires the operationally critical infrastructure constraints in the Croydon area to be removed through a major infrastructure upgrade.

Conclusions

Growth presents both transport challenges and transport opportunities. Growth within the Croydon Opportunity Area means that many of those opportunities can be realised. However for the Croydon Opportunity Area to fully achieve its potential, and for growth in London and the Coast to Capital LEP zone to be sustainable, it is critical that the major bottlenecks on the BML be addressed. In order to ensure efficiency, it is vital that the investment take place at the same time as the planned signal renewal during the next Control Period. It is similarly the right time to complete the regeneration of East Croydon with a new 21st Century station at the same time addition track and platforms are being provided.

Andrew Adonis
Chairman of the National Infrastructure
Commission

Sent via email:
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Commission.gsi.gov.uk

Please reply to : [contact redacted]

E-mail :

Phone :

Your Ref :

Date : 8th January 2016

Dear Andrew,

Thank you for providing Enfield Council the opportunity to respond to the National Infrastructure Commission Call for Evidence on large-scale transport infrastructure improvements in London. We welcome this opportunity to respond on Crossrail 2 and the Council's wider aspirations for local growth linked to the project.

The Council strongly supports Crossrail 2 and believes it will provide the catalyst for transformational change in the Upper Lee Valley, unlocking the potential for thousands of new homes and jobs.

The Council has responded to both the Mayor's consultation and the Crossrail 2 Growth Commission call for evidence. It is understood submissions will inform the identification of further feasibility work needed to ensure plans for local development and the route are aligned.

The Council's response to the consultation questions is set out in the attached submission. Should you require any further clarification as to the Council's response, please contact Joanne Woodward, Head of Strategic Planning and Design on the details above.

Yours sincerely,



Rob Leak
CHIEF EXECUTIVE

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

1.1 Population growth across London and the South East is a major challenge for the area. Enfield's population has grown rapidly in the past decade and presently stands at 324,574 people and 129,000 households making it the fourth most populous borough in London. Projections suggest that by 2032 the population could rise to over 400,000 and the number of households to 169,000 (ONS 2012). This means we need approximately 1,900 new homes per year along with new schools, commercial uses and improved infrastructure, including significant transport investment.

1.2 These pressures for housing growth are not restricted to London and the Council has already received a request from one of its adjoining planning authorities concerning the potential for Enfield to accommodate some of its housing growth thereby increasing the pressure to find a sustainable solution to the need for new housing. More requests are expected as neighbouring authorities review their housing needs and available land supply.

1.3 The scale of the challenge means that a range of sources of supply of suitable land will be needed, including the intensification of existing urban areas and the need to consider land not currently identified for housing growth. Significant improvements to the rail infrastructure offered by Crossrail 2 will help unlock this potential.

1.4 The Council is taking a proactive approach to managing change and delivering growth in the borough. Its flagship regeneration project at Meridian Water is a £2 billion scheme set to deliver up to 8,000+ homes, a range of neighbourhood facilities and over 3,000 new jobs. The Meridian Water project alone will generate a £2.5 billion growth in GDP. Rail investment to the value of £70m which is already in place is a vital component of the infrastructure which supports Meridian Water. Indeed, without this investment, the regeneration of this nature and on this scale could not be taken forward. The Council is keen to work with the Crossrail 2 Commission to explore further the potential for growth in the borough arising from Crossrail 2, which will trigger further increases in housing capacity and associated economic benefits utilising the same principles which underpin the Meridian Water masterplan.

1.5 The West Anglia Routes Strategy Strategic Case submission by the London Stansted Cambridge Consortium (LSCC) (June 2015) states that on current trends the population of the LSCC area as a whole is forecast to grow by well over half a million people in the next fifteen years and another 210,000 jobs are expected - all of this before arrival of Crossrail 2. With GVA growth projected to significantly outpace job growth, the area will be contributing greatly to productivity growth. The Upper Lee Valley Opportunity Area is already a major employment zone, and the London Plan (2015) expects it to accommodate an additional 15,000 jobs, with potential for more if infrastructure

is improved further. Its potential for housing is even greater with the new revised London Plan coming forward in 2016, anticipating a minimum of more than 20,000 new homes, and it could be much higher with Crossrail 2.

1.6 Areas like the Upper Lee Valley have the greatest potential to grow Central London's labour supply, further serving dense and productive employment there as well as supporting employment areas such as Stansted outside of London. The potential for growth in the Upper Lee Valley has previously been recognised in the Mayor's Upper Lee Valley Opportunity Area Planning Framework (OAPF) 2013 and London Plan (2015).

1.7 Research by Oxford Economics, *Investment and Regeneration in the Lea Valley Corridor – Assessing the potential economic impacts for London and the UK* (2012) estimated that the Upper Lee Valley had the potential to generate £3.5bn+ of GDP if enhancements to rail infrastructure to provide four tracking and 8tph are provided along the West Anglia Main Line. Transport improvements already underway will help support growth and regeneration in the short term, but in the longer term these benefits would be substantially greater with a Crossrail 2 service of at least 12tph.

1.8 Tackling the borough's unemployment rate (7% compared to 6.6% for London as a whole) is another important objective for regeneration in Enfield. Building new homes in the borough on the scale needed but which are not connected to employment through rail infrastructure would not deliver our objectives for creating employment; stimulating economic growth and providing social equality. Similarly, the new employment opportunities planned as part of the regeneration of the area will not impact on unemployment in existing communities if transport infrastructure does not connect new employment to existing homes and communities in Enfield and beyond.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

- **How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?**
- **What might their potential impact be on employment, productivity and housing supply in London and the southeast?**

2.1 Given the higher frequency of public transport that the combination of rail enhancement projects will deliver, including Crossrail 2, the North East Enfield Corridor will become a prime location as part of wider connectivity networks in and out of London and the wider Upper Lea Valley and London-Stansted-Cambridge Corridor. Crossrail 2 will support significant numbers of jobs and housing along the line and provide general regional connectivity.

2.2 Enfield's plans for a new gateway station at Meridian Water (to replace Angel Road) mean that there will already be a modern, high quality station serving a major development site. In order to accommodate Crossrail 2, stations at Brimsdown, Enfield Lock and Ponders End will also all be upgraded. This will accommodate higher frequencies, with an additional 12 trains an hour being proposed. This increased capacity will unlock the long term potential of the areas served. The New Southgate area would also increase capacity with up to 15 trains per hour, vastly improving capacity and journey times.

2.3 The provision of a station at Alexandra Palace will also open up direct access to Crossrail 2 for the 13 million passengers (based on 2013/14 figures) in Haringey, Enfield and Hertfordshire who use the stations to the north. The interchange at this station will also relieve crowding at Finsbury Park station, which before wider Thameslink upgrades and development in the local area already has 28 million Underground users, 6 million national rail and a conservative estimate of 1 million interchanges per year. The station will also cover a wide area of north London and offer alternative travel opportunities to those using Piccadilly line services in Enfield, again reducing crowding on existing services and opening up development opportunities currently constrained by network capacity.

2.4 Given the higher frequency of public transport accessibility that the combination of rail enhancement projects will deliver, a number of new local town centres could be developed along the North East Enfield Corridor, focused around the new Crossrail 2 stations and serving both existing and new communities. Indicative masterplanning suggests that commercial and residential uses could be accommodated together creating lively and attractive environments.

2.5 These rail infrastructure improvements would have a significant impact on employment and productivity. Enfield is already one of London's most important business destinations, easily accessible to London's strategic road network and positioned within the London Stansted Cambridge Corridor (LSCC). The relative low cost and availability of commercial floor space and land has helped attract an enviable and diverse industrial base to the borough. Representing the second largest industrial location in the capital, the borough is home to almost 10,000 businesses providing nearly 100,000 jobs. Enfield's employment is expected to grow to 121,000 by 2036. The Council has aspirations to meet the needs of the growing population, working towards a target of 40,000 new jobs between 2010 and 2035, equating to approximately 5% of the forecast job growth for London as a whole.

2.6 Existing growth sectors include low carbon clean tech energy from waste, logistics, warehouse and distribution and professional, scientific and technical. The relative low cost and availability of commercial floor space and land has helped attract an enviable and diverse industrial base to the borough. Maximising employment opportunities for local residents and Londoners whilst accommodating housing growth will be a key challenge for the future and a key priority is to retain jobs and businesses in the borough and help them thrive.

2.7 Although UK and London industrial heritage is in decline as a result of changes to the UK's economic environment, there are a number of viable businesses being priced out of the more expensive areas of London. This creates an opportunity for the borough to promote its capacity to accommodate these businesses with their increased employment offer as part of a wider transformational change agenda.

2.8 Current assessments prepared by the Council's Meridian Water specialist advisors highlight Enfield's ability to provide better equipped and comparably cheaper B1 employment space within easy reach of Central London making it an attractive choice for expanding incubator, accelerator and co-working (IAC) companies. This is in contrast to inner London where there is an increasing lack of flexible and affordable workspace for expanding creative and knowledge-intensive companies.

2.9 Meridian Water is ideally located within the London-Stansted-Cambridge Corridor and can therefore capitalise on sectors associated with this region including life sciences and ICT. The Council has a clear and credible approach to identifying new employment uses which can meet the project aspirations of achieving 3,000 jobs in higher paid sectors. This will see a shift away from the traditional lower density industrial sectors located in the Upper Lee Valley. Meridian Water will bring in employment uses which are capable of paying a salary range from the London Living Wage to a minimum of £70,000.

2.10 The successful realisation of a shift towards higher quality business and residential uses in Meridian Water helps support the case for stopping rail

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services within the area by Crossrail 2. Such services would also form a strong catalyst for the realisation of higher value sectors employing an increasingly higher skilled workforce and benefitting from connections to Central London and the London-Stansted-Cambridge corridor and wider south east region.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

3.1 The Council is already working closely with Transport for London to consider the positive impacts Crossrail 2 might have on promoting housing, improving access to jobs and delivering sustainable places and meaningful regeneration. Utilising the 'Crossrail 2 Strategic Business Case' submission as a basis for future work, the Council suggests that alternative growth scenarios could be modelled to determine the optimum level of benefits from growth that Crossrail 2 could bring. This would benefit from further collaborative working in partnership with the GLA.

3.2 Imaginative use of land in Enfield across the South East, will unlock the potential of areas by maximising housing and employment growth and creating sustainable communities which support both economic and social objectives. However, the realisation of this potential is dependent on rail infrastructure. Crossrail 2 in Enfield could:

- Support the delivery of a significant number of new homes to meet a strong and increasing housing demand;
- Enable the transformation of predominantly low density employment areas into higher density mixed use communities;
- Provide a huge uplift in public transport accessibility, improve access to employment by reducing journey times to key destinations in the Central Area Zone and the LSCC and
- Enable four-tracking of the West Anglia Mainline to increase capacity.

Phased delivery

3.3 The benefits of phased delivery of Crossrail 2 can be realised by Government confirming funding for delivering solutions to level crossings and 4 tracking of the Lea Valley mainline at the earliest opportunity. This phased approach has a number of advantages:

- It demonstrates ongoing commitment, helping to build confidence amongst investors and the public;
- The funding profile is smoothed and therefore more manageable;
- Infrastructure provision is more closely matched with demand with less need for revenue support or excessive crowding; and
- Local skilled workers have ongoing opportunities for employment which avoids de-skilling and labour shortages.

Land use

3.4 There is a need to understand the constraints, opportunities and likely impacts associated with any redistribution of industrial floorspace through the

consolidation, intensification and densification of existing industrial estates in North East Enfield. It is also important to further test the cohabitation opportunities of commercial uses through exploring typologies for new industrial and mixed use employment space. Where market conditions are considered to be appropriate, the constraints, opportunities and likely impacts of alternative locations within the borough for some of the existing industrial floorspace could be also tested.

3.5 This work should include industrial sectoral analysis to review the potential for new sectors such as bio-tech, to form part of future demand for space around key stations in the North East Enfield Corridor. This will need to draw upon analysis sectors such as the life sciences sector for the London Stansted Cambridge Consortium; the Upper Lea Valley low carbon economy; property requirements and locations for the London knowledge economy; and employment land market.

Upper Lee Valley Branch – Eastern Enfield

3.6 At present on the West Anglia Main Line, local stopping services and faster services from Cambridge and Stansted Airport all compete for space on the same line. This limits the number of trains that can call at local stations and extends journey times to and from the area. Liverpool Street and Stratford stations also currently face severe capacity constraints. It is forecast that by 2043 demand for rail travel on this line will have increased by 39% - currently there is no spare capacity for additional services.

3.7 Crossrail 2 provides a solution; it would free up capacity on the West Anglia Main Line helping to reduce journey times for longer distance services and would enable more local services to central London. Transport improvements already underway will help offset the pressure in the short term. But Crossrail 2 is needed to cope with longer term growth.

3.8 Enfield's plans for a new gateway station at Meridian Water (to replace Angel Road) mean that there will already be a modern, high quality station with step free access serving a major development site. Alongside this it is positive that in order to accommodate Crossrail 2, the stations at Brimsdown, Enfield Lock and Ponders End will be upgraded to higher standards, including making them step free. Further discussions will be necessary to agree the details of the upgrades, as well as the possible re-configuration/relocation of some stations to improve passenger access.

3.9 The Council strongly supports increased frequencies at all of these stations, with the additional minimum 12 trains per hour service proposed in the consultation, being a level which will unlock the long term potential of the areas served. It would create capacity for two additional local stopping trains per hour to Stratford and much improved connections to Stansted Airport and Cambridge. Conservative estimates are for Crossrail 2 to unlock 70,000 homes

and 27,000 jobs along the Upper Lee Valley, including at our key regeneration site of Meridian Water together with the wider and longer term opportunities for additional growth in the North East Enfield Corridor.

3.10 It is recognised that level crossings will have to close at Enfield Lock and Brimsdown and alternative solutions assessed to mitigate impacts on east-west transport connectivity, road safety and rail network reliability. The Council, along with stakeholders from along the West Anglia rail route, strongly supports this happening before 2024. However this is on the proviso that mitigation is put in place which improves transport network connectivity, with a particular focus on accommodating bus services and people who choose to walk and cycle, while causing the least disruption to residents in the area around them.

New Southgate Proposals

3.11 The Council welcomes the benefits which Crossrail 2 could deliver in the New Southgate area. The New Southgate proposals will provide up to 15 trains per hour via Seven Sisters; vastly improving capacity and journey opportunities. However this is a drop from 20 trains per hour and the Council would welcome discussion on the rationale behind this. Previously it was the case that 20 trains per hour was the minimum required to make the New Southgate branch viable. Given recent experience, the Council would like to see an early commitment from Network Rail and Transport for London to minimum levels of service, so that these can be factored into our discussions with development partners.

3.12 New Southgate station provides local employment opportunities at the adjacent Crossrail 2 train stabling and maintenance facility, while reduced journey times - only 21 minutes to Victoria - bring 410,000 more jobs within a 45 minute journey. These opportunities will be accessed via step-free stations which have capacity for 2,000 more passengers per day in the morning peak hour.

3.13 Overall the New Southgate branch provides direct access to Crossrail 2 for a large area of north London and unlocks potential for significant regeneration and redevelopment.

Alexandra Palace

3.14 The provision of a station at Alexandra Palace will open up direct access to Crossrail 2 for the 13 million passengers (based on 2013/14 figures) in Haringey, Enfield and Hertfordshire who use stations to the north. By providing an interchange further to the north for suburban rail passengers, there will also be crowding reduction benefits on both the Piccadilly and Victoria Underground lines; one of the core objectives for Crossrail 2.

3.15 Alexandra Palace interchange will also relieve crowding at Finsbury Park station, which before wider Thameslink upgrades and development in the local

*NATIONAL INFRASTRUCTURE COMMISSION – CALL FOR EVIDENCE
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area already has 28 million Underground users, 6 million National Rail and a conservative estimate of 1 million interchanges per year.

3.16 The station at Alexandra Palace will also cover a wide area of north London and offer alternative travel opportunities for those using Piccadilly Line services at Bounds Green and Wood Green, which again reduces crowding on existing services and opens up development opportunities currently constrained by network capacity. The Council's support for the benefits of the Alexandra Palace route alignment and the potential for growth it could have outside of London is shared by local authorities along the route north of London – including Hertfordshire County Council, Stevenage, East Herts, Welwyn and Hatfield Councils. The Council would welcome further discussion led by the Crossrail 2 Commission to debate the route options.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

- **What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?**
- **What innovative funding mechanisms could be considered to support delivery of key schemes?**

4.1 An independent report for Crossrail 2 produced by PricewaterhouseCooper (PwC) (2014) sets out options into how Crossrail 2 could be funded. It shows that over half of the costs of the scheme could be met by London using existing funding mechanisms. Enfield Council supports this and is prepared to play it's part.

4.2 The Council's vision is for phased investment in the transport network in the Upper Lee Valley, which has the following advantages:

- It demonstrates ongoing commitment, helping to build confidence amongst investors and the public;
- The funding profile is smoothed and therefore more manageable;
- Infrastructure provision is more closely matched with demand with less need for revenue support or excessive crowding; and
- Local skilled workers have ongoing opportunities for employment which avoids de-skilling and labour shortages.

4.3 The development at Meridian Water is expected to lever in significant investment into Enfield and unlock the financial potential of the area. The Council will work closely with its partners to support investment and job creation across a number of sectors in Meridian Water, particularly in the Meridian East area. Beyond the use of its planning powers, the Council is looking at opportunities to encourage investment in these areas, reducing regulatory and financial burdens wherever it can, bidding for joint funding wherever appropriate and leveraging in assistance from partner organisations and groups. In order to drive the local economy forward and create jobs for new and existing communities, Meridian Water presents an opportunity to expand on the existing area's assets. There is a significant opportunity to expand, upgrade, regenerate and/ or intensify existing facilities in the area.

4.4 Meridian Water is one of London's Housing Zones. The Housing Zone funding is already providing major station upgrades, including Funding for the upgrade of Meridian Water Station (formerly Angel Road); new road infrastructure and bridges.

*NATIONAL INFRASTRUCTURE COMMISSION – CALL FOR EVIDENCE
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4.5 The Council is driving forward the development of Meridian Water through land purchase and pump priming transport infrastructure, including funding new bus routes. With additional funding streams in order to pump prime infrastructure on a larger scale, and in order to purchase land on the route in advance of development, the local authority would have the ability to capture the land uplift.

4.6 The Council is programming to have its planning framework in place by 2017/18, aligned with the programme for the Mayor's New London Plan and Upper Lee Valley Opportunity Area Planning Framework to capture growth generated through Crossrail 2 in order to exercise its Compulsory Purchase Order (CPO) Powers. Given the optimal timeline to seek parliamentary powers for permission to build and operate Crossrail 2 would be between 2017- 2020, the Council's land assembly strategy would need to commence in 2016 before certainty for Crossrail 2 project delivery is confirmed to assemble land at current use value.

4.7 The Council plans to carry out an early comprehensive assessment of current land values to inform the land assembly strategy, which will then be used to capture increases and recoup some of the uplift. Initial assembly would be through negotiated purchase but given the complex nature of land ownerships in the North East Enfield Corridor, the Council would need to exercise its CPO powers.

4.8 In the process of optimising land use we need to redesign infrastructure to ensure sustainable delivery on the scale required. This is likely to lead to profound changes which will impact on business rates during the period of change as some industrial estates are relocated and others come on stream. We will need a mechanism that can award a 'zonal status' on the areas affected to ensure that the loss of business rates does not impact the process. Transitional support to local authorities would need to be made available to ensure the success of transformation. Consideration also needs to be given to premium revenue streams being identified to offset the CR2 costs.

NATIONAL INFRASTRUCTURE COMMISSION CALL FOR EVIDENCE

RESPONSE FROM THE LONDON BOROUGH OF HACKNEY

1. WHAT ARE THE MAJOR ECONOMIC AND SOCIAL CHALLENGES FACING LONDON AND ITS COMMUTER HINTERLAND OVER THE NEXT TWO OR THREE DECADES?

London's population is rising rapidly, a predicted increase to 10 million people by the early 2030s is now being seen as a conservative estimate. Research by consultancy Atkins, in partnership with Oxford Economics and the Centre for London, claims London's population will actually become home to 12 million people by 2050, surpassing even the GLA estimate of 11.3 million. It also claims that there will be 6.3m workers by 2026 rather than 2050 as currently estimated.

London's overall employment growth is to a large part driven by its role as a leading world class city. The largest density of high value activities associated with this reputation are primarily located within inner London, an area defined as the Central Activities Zone of which Hackney forms a part. This area hosts over 30 per cent of London's jobs.

London's continued economic growth will, alongside demographic factors, drive an increase in population numbers. Current GLA forecasts show Hackney's population alone is predicted to increase by between 100-150,000 between 2011 and 2050.

Unless the supply of housing, new employment space and infrastructure is increased across the capital in line with population growth and the predictions of growth are used to anticipate both the investment and delivery of infrastructure, London's economy will falter.

While rail provides the main backbone of the transport system, London's buses tend to provide local links and with an affordable fare system. However, the streets are increasingly having to cater for higher volumes of pedestrians and cyclists and for servicing and freight logistic requirements as population densities increase.

To cope with the increase in population and economic activity London's current infrastructure must continue to expand to cater for additional demand. From utilities, particularly water and electricity, to Local Government and local public services such as Education, Health and Social Care provision. All will need to receive adequate revenue and capital investment from both public and private sources to keep pace with demand and maintain London's competitiveness.

2 WHAT ARE THE STRATEGIC OPTIONS FOR FUTURE INVESTMENT IN LARGE-SCALE TRANSPORT INFRASTRUCTURE IMPROVEMENTS IN LONDON – ON ROAD, RAIL, AND UNDERGROUND – INCLUDING, BUT NOT LIMITED TO CROSSRAIL 2?

- **How should they be prioritised, taking account of their response to London’s strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?**
- **What might their potential be on employment, productivity and housing supply in London and the SE?**

The Council would suggest that the infrastructure requirements needed are outlined in the Mayor of London’s Infrastructure Plan 2050 and subsequent updates. We would specifically refer to the following as relevant to Hackney:

CROSSRAIL 2

Crossrail 2 is needed to address capacity constraints that will exist on the London Overground and Underground. It will allow up to 270,000 more people to travel into central London during the weekday morning peak period. This scheme is seen as a priority.

The Case for an eastern alignment on the route

However, although Crossrail 2 will improve public transport connectivity to and from Dalston the Council considers that an additional eastern alignment would cater for further growth in Hackney Central and Hackney Wick before heading east to Essex via Newham and Barking & Dagenham.

When this option was first examined we note that the original projections from September 2012 indicated an increase in population of 101,000 and 85,000 additional jobs associated with it.

Significantly since those figures population growth projections for London have been revised upwards with population growths of 30% now forecast in Hackney and Barking alone by 2041 and 50% in Newham for the same period. Thus there will be an expectation of greater population growth along the route on the eastern branch in the order of 330,000 in those 3 Boroughs alone. On job increases these are forecast to rise by 150,000 in Tower Hamlets (mainly around Canara Wharf), 20,000 in Hackney and 70,000 in Newham, again by 2041. This points very much to the idea of the eastern branch having primarily a strong regeneration case and would greatly strengthen the need and business case for the railway.

The LLDC is on target to build 24,000 new homes by 2031 and is already delivering in excess of the London Plan housing target of 1,471 homes per annum. Enhanced connectivity has the potential to increase these figures considerably.

The proposed Crossrail 2 alignments to the northern route have also been promoted as they would relieve overcrowding on both the Victoria and Piccadilly lines. These lines have planned capacity increases of 9% and 60% respectively yet the Crowding Map for 2041 shows little overcrowding on the Piccadilly line north of Manor House.

Proposals for the routing of the eastern branch have indicated two potential alignments towards Stratford. One of these alignments suggests the possibility of an underground Crossrail 2 station at Hackney Wick. The Council commissioned consultants to prepare a report on the feasibility and business case for such a station. The report suggested that the amount of developable land within a 12 minute catchment could deliver associated regeneration benefits in the order of £1.4 billion, well in excess of the benefits necessary to justify a new station.

Accordingly, in any further work on the eastern branch Hackney would seek to have a station at Hackney Wick that would afford a level of relief on the already congested London Overground and also assist in relieving the crowding scenario forecast for 2041. A station in the Hackney Wick area would also unlock growth opportunities in the NW part of the LLDC area which has been identified in their Local Plan to 2031 as having the weakest public transport links.

A future station at Stratford

Currently Crossrail 2 are considering two potential alignments through the Stratford and Olympic Park area for the eastern branch. This consists of a southern alignment with a station at Fish Island and Stratford Regional and northern alignment with a station at Hackney Wick and north of the International Station at Stratford.

The International Quarter at Stratford will accommodate 25000 people. Here East, a new creative and digital hub is expanding to provide jobs in the media, creative and cultural industries. In addition the 2014 Employment Land Review estimates that employment growth in the LDDC area will provide an additional 44,700 to 47,000 jobs by 2031.

Both Hackney and Newham Councils consider the northern alignment to offer the best long term solution for the Queen Elizabeth Olympic Park, Hackney Wick, Stratford City, Stratford Regional Station and the High Speed Kent lines. This would provide a well served national and potentially international high speed, light and heavy rail interchange facility. This option is preferred as it would:

- Link up the International Station with the High Speed Kent services, the DLR and Overground providing relief to Stratford Regional Station and the southern entrance to Westfield Stratford as well as directly serve any forthcoming developments there such as the emerging Stratford City office quarter and the completion of the Olympic & Paralympic Legacy project.
- Relieve the 2041 crowding scenario identified at Stratford Regional on both the Central line and the new Crossrail 1 corridors and would make use of spare capacity on the Jubilee line to serve Canary Wharf.

In addition to locating a Crossrail 2 station north of the CTRL box, the development of a surface station at High Meads loop in close proximity to the International and DLR station would further enhance the hub arrangement. Such a station could allow Lea Valley Line services to utilise the loop at Stratford and provide additional platform capacity for Lea

Valley Line services and provide additional resilience for the Overground when congestion occurs.

Finally a further benefit of developing an additional interchange station at this location would result in higher PTAL levels and a corresponding increase in development values thus freeing areas currently inefficiently devoted to parking.

In order to promote the case for an eastern alignment we have collaborated with the London Boroughs of Newham and Barking & Dagenham, together with Essex County Council to commission a study into a possible eastern option.

Barking & Dagenham have ambitious plans already underway, to position Barking as a place to accelerate the areas growth potential and encouraging inward investment to build new homes and create new jobs. A number of key sites have been identified in and around Barking town centre which have the potential to unlock further growth together with developments further east at Beam Park in close proximity to the C2C line. A direct rail link between Barking town centre and the Stratford rail hub, which an eastern route for Crossrail 2 could provide, is a key infrastructure requirement.

The Study is expected to report in mid-February, and we would be happy to share any recommendations and conclusions from the study.

Continue to improve the London Overground Network

The expansion of the London Overground Network has been a success story with large increases in passenger numbers being accommodated with longer trains. More frequency increases and improvements are planned and the transfer of services to TfL has witnessed a transformation in the quality of the service as well as improvements to stations.

However, further growth in the coming decades will result in severe overcrowding on some sections of the E-W route between Stratford and Highbury & Islington, the line serves Dalston Kingsland, Hackney Central, Homerton and Hackney Wick.

London has seen the benefits of improved interchanges such as the one at Hackney Central/Hackney Downs which has already exceeded its first year target for patronage. The effect of this has, however, put pressure on the existing Hackney Central station which together with Dalston Kingsland, Homerton and Hackney Wick will need complete reconstruction to be able to cope with future increases in demand.

We note that TfL are about to submit plans to provide short term improvements to Hackney Central. Although these are welcome they are barely proposing to keep pace with existing demand let alone future demand.

On the N-S routes, recently taken over by TfL we note that the stations are characterised by poor or outdated infrastructure and we would also wish to see these brought up to standard alongside enhanced services.

Demand for rail travel in east London and north east London along the Lea Valley Corridor is expected to grow heavily in the next decade. Hackney Council is a member of the West

Anglia Routes Group which is working with TfL and Network Rail to seek a commitment to address ongoing constraints arising from having Lea Valley services better suited to a four track mainline currently operating on a two track railway.

Although three tracking is currently planned it is important that further improvements are initiated able to lead to more frequent services along the Liverpool Street to Cambridge corridor.

Continued investment on the Tube network

Whilst we acknowledge that there are no Underground stations in Hackney we nevertheless support continued improvements to the Underground network backed by investment into new rolling stock, signalling and capacity improvements.

We would suggest that the Waterloo & City Line be given priority for investment with walk through trains to enable more passengers to be carried as an early win in advance of Crossrail 2 opening. This line provides a strategic fast connecting link between north and south London. For Hackney this is via the Central Line which serves the area around Liverpool Street and Bethnal Green, both stations close to Hackney's borough boundary.

Improvements to the bus network

Although bus services are of a more local importance we would suggest that their continued improvement is as equally important in social and economic terms. A high quality affordable, reliable and efficient bus network is essential to a prosperous capital city.

Many workers rely on buses to commute at all times of night and day. Buses are also a lifeline for an increasing elderly population who rely on them to improve their mobility.

Buses are also a relatively cheap form of public transport able to swiftly provide new residential or employment areas with improved accessibility levels. Capital investment will be needed for both the bus fleet and bus priority measures to continue to ensure a reliable and efficient bus network has priority on the capital's streets.

Cycling and Walking

We fully support local transport modes and call for Cycling and Walking to be seen as part of the UK's transport national infrastructure programme.

Hackney's Transport Strategy is seeking a cycling modal share of target (for all journeys) of 20% in 2031. A continued investment into key cycling routes, contra-flow cycling measures and safety improvements at key junctions are the type of capital interventions required.

The Council strongly supports walking as an active travel mode and to this end has identified and will continue to identify areas where public realm improvements can bring improvements to promote this mode of travel. A growing population will demand an increasing focus on improving walking and cycling infrastructure within the capital.

3. WHAT OPPORTUNITIES ARE THERE TO INCREASE THE BENEFITS AND REDUCE THE COSTS OF THE PROPOSED CROSSRAIL 2 SCHEME

A significant step has already been taken to increase the benefits by opting for the 'regional' rather than the 'metro' route to maximise access to areas where growth is envisaged.

However, further benefits could be achieved for and by the scheme if the option to unlock the potential additional growth in the east is embraced.

Further analysis is required to define the benefits and quantify the reduction in cost to the scheme and we would support the call for this work to be initiated.

The Council would also suggest that opportunities to enter into joint ventures between public and private organisations be explored. The aim to achieve greater value for the scheme and provide a return on public and private assets in addition to socio-economic outcomes.

4. WHAT ARE THE OPTIONS FOR THE FUNDING, FINANCING AND DELIVERY OF LARGE-SCALE TRANSPORT INFRASTRUCTURE IMPROVEMENTS IN LONDON, INCLUDING CROSSRAIL 2?

- **What is an appropriate local and regional contribution – given the potential distribution of benefits to businesses, residents, transport users and the wider economy – and how could this be achieved?**
- **What innovative funding mechanisms could be considered to support delivery of key schemes?**

As has been stated by London Councils in their submission we acknowledge that London Boroughs will need to contribute to the funding for Crossrail 2 and to this end support proposals for London as a whole to contribute up to half the cost. As the beneficiaries will be residents and businesses it is appropriate that there are contributions from both.

We have looked at the suggestions in the PWC report for a delayed start to the project but feel that the urgency is such that the start needs if anything, to be brought forward.

Residents and businesses outside London who are connected to the route and receive the benefits of Crossrail 2 should also contribute in the same way that London's residents and businesses will contribute.

8 January 2016

Dear Sirs

National Infrastructure Commission – Call for Evidence

The NIC published its call for evidence on 30 October 2015. The Terms of reference cover

1. Future investment in the North's transport Infrastructure
2. London's transport infrastructure
3. Delivering future proof energy infrastructure.

This response from the London Borough of Haringey is in relation to London's Transport Infrastructure.

London Borough of Haringey – context:

Located in North London, Haringey is one of London's 32 London Boroughs. With a population of circa 270,000 the borough has both significant pockets of wealth, and towards the eastern edges with the Lea Valley regional park, some of London's and the Country's most deprived (as measured by the indices of deprivation) communities. Northumberland Park Ward, in North Tottenham is the 2nd most deprived community in London and the 120th most deprived in England out of 7,669.

Haringey is a borough that has been identified for significant housing and employment growth. The further alteration to the London Plan 2015 increased Haringey's annual housing target by 80% (from 832 new homes p.a. to 1502) and the borough has the highest employment growth target (as a percentage) in London. Over the last 3 years, as a result of the changes to government funding, the Council's budget has shrunk by £117m .

Haringey has well advanced plans to support London and the Country's growth requirements. Alongside an adopted and up to date Local Plan, the Council is now engaged in the production of 5 development plan documents, allocating Brownfield sites across the Borough for 20,000 new homes and planning to secure 12,000 new jobs. The adopted Local plan identifies Tottenham and Wood Green as the focus for future growth. Work on Area Action Plans for Tottenham and Wood Green is progressing. Around £1bn of public and private sector investment has been made in Tottenham.

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The Council fully supports the proposals for Crossrail 2 and is working constructively with Transport for London and Network Rail officers to secure effective planning and to ensure that the opportunities to support growth and economic improvement from the new stations and greater accessibility provided by the project can be fully realised. Within Haringey, Crossrail 2 will provide up to 5 new stations, connecting the two principal growth locations of Tottenham and Wood Green to London and the wider south east – including Stansted Airport and Cambridge to the North.

What are the major economic and social challenges facing London and its commuter Hinterland over the next two to three decades?

There is growing evidence that demand for housing in London and the wider south east is impacting upon the economic performance of the region. Affordability and the rising numbers in housing poverty mean that measures to increase the supply of affordable homes for Londoners are now a matter of national importance if the productivity and economic contribution that London (and its boroughs) can make to the country is to be sustained. If growing pressure on the use of land (including the recycling of former employment space for new housing) is not to impact London's capacity to contribute to the country's economic outputs, improving access to work and employment opportunities across economic areas will be of increasing importance. Within Haringey, some 84% of people travel outside of the Borough each day to work. Around 23% of residents work in central London. Public transport use in the Borough is high with almost one third of journeys by public transport. Private car ownership fell between 2001 and 2011 and continues to fall as a percentage of the population. The key transport corridors nevertheless remain air quality management areas as a consequence of unacceptable levels of pollutants derived from road traffic.

The Borough's population has also increased by around 17% between 2001 and 2011 and continues to rise. Over the same period housing stock rose by 11%. Meanwhile, some 3.5 ha of employment land has been recycled for housing.

For Haringey's economically deprived communities, raising household incomes by supporting access to new employment and work opportunities is central to improving not only the health outcomes and the quality of life but also in reducing the costs to the public sector arising from the necessary support to address the consequences of deprivation. Affordable and effective transport options with sufficient capacity to connect these existing and growing communities with the opportunities that London represents one of the key interventions that government can make to reverse the long term decline that these areas have suffered.

The evidence from Crossrail 1 demonstrates also the significant impact upon market and developer confidence that public investment at scale can have. Locations on the Crossrail route have experienced significant increases in development activity in recent years and have made a significant contribution towards meeting London's growing housing and employment land requirements. Within Haringey, the proposed Crossrail2 stations align with the Local Plan's growth locations (and reinforce a planned spatial growth option that underpins the economic performance of key existing areas (such as Wood Green Metropolitan Town Centre) whilst providing an important catalyst for regeneration and renewal in key parts of Tottenham (notably Tottenham Hale and Northumberland Park.

These areas, notwithstanding the Council and GLA investment to date, continue to exhibit challenges – whether in respect of development viability (because of development values and significant costs) or because of investor confidence.

What are the strategic options for future investment in large scale transport infrastructure improvements in London, on road, rail and underground – including but not limited to Crossrail 2?

Haringey Council consider that because of the significant positive impacts that are considered to flow from Crossrail 2, this strategic project should be afforded significant priority within government and the GLA. The Council has received significant positive feedback from the development industry concerning the prospects for delivery arising from the identification of the Crossrail 2 station sites within Haringey. The opportunity that CR2 represents to enable sustainable higher density development in Haringey is unmatched by any other form of strategic transport investment.

Given the significant role that the North Circular Road plays in accessing opportunities in outer London, the current capacity constraints and associated environmental effects that exist on the North Circular road, at locations such as Pinkham Way in Haringey also justify further strategic transport investment by government. North London is poorly served by orbital rail and opportunities for enabling greater movement between outer London Boroughs is constrained by existing network capacity. As London's population grows, and pressure on "affordable" business premises grows in more central sites (where the contrast between residential and commercial (industrial uses) is greatest, the pressure on orbital routes (by road and rail) can be expected to increase. If this growth in outer London trips is to be accommodated further investment is considered appropriate in existing key infrastructure such as the NCR to respond to both environmental as well as localised capacity and safety issues.

Following the successful investment in the Victoria Line and with the advent of the Night Tube, continued investment in underground rail is also a priority. The Piccadilly Line (running thorough the Borough) connects the metropolitan centre of Wood Green and its hinterland with the rest of London. However, investment in new rolling stock, and track/signalling is required to ensure that the capacity of this key corridor can be maximised.

What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

The Council has responded to the consultation on Crossrail 2 to support a single station option at Wood Green in place of the former 2 station strategy. The Council's position is based upon clear economic and strategic reasons but also recognises the financial benefits of this solution. Focusing the regenerative opportunities of Crossrail 2 into the heart of the Metropolitan centre of Wood Green will also, in the Council's view, maximise the benefits that can be realised from the investment proposed.

Haringey Council also considers that the long delivery times associated with Crossrail 2 means that TfL should fully explore the use of all of the land identified for both construction and delivery of the project. This includes developing a strategy to enable

positive “meanwhile use” of worksites and safeguarded land and to work with boroughs on long term solutions for worksite and over station development opportunities post implementation.

What are the options for funding, financing and delivery of large scale transport infrastructure improvements in London, including Crossrail 2?

The delivery of large scale transport infrastructure in London benefits the whole of London and the wider south east. The evidence that the Borough is presented with from developers seeking to bring forward new development in the Borough is that infrastructure costs play an important part in the delivery of new development – and directly impacts upon the achievement of important affordable housing and employment space outcomes through mixed use developments – particularly in more marginal areas of the Borough (which are in need of the investment most). Given the very broad spread of benefits from such infrastructure, the costs of delivery should be appropriately shared – and certainly should not land disproportionately on specific boroughs. Investment in rail infrastructure is of benefit not only to rail users and those located in the immediate vicinity, but also to those businesses and residents located some distance from stations. Funding for Crossrail under the existing CIL, represents a simple and transparent means by which contributions can be made towards delivery. The “infrastructure” for administration and delivery is also well established and understood. The Council would urge the commission to carefully consider the implications for any other funding regime that might be considered – and balance the costs of collection and enforcement against any potential benefit.

How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

The Council has no specific insight or views on what transferrable lessons might be derived from a study of other transport infrastructure projects. It nevertheless notes that public sector investment in strategic transport is central to unlocking growth in mature and growing cities across Europe and considers this investment to be a key part of the role of government in promoting sustainable development in line with the NPPF.

National Infrastructure Commission Evidence on Infrastructure Improvements in London

London Borough of Waltham Forest Proposal for a Crossrail 2 Line

Waltham Forest Council supports in principle introducing major new public transport infrastructure to accommodate an increase in London's population from 8.6 million today to a predicted 10 million by 2030. The Crossrail 2 scheme on its safeguarded alignment would provide significant additional public transport capacity to the north east sub region of London. The current proposals for connections towards Broxbourne and New Southgate would facilitate development in the boroughs of Hackney, Haringey and Enfield. However, the current safeguarded scheme does not connect eastwards to Waltham Forest, meaning that the borough will derive limited benefit from the scheme.

The current scheme does indicate the possibility of a future eastern spur but no information on the alignment of this is currently indicated. Waltham Forest Council considers that an eastern spur should be an essential element of the Crossrail 2 scheme from the outset. The Council would welcome the opportunity to explore the detailed alignment of this spur with stakeholders and delivery partners to ensure the borough has sufficient transport infrastructure in place to accommodate continued economic and housing growth.

In terms of the strategic role of Crossrail 2, the Council supports the key objective of accommodating housing growth and regeneration and also considers that the scheme has an important function in terms of relieving congestion on existing underground and suburban rail network. A scheme introduced on the safeguarded route would substantially reduce overcrowding on the Piccadilly and Victoria lines and on the West Anglia rail routes to East Hertfordshire and West Essex.

A potential eastern spur of Crossrail 2 would perform a similar dual function: regeneration and congestion relief. An eastern branch would help relieve congestion on the Central line which would otherwise be expected to become critical all the way from central London to Leytonstone. Latest Transport for London modelling suggests that between four and five passengers per square metre will be forced to stand by 2041 from Leytonstone with existing committed schemes in place.

With regard to the relocation of certain types of land use, such as employment land and open space, Waltham Forest Council seeks to retain these where possible, particularly employment land as this is in short supply in the borough. However, we recognise that there is a case for redesignation of land for housing-led development around public transport nodes where it is possible to implement high density residential development, in turn contributing to the cost of delivering transport infrastructure improvements. The Council has identified a number of such opportunities and is already delivering significant housing growth through the delivery of GLA Housing Zones in the west of the borough.

Work carried out for the development of TfL's North London Sub Regional Transport Plan shows that Waltham Forest has seen a higher population growth in recent years than neighbouring areas. Indeed, research carried out by the Council indicates that the actual population in the southern part of Waltham Forest is considerably higher than that indicated

by the census. This population growth is expected to continue over the next 20 years as the borough is both a desirable place to live and, relative to inner London, provides a greater range of accommodation that is more reasonably priced.

The borough has an ambitious target to deliver 12,000 new homes in the next five years, the majority these being in the southern half of the borough (the area that would benefit from a connection to Crossrail 2) with further growth planned for the following decades. There is scope for several thousand new homes in the Leyton area on a number of major development sites such as Leyton Mills Retail Park, along Orient Way and a possible scheme to deck over the A12 at Leyton/Leytonstone Central Line Stations which is being developed by Transport for London.

In recent years, Waltham Forest Council has worked with a range of strategic stakeholders and delivery partners to secure significant investment for the development and infrastructure at Queen Elizabeth Olympic Park which sits to the south of the borough; on the business case and delivery plan for Lea Bridge Station which will open in May 2016; and the introduction of network improvements and investment in transport infrastructure across east London's Overground network. On the basis of this track-record, the Council is extremely keen to work with partners to develop plans for an eastern spur of Crossrail 2 that facilitates further growth and capacity improvements in the borough and the east London sub-region as a whole.

National Infrastructure Commission Call for Evidence

Submission from London Chamber of Commerce and Industry

8th January 2016

Introduction

London Chamber of Commerce and Industry (LCCI) has been a voice of London business for over 130 years. We are the largest capital-focused business advocacy organisation, representing the interests of over 3,000 companies from small and medium-sized enterprises through to large, multi-national corporates. Our member companies operate within a wide range of sectors across all 33 London local authority areas – genuinely reflecting the broad spectrum of London business opinion.

As the voice of London business we seek to promote and enhance the interests of the capital's business community through representations to the Mayor and the GLA, central Government, Parliament and the media, as well as relevant international audiences. Through member surveys and commissioning research, LCCI seeks to inform and shape the debate on key business issues.

This submission focusses on the National Infrastructure Commission's second challenge – large-scale transport infrastructure improvements in London, as outlined in its terms of reference.

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

LCCI believes that London faces two significant challenges. The first is the acute undersupply of housing in the capital. The second is the need for sustained investment in London's transport system, in order to service London's rapidly increasing population.¹

Research undertaken by ComRes on behalf of LCCI in May 2015 found that housing was the top infrastructure priority for London.² It is, consequently, essential that the role of investment in London's transport infrastructure to help address London's chronic undersupply of housing is recognised.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

LCCI strongly supports the development and construction of Crossrail 2. It represents a strategic investment in London's future infrastructure needs. The successful delivery of Crossrail 2 would help address the two pressing issues; London's housing crisis and transport 'capacity crunch' which are both impacted by the capital's increasing population and levels of employment.

¹ It is expected that the population will grow to 10 million by 2030 (<https://tfl.gov.uk/info-for/media/press-releases/2015/june/-tfl-annual-report-published>)

² ComRes survey of 1,016 members of the London public, 156 London councilors and 510 London business decision makers for London Tomorrow *London's future infrastructure: Who pays and how do we deliver?* May 2015

By improving transport connectivity across the capital, Crossrail 2 has the potential to unlock the development of tens of thousands of new homes, particularly in the Upper Lee Valley and even the Stanstead Corridor, and LCCI believes that the project should be viewed as an essential component of overall efforts to reach housing targets.

Concurrently, with the rapid increase in London's population (expected to reach 9 million by 2020 and 10 million by 2030) it is also essential that London increases its overall transport capacity to accommodate the increase in the number of commuters into and through the capital.

LCCI recognises, however, that there are other, smaller scale infrastructure projects in London that need to be taken forward. The wider South East of London is experiencing rapid population growth and the regeneration of East London has seen increased investment by the business community. However, road connectivity in the area is poor, especially in comparison to West London. Within the M25 there are 23 fixed road crossings across the River Thames west of Tower Bridge (not including Tower Bridge itself)³ but just two to the east.⁴ This is detrimental for businesses in East London who are disadvantaged in comparison to their competitors on the other side of the capital. Whilst LCCI supports the current proposals for the Silverton Tunnel, we believe that new, fixed river crossings should also be constructed at Gallions Reach and Belvedere.

Finally, tube upgrades are especially needed on the Piccadilly and Bakerloo lines, together carrying over 800,000 passengers a day, where rolling stock is over 40 years old. 42% of London business decision makers see Bakerloo and Piccadilly line upgrades as very important.⁵

- **How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?**

Crossrail 2 has the potential to deliver new rail capacity and also maximise London's potential for business and residential development. Any infrastructure project needs to tackle these two interrelated issues in order that London can remain competitive and productive as its population grows.

LCCI believes that Crossrail 2 is vital to London's future. However, new river crossings in the East and improvements to existing infrastructure are also hugely important and will need to be delivered.

- **What might their potential impact be on employment, productivity and housing supply in London and the southeast?**

³ East of Tower Bridge but east of M25 crossing of River Thames at Egham, there are the following fixed road crossings of the River Thames: A308 (at Staines), M3 (at Chertsey), B375 (at Chertsey), A244 (at Walton), A309 (at Hampton Court), A308 (at Kingston), A505 (at Richmond), A316 (at Richmond), South Circular Road (at Kew), A316 (at Mortlake), A306 (at Hammersmith), A219 (at Putney), A217 (at Wandsworth), A3220 (at Battersea), A3031 (Albert Bridge), A3216 (Chelsea Bridge), A202 (Vauxhall Bridge), A3203 (Lambeth Bridge), A302 (Westminster Bridge), A301 (Waterloo Bridge), A201 (Blackfriars Bridge), A300 (Southwark Bridge) and A3 (London Bridge).

⁴ West of Tower Bridge but east of Queen Elizabeth II Bridge/M25 crossing of River Thames at Dartford, there are the following fixed road crossings of the River Thames: A101 (Rotherhithe Tunnel), A102 (Blackwall Tunnel). In addition to the above fixed road crossings, there is also the Woolwich Ferry.

⁵ ComRes interviewed 506 London business decision makers between 19th May and 11th June 2014

Crossrail 2 is a transport project that can help unlock London's housing potential. It has the potential to enable and accelerate the development of 200,000 new homes across the region.⁶ The project would deliver jobs to the area by releasing and adding to capacity on longer distance main lines. It can also improve productivity by bringing a greater number of individuals' journey times below 45 minutes.

The population in London will continue to grow, regardless of whether Crossrail 2 is built. This is why it is essential for the issues of transport congestion and housing undersupply to be addressed now. Slow, congested commutes affect productivity and make it harder for businesses to recruit and retain staff. This is why both new homes, but also increased transport capacity across the London network, are required.

New river crossing to the east would also be particularly beneficial for the business community, especially the freight industry and those businesses who rely heavily on freight deliveries for their operation.⁷

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Highlighting the link between Crossrail 2's benefit as a means to deliver more homes, as well as increased transport capacity, is important. Publicising the project as a piece of vital housing infrastructure can help ensure that routes and station plans are developed mindful of the potential for land development, whether that be for office or residential use.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

The economic benefits of Crossrail 2 reach far beyond London and the South East alone. It is a vital piece of national infrastructure that will benefit the UK as a whole. For example, central government will benefit from Crossrail 2 through the increased tax receipts that will result from the economic growth it generates and the new homes built. Contributing to the project is therefore a good investment from the Exchequer's perspective.

Given the direct benefits to London, including its business community, the project will undoubtedly require contributions from the businesses and communities in London that stand to benefit. We would look towards Crossrail as an example which could be followed and consideration should be given to a Business Rate Supplement.

Beyond this we believe devolution has a role to play in helping deliver Crossrail 2. Increasing the proportion of the tax revenue generated by London that is retained by the capital would help allow it to pay for its own infrastructure needs. Moreover, further devolution might be tied to specific infrastructure projects such as Crossrail 2, whereby some of the value created by the project (e.g. increased stamp duty receipts from homes built in unlocked developments) helps pay for the initial investment.

- **What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?**

⁶ Crossrail 2: regional and national benefits September 2015

⁷ Around 90% of goods are moved around London by road (<https://tfl.gov.uk/info-for/media/news-articles/road-modernisation-reaches-half-way-point>)

As suggested above, the NIC should look at those who will benefit from the scheme in order to decide from where the financing should come. Given the relative lack of fiscal autonomy in London, the NIC should evaluate the benefits of creating a funding mechanism tied to devolved revenue streams such as business rates and stamp duty in order to allow the capital to fund its own infrastructure projects.

- **What innovative funding mechanisms could be considered to support delivery of key schemes?**

As highlighted previously, stamp duty could be devolved to London and linked to specific infrastructure projects in order that funding can be drawn from those who will most directly benefit from the investment in the longer term.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

Cities such as New York and Hong Kong retain a significantly higher proportion of the revenue they raise than London. Currently the Mayor of London retains just 7% of tax raised in the city. In New York the figure is 50%, in Tokyo it is 70%. Consequently, they are able to look strategically at their own, unique infrastructure needs and address them accordingly.

London does not need to reach these levels - but it does need a greater level of tax retention and greater autonomy to tackle the challenges it faces.

For further information please contact:

[contact redacted]

► National Infrastructure Commission

► Call for evidence: London's transport infrastructure

London Councils represents London's 32 borough councils and the City of London. It is a cross-party organisation that works on behalf of all of its member authorities regardless of political persuasion.

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

London's population alone is forecast to increase to 10 million people by 2030 with significant population growth expected in the wider south east of England as well. This provides a major opportunity for national growth, job creation and GVA but has a consequence for all London's infrastructure, including its transport system. In recent polling commissioned by London Councils, Londoners named housing, health and schools as their top three infrastructure priorities, as well as strong support for investment in the 'unseen' infrastructure that is vital to the city's functioning – waste, energy, digital and flood defences.

London Councils' polling indicates that 88% of Londoners believe there is a housing crisis. Unprompted, 54% give housing as the most important issue facing London. Major house building is needed, and these homes need good transport links otherwise they become unconnected deserts where people are forced to rely on car ownership. This is not something London wants to promote.

Positive contributions to these challenges could include a shift to a circular economy and investment in digital infrastructure to enable more people to work from home or use internet-based conferencing facilities, reducing usage of the transport system in peak periods. However, relying on digital infrastructure alone will not meet London's growth challenges and so significant investment in transport infrastructure is required. London government and central government need to tackle these challenges boldly, and not tinker at the edges; London's transport system is already at capacity, which can only worsen with increased population and employment growth.

London's economy relies on a mix of professions and workers at different income points. Without the right mix of homes across London to accommodate them, London's transport infrastructure will come under increasing pressure as lower-paid workers have to commute longer distances to centres of employment. This is why councils need the right local planning tools and flexibilities to ensure the right mix of tenures for their areas. Therefore the government should look again at policies such as Permitted Development Rights and Starter Homes which have the potential to undermine this local discretion, with consequences for housing mix and infrastructure.

London needs to get a good balance between land for employment and housing. Land for employment is coming under increasing pressure in the capital because of rising rents in some parts, the Permitted Development Rights policy and viability issues. Developments around infrastructure should incorporate mixed uses, whenever appropriate, and ensure that any businesses displaced by large infrastructure are appropriately relocated. Population growth needs to be matched by significant local growth in employment; otherwise most new job opportunities will be concentrated in central London and create even greater pressure on already constrained radial transport routes. Job creation in metropolitan centres in outer London can help reduce the need for radial trips to central London.

Housing Zones – which we have welcomed – are a good demonstration of how a locally-led and multi-agency approach can ensure the right infrastructure to unlock new housing supply. The Southall Housing Zone is a good example of a partnership between City Hall and the borough and other agencies to deliver a coordinated approach to housing and infrastructure.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London – on road, rail and underground – including, but not limited to, Crossrail 2?

- How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?
- What might their potential impact be on employment, productivity and housing supply in London and the southeast?

London Councils believe that there are a number of strategic transport infrastructure schemes that London needs, but Crossrail 2 is the most significant and strategic of these.

Crossrail 2

Crossrail 2 is desperately needed to address severe capacity constraints that will exist on the London Underground and mainline Network Rail services such as those into London Waterloo, London Liverpool Street and London Victoria. When High Speed 2 is complete, Crossrail 2 is needed to provide capacity to allow those passengers to transit easily through London Euston. Crossrail 2 will support significant numbers of jobs along the line and provides general regional connectivity, which at present is only offered by the Thameslink line. Crossrail will improve this but more rail lines which negate the need to use the tube will have wider benefits for the rail and tube network in London as a whole. Crossrail 2 presents an opportunity to unlock sites for a significant number of homes that London desperately needs, and this should be taken into consideration in funding the scheme. There are also strong calls for an extension to east London to bring regeneration benefits to the London Riverside and Thames Gateway area.

Improve orbital routes in outer London and provide new rail connections

At present rail and road infrastructure is focused on getting people in and out of central London. In the outer London boroughs, a reasonable proportion of residents commute to work in another outer borough. Town centres in outer London such as Kingston, Sutton, Croydon, Bromley could benefit from improved orbital rail, bus and tram links between these areas, which would improve the current situation of people having to travel into central London to change and then travel out again, as well as reducing congestion. The Tramlink in south London has demonstrated the opportunity to build this capacity as have orbital 'express' bus services such as the X26 service which links Croydon and Sutton with Heathrow Airport. As well as the connectivity benefits, these services are often more affordable and easier to introduce than equivalent journeys by rail or tube. In areas of major regeneration and growth opportunity, key transport links such as the A13 trunk road need to be invested in to support this growth.

Brighton Mainline Upgrade

The Brighton Mainline which connects Brighton with central London via East Croydon and Clapham Junction is already severely overcrowded with passenger growth increasing at 4 per cent each year. As well as providing a commuter route, the line serves Gatwick Airport, and carries the Thameslink Service to London Bridge for onward travel to Blackfriars, St Pancras International and various destinations north of London. The last remaining serious bottleneck on the Brighton Mainline is caused by track arrangements at East Croydon station and north to the Windmill Bridge Junction due to the number of points and crossovers. This leads to trains frequently having to wait whilst another crosses its path, and other delays. Network Rail has carried out an Area Route Study and identified the urgent need to straighten the tracks, remove all crossovers and provide additional track through East Croydon station and north of it, and to grade separate the rail lines to London Victoria and those to London Bridge at the Windmill Bridge Junction. Network Rail is convinced of the need to deliver the improvements in Control

Period 6 (2019-2024), together with a rebuilt station at East Croydon that meets Croydon's modern needs. East Croydon is the fifth busiest interchange in the country and one of the busiest in terms of passenger entries and exits. Network Rail's proposals include two additional platforms and a greatly extended passenger concourse at the station to seek to cater for passenger demand / numbers. Croydon Council considers the improvements at East Croydon and up to and through Windmill Bridge Junction, vital to the achieving the growth potential of the Croydon Opportunity Area and meeting the growth needs of London and the South East.

Upgrade and extension of the Bakerloo line

This will support growth in southeast London and improve access to public transport, reducing car usage and associated emissions and congestion. The extension will support regeneration and development schemes, improve journey times and provide better connections, improving capacity.

East London River Crossings

We strongly support the feasibility work TfL is undertaking to explore river crossings in the east of London. More crossings in this part of London are much needed and would significantly improve connections between areas to the north and south of the river, supporting jobs and business growth. Whilst road crossings are important to improve the resilience of the south east London road network, we believe they must incorporate safe and viable walking and cycling crossing options. Bus routes should also be scheduled to use the crossings and we support TfL in exploring the inclusion of public transport options such as trams or the DLR.

An improved bus network

In recent polling commissioned by London Councils, more frequent buses were the top improvement Londoners wanted to see; selected by 48% of those surveyed. This rose to 63% amongst people with lower incomes. Boroughs want to see a more responsive bus network, with new routes created to serve new housing developments and employment sites, where public transport options can at present be limited. Good public transport links improve the desirability of a new development and reduce car ownership if people know they will be able to get around, as well as contributing to improved air quality. The creation of bus lanes is important in improving the reliability of public transport. Bus services that link outer boroughs with central London to reduce the cost of travel for low-paid Londoners was also something that our recent research into transport affordability *Living on the Edge* uncovered.¹

Improvements to cycling and walking infrastructure

Notwithstanding the recent developments on a national walking and cycling investment strategy, it remains important in London to continue to provide the hard cycling and walking infrastructure that makes using these modes safer in London, as this is so often cited as a barrier. The recent mini-Holland schemes should be tested for success and could be rolled out to other parts of London.

Electrification of vehicles

Increasing the uptake of electric vehicles in commercial fleets and household vehicles is predicated on having sufficient charging infrastructure to give people the confidence to switch to a hybrid or fully electric vehicle. As well as citywide charging infrastructure, there must also be sufficient electricity capacity to charge these vehicles.

We believe that schemes should be prioritised that will unlock housing numbers and growth in jobs and businesses. Transport schemes are not ends in themselves, but are a vital part of the wider infrastructure the city needs to provide for its residents and businesses. Public realm can also contribute to the success of infrastructure projects, and opportunities to regenerate local areas, where appropriate, should be part of schemes. It is important to remember that schemes such as the Jubilee line have unlocked areas of London for growth and regeneration. Schemes such as these, that are ambitious for London, should continue to be considered.

¹ <http://www.londoncouncils.gov.uk/our-key-themes/transport/rail-and-tube>

We have outlined above the strategic infrastructure that London needs to support its growth. It is also important that the non-glamorous infrastructure needs, such as well-maintained roads and good signposting and public safety to encourage people to walk more, are also important to keep London moving. Improving step-free access onto transport must also continue to be a priority.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

TfL has already undertaken a lot of work to increase the benefits, not least by opting for the 'regional' route rather than the 'metro' route and by working with boroughs and local authorities along the route to develop plans for housing and regeneration. The regional route brings greater benefits to London as a whole and to outside London than the metro route. The balance has to be struck between providing a fast, reliable journey time, and increasing connectivity for a large number of communities along the line.

London Councils also believes that the traditional cost: benefit ratio using the WebTag business case methodology fails to fully capture the wider economic benefits that transport infrastructure can create in unlocking development sites. We want to see the government take Gross Value Added into account in its assessment of the value of new schemes.

The only options we consider that can reduce the overall cost are to:

- Shorten the route, which would reduce the benefits analysis;
- Reduce the number of stations the railway calls at, reducing connectivity, house building potential and benefits to residents and businesses at that location. For Crossrail 2, all but one of the proposed stations in the tunnelled section are interchanges with other lines, and relieving capacity on other lines is one of the main purposes of Crossrail 2.
- Phase the construction of the railway over a much longer time period, which could mean a lengthy construction project with a great deal of uncertainty and extensive disruption to residents and businesses. Phasing the project also risks not delivering the capacity benefits that London needs at the time when it needs them most (for example missing the opening of High Speed 2 at London Euston and the significant capacity constraints that will create without Crossrail 2).

Whilst we support efforts to reduce costs, we would need to understand the consequences of any of the options listed above more fully before we could support them.

Crossrail 2 needs to be viewed in the context of the significant housing benefits it offers, which should be maximised and are absolutely essential for London to prosper in the future. The links between London prospering and benefits to the rest of the country have been well documented. Stronger transport links can make a site more attractive to developers, increasing the number of housing units supplied. Unlocking sites for development in this way helps people to get to work more quickly and increases the attractiveness of an area for workers.

It will also be important to consider fully the interdependences between Crossrail 2 and other infrastructure that will ensure the benefits of Crossrail 2 are fully realised. Other infrastructure enhancements will improve the areas stations serve; free up physical space for the construction work to take place; and ensure that additional capacity provided by Crossrail 2 is not lost by bottlenecks on another piece of transport infrastructure such as the tube or rail network.

We also note that there are no real alternatives for London Waterloo without Crossrail 2. Even were the South West Mainline six-tracked, without Crossrail 2 the constraints would remain. One alternative is a fifth track all the way into Waterloo, although we understand that Network Rail considers this difficult and expensive. At the northern end of the Crossrail 2 route, four-tracking of the West Anglia line from Cambridge into the Lea Valley could potentially allow more trains into Stratford, though not on to London Liverpool Street. These upgrades would not support the full growth potential of the Upper Lea Valley.

At London Euston, costs could be reduced by planning for the comprehensive redevelopment of Euston station to incorporate the existing mainline station, the High Speed 2 station, and the Euston St Pancras Crossrail 2 station. By bringing forward the redevelopment of the mainline station, the costs of purchasing residential and commercial property, providing compensation, and the impact on those affected can be reduced; worksites could be shared; and a better station experience created.

4. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

- **What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?**
- **What innovative funding mechanisms could be considered to support delivery of key schemes?**

When polled, 79% of Londoners said central government should fund infrastructure, rising to 83% of 35-54 year olds and those with lower incomes.

Nevertheless, London boroughs support the proposals for London as a city to contribute half of the cost of Crossrail 2. As the beneficiaries will be residents and workers, it is appropriate that there are contributions from both. We continue to support a pan-London funding package, as exists for Crossrail.

London boroughs support the continuation of the Business Rates Supplement at 2 per cent for businesses with a rateable value of over £55,000, whilst acknowledging that this is a blunt instrument and can lead to discrepancies between businesses that pay and business that benefit. We consider there is scope for considering how businesses around Crossrail 2 stations could contribute where they would not be eligible to pay a Business Rates Supplement, striking a balance to protect small businesses. There is also broad support for the continuation of the Olympic council tax precept at its current level to fund infrastructure, although clearly this was not its long-term intended purpose.

London Councils has considered international examples of funding infrastructure but at present there is not the interest from London boroughs to pursue these further. Some central London boroughs have explored a visitor levy or hotel tax, but consider it more appropriate to raise this to fund services that directly improve the borough for tourists – such as street cleansing and public realm improvements.

We strongly believe that residents and businesses outside London who will receive the benefits of Crossrail 2 must also contribute in the same ways that London's residents and businesses are contributing – through a Council Tax precept and Business Rates Supplement. The Mayor does not have any authority outside London, but we would hope that the counties of Hertfordshire and Surrey could come voluntarily to an agreement with London to establish such funding mechanisms. This has been achieved before with the funding of the Lee Valley Regional Park.

We also note that TfL is exploring the contribution stamp duty from the sale of new homes and increased prices on the sale of existing homes could make to Crossrail 2. We believe this should be further investigated for its merit in funding Crossrail 2.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

PwC's Funding and Financing Study explores in depth international models for funding infrastructure, which we have considered for their applicability to London.

Toronto, Canada, is responding to its city congestion problems with a two-stage investment in its transport system, focusing on bringing economic growth and job creation. It will build, extend and upgrade a series of light rail, underground and bus routes over a 25 year period.

Paris is establishing an equivalent authority to the Greater London Authority to improve its city transport connectivity with its suburbs. It is building a Grand Paris Express to link the centre of Paris with its airports and major economic areas in the greater Paris region.

Nottingham City Council has introduced a workplace parking levy on its employers which want to provide parking, to tackle traffic congestion, fund extensions to the tram system and fund their local bus network.

London Cycling Campaign is the capital's leading cycling organisation with more than 12,000 members and 40,000 supporters. We welcome the opportunity to submit comments to the National Infrastructure Commission. While the comments below relate to London most have relevance for the rest of the United Kingdom.

3.1

In line with the published terms of reference, the Commission is reviewing the evidence base and the strategic options for future investment in large-scale transport infrastructure improvements in London.

The questions that the Commission is particularly keen to focus on in this initial phase of work are:

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

London's population is growing and expected to exceed 10m. Motor traffic congestion is already a problem in the capital and it will get worse if car ownership and use increases. Public transport also suffers from capacity problems. Maintaining, and increasing, the pace of cycling growth is vital to keep London moving.

London's Mayor has a target in the TfL business plan of doubling cycling's modal share to 1.5 million journeys by 2026 (a 5% share at current population levels). If this target is not achieved there will be the much more costly challenge of getting London's increased population to its various destinations by other means. Cycling infrastructure is significantly less expensive than new road, rail or underground tunnels (and can be minimal if incorporated into road modernisation programmes) yet it offers very efficient use of road space: the newly built East-West cycle superhighway will have the capacity for 1000 cyclists per hour each way – the equivalent of four underground trains.

The number of daily cycling journeys in London already exceeds the total number of journeys on the Docklands Light Railway, London Overground and Tramlink put together. Surveys carried out for TfL indicate that a quarter or more of Londoners would like to cycle or cycle more often. The aspirational target set by TfL and the Mayor of 10% of journeys is achievable and is still well below the existing rates in Amsterdam (36%) and Copenhagen (45%). According to TfL data, in Central London at peak times cycles already account for a quarter of vehicles on the road.

In the context of this inquiry it is worth noting that in the Netherlands 40% of journeys to stations are made by bicycle. This is facilitated by ample cycle parking at stations as well as safe cycling routes to those stations. In the UK cycling accounts for 2% of journeys to stations but that can rise rapidly (e.g. Cambridge) if facilities are provided (a new 3000 space cycle park is being constructed) .

No major road or rail infrastructure programme must be allowed to proceed without consideration of cycle access and parking: Parliamentary approval of the outline plans for St Pancras rail terminus without any requirement for cycle parking or access resulted in a significant barrier to integrated transport use at this flagship location which the local authority was unable to undo.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

- **How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?**
- **What might their potential impact be on employment, productivity and housing supply in London and the southeast?**

Sustainability, improved air quality, improved health and efficiency and a better quality of life for Londoners must determine the transport priorities for London. Increased cycling levels address all of these issues and the well documented examples from the Netherlands and Denmark show how cycling can become the primary transport mode in a dense urban environment (see below for data) .

Prioritisation of walking , cycling and public transport enables cities to build more homes and allocate less scarce space to car parks and street car parking. A recent report (Minor Alterations to the London Plan) on the proposed minor increase in car parking levels in outer London shows that even this minor change may cost 260 fewer homes for Londoners each year.

Provision of high grade cycle facilities across the capital, and particularly in its major town centres, would enable more people to travel to work , education and leisure destinations more quickly and with health benefits to themselves.

Designing all transport interchanges to permit multi-modal transport can extend the 'active travel' catchment areas of stations fourfold reducing the need for car travel to stations and car parking at stations.

Dutch, and British, academic studies show that cyclists live longer, have higher fitness levels and show lower levels of absenteeism than people who have to choose other travel modes.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

LCC submitted the following comments to the preliminary Crossrail 2 consultation

The following are our general concerns regarding the potential benefits to and impacts on cycling, arising from Crossrail 2.

1. Crossrail 2 rolling stock design should ensure maximum possible capacity for cycling carriage. Many of the stations proposed are in areas with attractive leisure cycling potential, and a higher proportion of cycle carriage spaces would enable cyclists to more easily travel to and from central London outside of peak hours with their bicycles, access Crossrail 2 stations for leisure purposes and travel through London using Crossrail 2.
2. In Holland, around 40 percent of train passengers use bicycles to get to and from their local "home" train station. TfL has an opportunity to easily increase cycling

modal share in London, by ensuring Crossrail 2 stations feature exemplary, international levels and quality of cycle parking – built to anticipate future demand, rather than service current demand.

3. In a similar vein, it's also vital local councils involved and TfL give appropriate consideration to safe space for cycling on routes from surrounding residential areas and other suitable locations to access each station. In central London, the project offers significant opportunities to improve nearby main roads and routes lacking in appropriate cycling infrastructure.
4. Finally, such a large construction project will carry its own issues – in terms of HGV/lorry movements, construction sites and temporary site works. It's obviously important that everything that can be done to mitigate disruption and increased risks to cyclists from such issues is considered. We call on TfL to specify “direct vision” lorries for all Crossrail 2 construction (as well as ensuring operators are CLOCS compliant etc.), and to work with London Cycling Campaign and relevant local borough groups on a regular basis to ensure safety is maximised and disruption is minimised throughout the construction period.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

- **What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?**
- **What innovative funding mechanisms could be considered to support delivery of key schemes?**

In Dutch and Danish road schemes provision for cycling is integrated into projects from the start rather than tagged on as an, often expensive and disruptive, after measure. They also consistently adhere to well established and progressive cycle infrastructure design standards (the Dutch CROW Design Manual for Bicycle Traffic and the Danish Collection of Cycling Concepts are both translated into English) . London has recently published cycling design standards (London Cycle Design Standards and the accompanying Cycling Level of Service assessment) which include continental good practice, but these are not yet used consistently. The current UK cycle design standards lag behind the London ones and even they are not followed.

The Dutch and the Danes ensure that cycling measures are well funded, or incorporated into road modernisation, because they recognise that this investment saves costs on other infrastructure work, such as new roads or rail, which is significantly more expensive. This was recognised by the Eddington report on infrastructure for the UK Government which said that “Improving the attractiveness of walking and cycling, e.g. by creating or upgrading routes, can provide strong returns with wider BCRs sometimes over 10.” It also noted that “Well targeted smaller-scale walking and cycling schemes also have a beneficial impact on the environment due to the mode shift from car to these non-polluting modes.

The Dutch permit the use of car parking income to fund increased cycle parking provision.

As noted above, cycling infrastructure often does not need extra funding; rather, application of the road user hierarchy, TfL's Cycling Level of Service and London Cycle Design Standards to all traffic schemes, would enable cycling infrastructure to be realised as part of existing multi-billion pound road modernisation programmes.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

Cities in the Netherlands and Denmark are world leaders in the promotion and delivery of high levels of active and sustainable travel modes. This has the obvious benefits in terms of population health and air quality as well as reducing motor traffic congestion. Despite enjoying levels of cycling far higher than those in the UK continental cities continue to work towards growth in cycling.

In central Amsterdam the modal share of cycling is 50% while in the city as a whole cycling's modal share of journeys is more than a third. In Copenhagen the current modal share of cycling is 45% with an aspiration to exceed 50%.

Other cities with aspirations to be world leaders in terms of 'liveability' and sustainability are seeking to boost cycling use and improve their cycling infrastructure. New York, Paris, Seville, Barcelona, Bogota, Portland and others are all investing in their cycle infrastructure and reaping the benefits.



8 January 2016

Title of consultation

National Infrastructure Commission – call for evidence

Organisation

National Infrastructure Commission

Introduction

The London Fire and Emergency Planning Authority (LFEPA) runs the London Fire Brigade (LFB). The 17 members of the Fire Authority are appointed by the Mayor of London. Eight are nominated from the London Assembly, seven are nominated from the London boroughs and two are Mayoral appointees. LFB is the busiest fire and rescue service in the country and one of the largest firefighting and rescue organisations in the world. We are here to make London a safer city and our vision is to be a world class fire and rescue service for London, Londoners and visitors. We will always respond to fires and other emergencies, but our work has changed over the years with a much stronger emphasis now on fire prevention and community safety.

Response

3. London's transport infrastructure

3.1) In line with the published terms of reference, the Commission is reviewing the evidence base and the strategic options for future investment in large-scale transport infrastructure improvements in London. The questions that the Commission is particularly keen to focus on in this initial phase of work are:

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

The changes that increasing population pressures will bring to housing, businesses and services may present challenges to the London Fire Brigade in protecting London and Londoners. This has already been demonstrated in the increased use of 'Sheds for Beds'. The increased use of non-standard or non fire compliant accommodation or business premises may bring social challenges including the increased risk of fire and the associated economic and social costs.

In addition, the challenging and ageing population demographic may create additional social and economic challenges in London. This includes a shift in the care landscape to an increase in vulnerable persons living independently in housing not designed to support their care needs.

The promise of 'night tube' and the changes that this may bring to the night time economy in London are broadly welcome. We anticipate that night tubes will evolve to include the DLR, Crossrail, and Crossrail 2 networks. The London Fire Brigade anticipate that this will significantly change the night time economy of London and our citizen's behaviour. This in turn may change the profile of risks that Londoners face and type and number of emergencies. This may impact across the spectrum of the services we provide with a potential mobilisation increase to London Underground premises due to the night use. Office hours will change too as improved transportation in and around London may enable 24/7 working practices.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

- How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?

The London Fire Brigade has played a full part in the design of major transport infrastructure projects in London including Channel Tunnel Rail Link, Woolwich Arsenal Extension, DLR car expansion, Crossrail and Crossrail 2 and Silvertown Road tunnel. Our work on reducing the impact of operational incidents on these networks and the London Underground system has produced positive results across the planning, construction, testing and commissioning phases. The engagement of the Fire and Rescue Service and adoption of lessons learnt from our experience should be considered a priority to reduce unnecessary costs arising from over-engineering the infrastructure. There have been instances where the lessons have not been learnt, particularly during the construction phase, which have impacted on time, cost and the capability of the emergency services to respond to incidents during the construction phase.

- What might their potential impact be on employment, productivity and housing supply in London and the southeast?

Supporting the delivery of a safe, resilient and secure mass transit system, on time and on budget will support the general social and economic vitality of London and the southeast.

With current and future demographic projections, there is a need to find at least 450,000 jobs for Londoners in the next ten years with another 400,000 homes too.

Large areas of London including the Upper Lea Valley and Battersea Nine Elms area have been earmarked as having the potential for both transport and residential redevelopment. This could help create communities, thousands of jobs and the improved transportation would give an added boost to already existing local businesses.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

We have been engaged with planning for Crossrail since the early 2000s. Unfortunately some of the benefits from lessons learnt were not recorded and agreed. Various changes to the project's management resulted in the learning being lost. To remedy the omission has resulted in increased cost and risk to the project. Methods of learning from previous projects could be improved. The introduction of a dedicated LFB seconded Officer to the project at an early stage could greatly benefit the project and reduce risks and therefore costs to both the scheme and emergency services.

Part of Crossrail 2 project's 'over site development' at stations and shafts could be used to provide GLA facilities (fire stations) and also further alleviate the housing issues faced by London by incorporating social housing within the footprint. This could allow older stations, with larger footprints, to be developed to partially fund the joint development. This would further assist change in the LFB, provide us direct access greater numbers of public for community safety matters.

- 5.3)** We may publish any submissions made; if you believe there is a reason why your submission or any part of your submission should be considered confidential please provide details.

The detail of the relationship between the LFB and Crossrail, and the detail relating to lessons learnt is commercially sensitive.

The Commission is subject to legal duties which may require the release of information under the Freedom of Information Act 2000 or any other applicable legislation or codes of practice governing access to information.

Rt Hon Andrew Adonis
Chair, National Infrastructure Commission
HM Treasury
1 Horse Guards Road
London SW1 2HQ

8th January 2016

Dear Andrew

National Infrastructure Commission call for evidence

I am writing to you to set out London First's views in response to the National Infrastructure Commission's call for evidence. We support the creation of the National Infrastructure Commission and welcome the fact that the need for large scale transport improvements in London has been identified as one of three key future challenges. As you would expect, our submission focuses on London's transport infrastructure.

As you know, London First is an independent business membership organisation whose mission is to make London the best city in the world in which to do business. Our members include the capital's leading employers in key sectors such as financial and business services, property, transport, ICT, education, creative industries, hospitality and retail.

We welcome the Government's commitment to investing in infrastructure as a driver of economic growth, and in particular its commitment in the recent spending review to support £11 billion of new investment in London's transport to the end of the decade. Such investment on its own is, however, insufficient to meet the scale of growth facing London – something tacitly recognised through the creation of your current study. Enabling London to meet its longer term growth potential will require continued investment into the 2020s if we are to avoid serious overcrowding on public transport, regular station closures and worsening road congestion.

We hope that the Commission will endorse the need for prompt and positive decisions on future investment in London's transport infrastructure, particularly in Crossrail 2. With the right investment decisions, we believe that London holds significant potential to support additional economic activity to the benefit of the UK as a whole.

We would of course welcome the opportunity to meet with you or your team to discuss these issues further.

Yours sincerely

David Leam
Infrastructure Director

National Infrastructure Commission call for evidence Representation from London First

We welcome the opportunity to provide a London business view on the pressing infrastructure challenges being examined by the Commission ahead of the March Budget. As a London-based organisation, our submission focuses on the challenges facing London's transport system. However, we make some opening comments on the importance of securing good transport connectivity in general, which apply both to London and to other UK cities also being considered by the Commission.

Infrastructure's role in supporting economic growth is now widely recognised. Analysis by the IMF has shown that "*in a sample of advanced economies, a 1 percentage point of GDP increase in investment spending increases the level of output by about 0.4 per cent in the same year and by 1.5 per cent four years after the increase*". (See [London's Infrastructure: Investing for Growth](#) for further details).

While we are not well placed to comment on the merits of specific proposals being considered across the north of England, we believe that if government is to address regional imbalances this will require intelligent interventions such as improvements to transport infrastructure around the UK. While it is by no means a dead cert, strengthening transport connectivity between northern cities could plausibly contribute towards creating a stronger agglomeration economy in the north.

At the same time we must not lose sight of the fact that in London and the SE, the UK is fortunate to have one of the most successful and productive agglomerations in Europe, even the world. Sustaining London's continued success generates the economic returns that support investment right across the UK. Given this, we must avoid falling into the trap of thinking that as a country we should somehow choose between investing in infrastructure in London or in cities elsewhere. If the UK is to secure sustainable economic growth we must do both.

We also welcome the creation of Transport for the North. The London model of a Mayor and city-wide transport authority has transformed the capital's ability to provide good day-to-day transport services and to plan and deliver new infrastructure and services that meet the needs of Londoners. Transport for the North has the potential for a similarly beneficial impact on cities across the north.

Finally, we believe that a key constraint facing all UK cities is their limited capacity to self-invest, given the much lower levels of fiscal and political autonomy UK cities have relative to their international counterparts. We say more on this issue below.

London's transport infrastructure

Taking the Commission's five questions in turn:

1. *What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?*

With the right decisions, London's economy has the potential to grow further and faster in support of UK productivity. London is a unique global hub for talent, business,

finance and global visitors. It is a very productive city, with Inner London having the highest GDP per capita in the EU, which also helps drive productivity elsewhere in the country as firms locate related business functions outside the capital. We recently supported the London Enterprise Panel in producing an economic development agenda for the capital ([London 2036: an agenda for jobs and growth](#)), which sets out how London is well placed to continue to grow in a changing global economy.

London's success is also of benefit to the UK at large. As a global business hub, London serves the country as the principal location for corporate headquarters. It is the UK's international gateway for talent, tourists, and investment. Construction and infrastructure spend on London projects directly benefit many parts of the rest of the country. London also makes a significant net contribution to the UK's overall tax revenues - £34 billion in 2013/14 alone.

London is projected by the GLA to grow to 10 million people by the early 2030s and to exceed 11 million by 2050. Employment is also predicted to rise significantly – from 4.9 million London based employees in 2011 to 5.8 million in 2036. Such projected growth is testimony to the capital's continued attractiveness as a world city. Yet as London grows, the transport infrastructure that enables the city to function comes under greater strain. A legacy of historic underinvestment over past decades compounds the problem.

If a growing London is to fulfil its economic potential for the UK as a whole and maintain its competitive advantage globally, it needs investment in its transport infrastructure, much of which is already operating at or near its limits. To ensure we can successfully mobilise a growing population into the most economically productive region in Europe, London needs a transport infrastructure plan beyond 2020, with agreed priorities and committed funding.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

Effective infrastructure delivery requires two things. First, London needs an agreed plan which identifies and prioritises future infrastructure need across sectors, focussed on driving enhanced productivity, competitiveness and economic growth. Targeting the programme in this way is essential as this generates the additional value and revenues which support sustained investment in London and the wider UK. Second, there needs to be the long-term funding and financing to pay for that infrastructure.

On the first of these points, the Mayor of London has taken a significant step forward in planning for growth with the recent publication of the GLA's London Infrastructure Plan 2050 and the creation of a new Infrastructure Delivery Board. The Plan identifies a range of transport priorities for London, including upgrades to existing tube, rail and road infrastructure, as well as additional new transport infrastructure.

We welcome the commitment in the recent spending review to support £11 billion of new investment in London's transport to the end of the decade. However, such investment on its own is insufficient to meet the scale of growth facing London. Enabling London to meet its longer term growth potential will require continued

investment into the 2020s across all transport modes if we are to avoid serious overcrowding on public transport, regular station closures and worsening road congestion.

This takes us to funding and financing. London has remarkably limited capacity to self-invest and is more dependent for funding on central government in key sectors such as transport. We therefore welcome the National Infrastructure Commission's review of London's transport infrastructure as we believe future planning by both central and London government needs to take place in earnest now.

Turning to London's roads first, the network faces significant capacity pressures. These will in part need to be addressed through improved traffic management systems and through making it easier for road users in the peak, such as freight, to operate at other times of day. However, new capacity will also be required, starting with the long overdue completion of proposed new river crossings to the east of London. For the longer term more radical and difficult options such as new underground roads and more sophisticated congestion charging also need to be explored.

On the Tube and rail we believe that there remains some scope for further upgrades to existing lines, through modernised signalling and new trains - which enable more capacity through higher frequencies, as well as greater reliability. Inevitably, however, the potential for greater benefits is much more limited on the numerous lines that have already been upgraded. We also see scope for further devolution to the Mayor of rail services within London as franchises expire, to enable services to be better integrated with the wider London transport network and better aligned to the needs of users.

The introduction of Crossrail and a revitalised Thameslink by the end of this decade will enhance London's rail capacity and provide some breathing space on some parts of the network. But London's rate of growth is such that new infrastructure will also be required if we are to successfully harness population growth into economic growth. We endorse the Mayor's argument that there are numerous potential transport schemes in the capital which would enable additional economic growth, jobs and housing – and believe Crossrail 2 should be an immediate priority for the 2020s.

As the former Chair of London First's [Crossrail 2 Task Force](#), you will know that London business is a strong supporter of Crossrail 2 as a regional transport scheme that will add significant new rail capacity, while supporting 200,000 new homes across London and the south east (and around 60,000 jobs across the UK during its construction). You will also be familiar with the report of our subsequent [funding group](#), chaired by Francis Salway, which described the case for building Crossrail 2 as "overwhelming". We believe that the arguments set out in these reports in favour of Crossrail 2 remain compelling, and urge the Commission to support Crossrail 2 as an early funding priority to enable its delivery over the 2020s.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

As with similar major projects at this stage of development, Crossrail 2 should continue to be subject to value engineering to bring down its cost. We also see

scope to further maximise the benefits of the scheme, in particular by better joining up new transport infrastructure and development than has often happened in the past.

We believe that future transport projects should be more ambitious early on about the scale of commercial and residential development that is both possible and appropriate around stations (our response to question 5 highlights experience in other cities). Chapter 3 of our Crossrail 2 funding report outlined the significant value uplifts occurring around Crossrail stations – only a small proportion of which were captured to help fund the project. We must now plan and deliver Crossrail 2 as an integrated transport and development project, not just a new railway.

We welcome the creation of the new Crossrail 2 Growth Commission to identify areas of potential development opportunity. Actually realising enhanced ambitions for residential and wider development will require sustained political leadership and in some places policy change, for example to planning policy regarding density and height, re-use of existing industrial land and, selectively, of green belt. It may also require the creation of bespoke special purpose vehicles to plan, lead and drive development on the ground. Ultimately, to realise additional development, politicians will need to will the means as well as the ends.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

For transport investment, the biggest challenge is funding: paying investment back over time. Transport for London (TfL) incurs most of the costs and the benefits are widely spread across society, although some are captured in increased tax take, largely by central government.

To help meet future investment needs, London will need to continue to utilise the various, albeit limited, revenue raising measures it already has discretion over (principally fares and charges, some taxes and developer contributions). For large-scale new projects such as Crossrail 2, Crossrail provides a good example of how a mixed funding approach can work, with funding flowing from national government (principally through grant), London government (principally through fares) and the private sector (through the business rate supplement and various forms of developer contribution).

Separately, the Northern Line Extension to Battersea is being funded by the private sector through CIL and the retention of business rates for a period. This income stream is supported by a government guarantee, with the project being delivered by TfL. Similarly, other UK cities have agreed 'City Deals' with HM Treasury whereby the proceeds of future growth are dedicated – alongside other forms of local contribution – to help fund infrastructure schemes that help stimulate additional economic activity.

Our Crossrail 2 [funding report](#) in 2014 identified a number of options which we believe show that a workable funding package can be negotiated to enable the project to go ahead. While some of the cost figures have risen since then, so too will potential value uplifts, so we remain optimistic that a viable funding package can be constructed and are willing to help work with central and London government and London businesses to develop a funding package as we did for Crossrail 1.

In the absence of substantial fiscal devolution, a funding package for Crossrail 2 will inevitably require additional support from government through some combination of grant, guarantees and retained tax revenues. This is perfectly reasonable given the much greater net benefits to the national economy that investment in London's transport infrastructure generates.

We believe that some form of greater devolution of tax revenues would increase the capacity of London government to raise revenues locally and accountably; it would increase the certainty as well as range of funding streams; and, perhaps most importantly, it would strengthen the financial incentives for London and local government to take what are often locally difficult decisions over housing and infrastructure investment as they would see a greater share of the rewards. Such an alignment of incentives has strong potential to support higher levels of economic growth in the capital than would otherwise take place.

The main focus of London business is, however, on achieving the outcome – sustained investment in London's infrastructure – to support economic growth. We are pragmatic about precisely how that is achieved.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

We have two main points. First, we would emphasise that Crossrail and Crossrail 2 are themselves good examples of London learning and applying the lessons of other world cities. Paris in particular has a long tradition of successfully planning and delivering regional rail links (in the form of the RER) – as London is now belatedly doing with Crossrail and Thameslink, and seeking to through Crossrail 2.

Second, we would highlight the experience of major metropolitan areas such as Hong Kong and Singapore which have been extremely effective in integrating transport infrastructure with high-density, high-value development. This has brought significant gains through creating additional opportunities for housing, employment and retail, and has also generated significant additional economic value – a proportion of which can potentially be captured to help fund transport infrastructure.

This is not to say that we should attempt to simply replicate those models in the UK as there are important differences in land use planning policy and how development is undertaken in practice. We should however draw on these models for inspiration and encouragement to apply existing policy tools, such as the CIL, towards similar ends here.

We believe that future transport projects should be more ambitious about the scale of commercial and residential development that is both possible and appropriate around stations. As noted above, realising this ambition may in places require changes to planning policy regarding density and height, re-use of existing industrial land and, selectively, of green belt. It may also require the creation of bespoke special purpose vehicles to plan, lead and drive development on the ground.

London Luton Airport Operations Limited (LLAOL) response to the National Infrastructure Commission's Call for Evidence

Introduction - The need for aviation capacity growth in the UK

1. This response is submitted on behalf of **London Luton Airport Operations Limited (LLAOL)**, the operator of London Luton Airport (LLA). LLA is the 5th largest and one of the fastest growing airports in the UK. In 2015 the airport handled a record 12.3 million passengers. The airport indirectly employs over 8,600 staff and is a key economic driver for the surrounding Three Counties region (Bedfordshire, Buckinghamshire and Hertfordshire), bringing in a total of £732 million in GDP locally in 2013.¹
2. **Aviation is a vital component of the UK economy.** The Airport Operators Association (AOA) has calculated that the sector contributes over £52 billion to the UK economy, supports a million jobs and pays almost £9 billion a year in taxes. The strategic importance of airports is set to rise even further with the demand for air travel to increase by 1-3% a year to 2050, with passenger numbers predicted to increase to 315 million in 2030 and 445 million by 2050¹.
3. **LLAOL supports the creation and aims of the National Infrastructure Commission (NIC).** Infrastructure investment is one of the most important drivers of economic growth in the UK and therefore LLAOL welcomes the Government's focus on this area. The creation of the NIC, coupled with further plans for infrastructure construction outlined in the Government's Infrastructure Bill 2015, are encouraging signs of the Government's commitment. However, LLAOL is disappointed that aviation infrastructure is not a specific concern of the Commission. As we have outlined above, aviation growth is essential to the prosperity of the UK economy. We acknowledge the NIC's argument that it does not want to revisit the work of the Airport Commission, but the expansion of Heathrow and Gatwick forms only a part of the country's airport capacity. We call on the NIC to revise its focus and consider the totality of the UK's aviation industry in its thinking.
4. **Furthermore, LLAOL believes that the NIC can be a vehicle for urban economic growth.** LLAOL shares the view of many in the aviation industry, that by improving London's transport infrastructure to better connect regions to London, the Capital can harness the benefits of these satellite areas for commercial and economic good. London's regional airports are great examples of these areas of wealth creation. The NIC should therefore consider how it can help to improve road and rail links from London to its regional airports so they can continue to fulfil their role in connecting people and business to the Capital.

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5. **LLA is growing.** In December 2013 LLAOL got the go ahead to begin a £110 million redevelopment of the airport site. This construction programme is now well underway and is set to grow the capacity of the airport from 12 million to 18 million passengers by 2020. A LLAOL commissioned economic impact assessment, undertaken by Oxford Economics and published in November 2015, calculated that LLA's contribution to the national economy is set to increase by 77% from £1.3 billion in 2013 to £2.3 billion per annum by 2030. Such a huge increase in the economic output of the airport shows just how vital aviation infrastructure growth is to the UK economy.
6. Therefore, LLAOL believes that the **Government should provide support to regional airports** to enable them to grow. As outlined above, LLA is set to increase its capacity by six million by 2020. LLAOL calls on the Government to recognise the vital role that regional airports play in acting as key economic engines for the UK, particularly in the south east of England. The Airport Commission's final report states that it is **"imperative"** that regional airports like Luton continue to grow and make best use of their capacity, and we repeat our call to the Government to ensure that we are allowed to do just that when it publishes its next Aviation Policy Framework in 2016. We accept that airport capacity is not a part of this inquiry, however we urge the NIC to recognise how regional airports can assist in the growth of London as a major world economic centre through better surface access links.

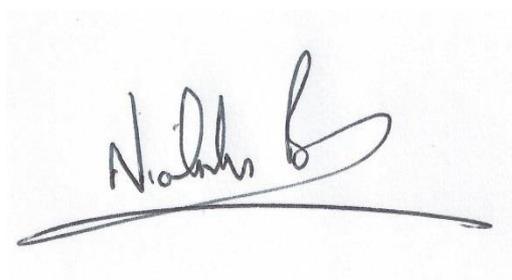
The importance of London's transport infrastructure to LLA's success

1. **LLAOL believes that improved surface access to London's airports is vital to the success of London's transport network both now and in the future.** It is imperative that LLA remains a viable option for both commuters and passengers from central London. For this to happen, a number of key improvements to the rail infrastructure between London and LLA are needed to cater for the extra capacity provided for by the redevelopment. These improvements include:
 - i. LLA is the fastest airport for passengers to reach from central London with a journey time of only 19 minutes. However, this train service is only available once an hour and LLA remains the only London airport without 'Express' services. LLAOL is therefore engaging with the Department for Transport in the build up to the East Midlands rail franchise to ensure that this one fast train per hour is increased to four. This achievable change would essentially provide LLA with a comparable 'Express' service from St. Pancras International to Luton Airport Parkway Station.

- ii. The journey between Luton Airport Parkway Station and the airport itself is currently a suboptimal solution for passengers. A shuttle bus ride is required to complete the journey from the rail station. LLAOL accepts that this is an issue that needs to be addressed to deliver the excellent customer experience that our passengers expect. LLAOL and its main shareholders, AENA and Ardian, are currently exploring a number of solutions:
 - A light rail solution connecting Luton Airport Parkway station to the airport site.
 - A heavy rail solution that would create a spur connecting the airport site directly to the main rail line to central London.
2. **LLAOL can provide support to the Government's investment strategy for transport infrastructure.** LLAOL is prepared to help the Government ease the financial burden of this construction by funding the surface access upgrades outlined in point (ii) above by itself. LLAOL and its shareholders, AENA and Ardian, are simply seeking explicit support for its plans from the Department for Transport.
3. **LLAOL can support the NIC** in how it can best include aviation infrastructure development into the Commission's thinking. As a first step, we recommend meeting with Commission members to outline in greater detail why aviation infrastructure is essential to the UK's infrastructure stock and why the Heathrow and Gatwick debate can easily sit outside the broader discussion on improving the overall quality of the country's airports.

Thank you for taking the time to read this submission. I would be happy to discuss the issues raised with Commission members at the earliest convenient opportunity.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Nick Barton', with a long horizontal flourish underneath.

Nick Barton
Chief Executive
London Luton Airport Operations Limited (LLAOL)

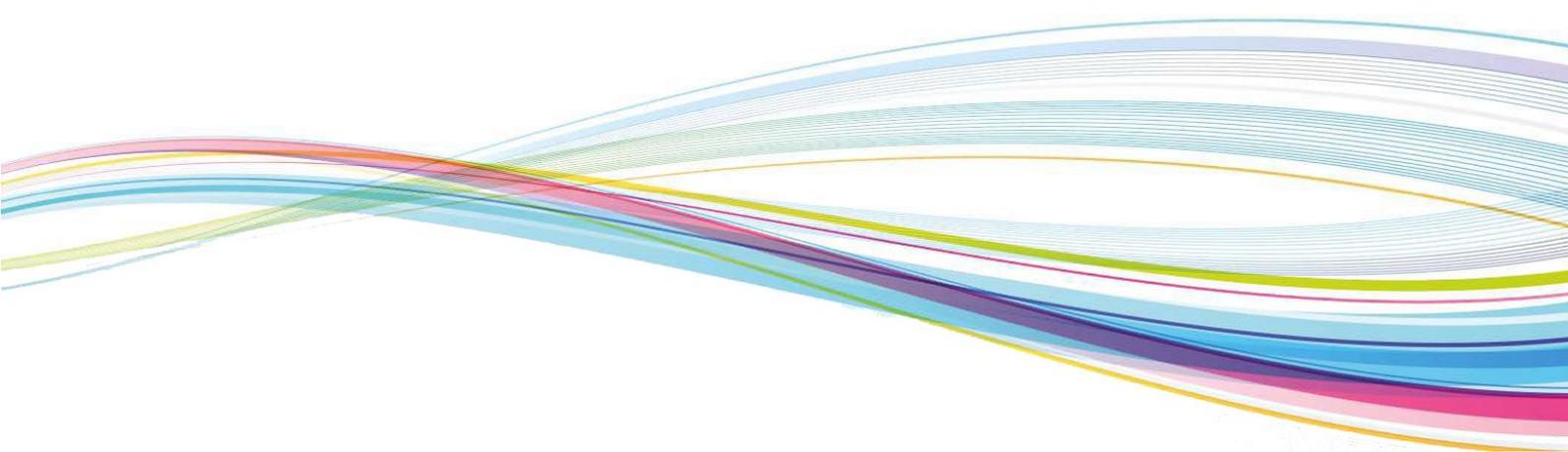


your pension our world

London Pensions Fund Authority

**LONDON PENSIONS FUND AUTHORITY
CALL FOR EVIDENCE TO THE NATIONAL
INFRASTRUCTURE COMMISSION OPEN
CONSULTATION**

7 JANUARY 2016



Introduction

London Pensions Fund Authority (LPFA) welcomes the National Infrastructure Commission's Open Consultation into the development and funding of the UK's long-term infrastructure needs.

In submitting our response to the consultation, we do so as a fund within the Local Government Pension Scheme (LGPS) which:

- Has already in its own right made direct investment into a number of smaller-scale infrastructure and construction projects; and,
- Will, as part of a larger funding pool (explained below), also be a prospective direct funder of larger-scale infrastructure projects in general, whether nationally or regionally-focused, or within a specific sector, such as transport or utilities.

As such, our response to this consultation outlines:

- Why we consider direct investment in infrastructure to be a highly desirable strategic asset allocation option for LGPS funds;
- How the wider LGPS is evolving in the shorter term to pool funds so that the sector can participate in larger-scale infrastructure funding opportunities;
- Our own experience to demonstrate how LGPS funds can successfully collaborate for pooling purposes and to fund larger-scale infrastructure development;
- Proposals for a mechanism whereby infrastructure opportunities could be more effectively and speedily matched with prospective LGPS investors.

Why we consider direct investment in infrastructure to be a highly desirable strategic asset allocation option for LGPS funds

Infrastructure is a very attractive investment for pension funds. It provides inflation protection, since assets often include an inflation linkage. Moreover, it produces a long-term income with consistent stable cash flows over a long term time horizon. The scarcity of good quality assets and active management also leads to capital appreciation. And, there is the opportunity to benefit from supernormal returns, since there is often an element of development risk.

However, as the LGPS is currently structured, with multiple smaller funds, it is not easy for these smaller funds to invest in this asset class. Currently, infrastructure makes up a very small amount of LGPS assets under management (AUM). Scale and expertise is required to be successful. LPFA has actively been calling for collective investment between LGPS Funds as a positive step forward, both in enabling LGPS funds to address their deficits and to facilitate much-needed investment in UK infrastructure.

How the wider LGPS is evolving in the shorter term to pool funds so that the sector can participate in larger-scale infrastructure funding opportunities

The LGPS is currently undergoing a period of radical reform, which will see the 89 individually-small pension funds that currently make up the scheme, potentially join forces and pool their c. £200bn AUM to create a number of £25bn+ wealth funds from 2018.

Through collaboration, these pooled funds will have the capacity to scale up their direct investment in large-scale infrastructure projects in the same way that, for example, overseas-based Sovereign Wealth Funds and pension funds (e.g. Ontario Municipal or Australian Super) have been able to invest. To-date as individual small funds, LGPS funds have typically lacked the scale to invest directly in infrastructure and have, in the main, been restricted to investing in funds or funds of funds. These options are often expensive and do not necessarily offer the long-term return that funds seek.

As the National Infrastructure Commission may be aware, a two-stage submission process is already underway, run the DCLG. Briefly, the first stage completes on 19th February 2016, by when individual LGPS funds are required to submit their initial pooling proposals to government. Thereafter, refined and completed submissions will be required from funds by 15 July 2016.

Funds' proposals are to include, amongst other things, how infrastructure will feature in a fund's investment strategy and how the pooling arrangements will improve the capacity and capability to invest in infrastructure. Government expects that pooling proposals which meet its criteria will be in place within 18 months. This is a relatively short timescale for a new and very significant pool of funding to be available for UK infrastructure.

Pooling will undoubtedly make the LGPS funds a valuable long-term funding source for those UK infrastructure projects that offer the appropriate level of risk versus reward over the long term in relation to the liabilities to be matched. And, importantly, LGPS funds are directly connected to their regions and are potentially ideal 'local partners with local knowledge' for regionally important infrastructure projects.

We are thus making this submission to ensure that this potential source of long-term funding is considered by the National Infrastructure Commission in its Call for Evidence.

Although LPFA cannot 'speak' for other funds within the LGPS, we can show by our own experience that there is already a strong appetite for pooling to create scale for direct investment in infrastructure.

Our own experience to demonstrate how LGPS funds can successfully collaborate for pooling purposes and to fund larger-scale infrastructure development

The LPFA is one of the 89 authorities that make up the LGPS in England and Wales. On our own, we have some £4.6bn assets under management (AUM) and we look after the long-term pension provision for around 80,000 active, retired or deferred members.

We have already been an active participant in pooling arrangements, specifically to enable us to increase our direct investment in infrastructure and, more generally, to expand our fund, so we have the capacity to invest directly in a number of asset classes. At present, we invest 5.5% (£270m) of our fund in infrastructure, with an ambition to grow this to 10%.

Our current projects include:

- To provide 85% of the funding for the fast-track creation of new high-quality homes in East London. The development will include 150+ private-rented-sector homes, 40+ for affordable rent and 30+ for shared ownership, whilst the project will also improve access to the popular Thames Barrier Park.
- In 2014/2015, we collaborated with a like-minded fund, the Greater Manchester Pension Fund (GMPF), to create a £500m joint infrastructure investment fund. The first long-term investment – a renewable asset – was announced in October 2015, with more to follow. Previously, both LPFA and GMPF had individually made direct investment in smaller-scale infrastructure projects in their respective region. This collaboration is a natural next step for two funds that have experience of direct investment in infrastructure and have now gained valuable in-house expertise in this type of investment.

We are also actively pursuing new partners to build this partnership for the express purpose of what the National Infrastructure Commission is aiming to meet – to further invest in projects from house and road building, to commercial and mixed use developments, or large scale regeneration projects. Our aim is to provide a vehicle for other LGPS funds to invest in infrastructure and thus grow the pot substantially.

We are currently in discussions with the DWP and Treasury about this option and would welcome the opportunity to provide the Commission with further information.

- LPFA and Lancashire County Pension Fund have created a £10bn pool. This is the first partnership of its kind within LGPS and once it is FCA approved (expected within Q1 2016), the fund will be open to multiple LGPS funds to collaborate and pool resources. This pooled fund will invest across a broad range of asset classes and again bringing to bear their individual past experience, infrastructure will feature highly in strategic asset allocation.

Proposals for a mechanism whereby infrastructure opportunities could be more effectively and speedily matched with prospective LGPS investors

Pooling will allow funds to harness resources, use economies of scale and share talent in order to make a difference in investing in infrastructure. However, pooling only solves part of the problem. Whilst it may allow us to access sufficient funds needed to invest in larger-scale projects, it does not help us to source and access infrastructure deals.

Along with the Local Government Association, we are advocating an LGPS body which could match infrastructure opportunities with prospective investors.

We believe local government is the ideal partner for these private infrastructure deals. Innovative councils can identify projects suitable for direct investment and are in a key position to collaborate with investors to develop these ideas. It also goes without saying that they negate a certain level of political risk by acting as a local partner in a multinational consortium.

Arguably nationally important projects should be funded by public borrowing as the cost of capital will most likely be lower than the equity returns institutional investors require. However, with the Government's stated objective of reducing public sector borrowing it creates a scarcity of available 'balance sheet'. Nevertheless, we believe Government should be creative in leveraging the balance sheet available and seek ways in which it can share/offset the low probability, but large impact, risks that would put off private investment (e.g. Construction risk in large Greenfield projects).

The LGPS body, which we firmly believe needs to be created, would play a pivotal role in matching investors to investees and assist in attracting private investment.

It would be responsible for gathering information about potential infrastructure and housing investments, and subsequently matching councils and private investors together, presenting the right opportunities to these interested parties, so they could put their own money forward through co-investment. We believe this body will be most successful if it were also deploying capital directly into many of the same projects. This will ensure efficient deployment of resources toward projects that are more likely to be investable and engender confidence amongst the end co-investors.

In order to fulfill its role, the body would also need to have a properly staffed investment function with an agreed set of criteria, potentially working in parallel to the Commission. A strong symbiotic relationship would clearly exist between the NIC and this proposed body; we would welcome the opportunity to speak about this in more detail.

January 2016

National Infrastructure Commission: Call for Evidence

Response from the London Stansted Cambridge Consortium

London Stansted Cambridge Consortium

The London Stansted Cambridge Consortium (LSCC) was formed in June 2013 as a strategic partnership of public and private organisations covering the area north from Tech City, the City Fringe, Kings Cross, and the Olympic Park, up through the Lee Valley, the M11, A1 and A10 road, the East Coast and West Anglia Mainline rail corridors to Stevenage, Harlow and Stansted, and through to Cambridge and Peterborough. The consortium brings together 18 local authorities and the Lee Valley Regional Park, around a common growth agenda, with a cross-party Board composed of Leaders and Lead members.

Crossrail 2 is seen as an important element in the long-term future of this corridor and we are therefore pleased to make a submission to the National Infrastructure Commission's call for evidence.

In summary

- The London Stansted Cambridge Consortium strongly supports Crossrail 2 and the significant impact this will have on the accessibility and connectivity of the region;
- 4-tracking the West Anglia mainline north of Tottenham Hale in Control Period 6 as an early precursor to Crossrail 2 will help to maximise the benefits of Crossrail 2, accelerating growth by nearly a decade;
- Crossrail 2 is vital for the continued economic growth of this region because it will:
 - Support the global competitiveness of this internationally important high-tech, high growth economy;
 - connect areas with growth and development potential with areas of employment opportunity – increasing the capacity for growth in leading sectors;
 - tackle lost productivity from concentrated disadvantage by opening job opportunities in the wider region to people in poorer areas with low rates of employment;
 - support economic and jobs growth along the whole of the route;

- shape growth in ways which enhance liveability overall, and concentrations of activity in the areas that most want them;
 - alleviate capacity problems on other lines, specifically the Victoria and Piccadilly Line;
 - improve the speed and reliability on lines that will share the Crossrail 2 infrastructure.
- As Crossrail 2 progresses there must be close coordination with the planning authorities to ensure that the full benefits of this investment are captured in the long-term planning for the region;
 - Other investment will be needed to support the levels of growth projected, including in our strategic road network, as well as in assets such as the Central Line.

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

The principal challenges will be:

1. Supporting the high-knowledge, high-growth economy, not only in central London, but also in key locations such as the Lee Valley corridor, Cambridge, Hertfordshire and Essex. This region's competition is global, against locations such as Boston, "Silicon Valley", Berlin and Singapore. In terms of growth rates we currently compare favourably, but investment such as Crossrail 2 is key for retaining our competitive strength.
2. Supporting the high-levels of population growth in the region. The 2001 to 2011 census demonstrated that the LSCC region delivered 10% of England's growth in that 10 year period. Similarly ambitious growth projections and plans are being developed in the region for the next plan period to 2031.
3. Airport capacity: Stansted Airport has significant capacity for growth within its current planning permission, with no additional runway.

Major investments are the only way to really unlock potential future growth in the London Stansted Cambridge corridor. A handful of smaller schemes will not have the same transformative impact in the area, as 4 tracking the West Anglia Line, with a commitment to build Crossrail 2.

Global economic significance

London and Cambridge are ranked first and fourth respectively in the FDi (Foreign Direct Investment) Intelligence "Top European Cities of the Future" produced in 2014 based on their favourability for inward investment. Cambridge already has over 320 foreign-owned enterprises, supporting nearly 20,000 jobs and contributing almost £5bn in turnover. Hertfordshire LEP notes a 61% increase in inward investment decisions since 2012/13. In addition 14 Cambridge-born companies have revenues over \$1bn, with two (ARM and Autonomy) valued at over \$10bn. Not investing here could mean that business goes abroad and the UK loses out.

Housing delivery

ONS forecasts predict the need for 16,800 new homes a year in the LSCC area, although this may prove higher.

Early delivery of 4-tracking will bring forward by up to a decade much needed new homes for the region, as well as significant employment growth in the Upper Lee Valley. The approval of the Tottenham Hotspur stadium, as well as progress on Meridian Water demonstrates not only the scale of the ambition, but also how rapidly change and growth is happening.

On-going case making

The LSCC has been working to demonstrate the economic case for significant investment in the West Anglia Line, and specifically the delivery of 4-tracking in the Upper Lee.

Last year the consortium published "[The Strategic Case for Investment in the West Anglia rail route](#)", setting out:

- a) The huge economic importance of the London-Stansted-Cambridge Corridor;
- b) The large levels of economic and population growth already happening in the corridor;
- c) The role that investment in the West Anglia Line will have in enhancing the labour mobility and economic effectiveness of the region.

As part of its support for the *West Anglia Taskforce* the LSCC is developing a more in-depth analysis - examination of economic characteristics and trends of local economies along the West Anglia Main Line by June 2016.

This includes:

- Full economic assessment / baseline,
- Appraisal of land/housing demand and needs from established documents and methods (e.g. the East of England Forecasting Model) ,
- Review of local plans, major developments and permissions that are 'material' to West Anglia route and improvements,
- Individual district profiles (allows more detailed consideration of improvement/works options),
- Overview of other planned and desired transport majors – road, rail, public transport

In addition the consortium is delivering workshops with local partners to examine this in more detail: LEPs, planning authorities, counties and private sector.

This work is being developed with the Crossrail 2 team, in conjunction with the GLA and TfL and will be made publicly available.

The chair of the London-Stansted-Cambridge Consortium is a member of the Crossrail 2 Growth Commission, as well as the West Anglia Taskforce. In addition

the LSCC supports the independent London-Stansted-Cambridge Growth Commission. All are looking to report in the early summer. The LSCC will work to support a coordinated approach on the development of their work and ensure that the National Infrastructure Commission is aware of the development of their various findings.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

The LSCC is not in a position to discuss all the strategic infrastructure needs for London.

However we raise the point that past alignments of Crossrail 2 included proceeding via Leytonstone northwards, which it no longer does. Consideration still needs to be given to Central Line services, and the growth planned along this north-east element. Enhancements will be needed along the Central Line and we will be seeking further discussions with TfL on this.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Early deliver of 4-tracking

The Chair of Network Rail, Sir Peter Hendy, in a recent speech stated there is a clear case for early investment in Crossrail 2, with West Anglia Main line 4-tracking occurring in Control Period 6 – 2019-2024.

The early delivery of 4-tracking the West Anglia Main Line (WAML) north of Tottenham Hale is one of the major deliverables to increase the benefits of Crossrail 2. The Upper Lee Valley corridor has the potential to deliver 10's of thousands of new homes for London and the wider South East. The WAML is currently only two tracks, which means that fast long distance services, such as the Stansted Express, come in conflict with slower, inner suburban stopping services. Not only does this restrict capacity and line speeds it also causes poor reliability on the route. The STAR scheme, delivering additional services between Angel Road and Stratford, confirmed for Control Period 5, recognises that additional capacity is needed to unlock sites such as Meridian Water and Tottenham.

Early completion of 4-tracking, in Control Period 6 as a precursor to Crossrail 2 will bring forward much needed housing and economic regeneration by up to a decade.

The LSCC is looking for early WAML implementation of enabling works:

- Committed schemes must be delivered as soon as possible including enhancements between the Upper Lee Valley and Stratford. This is specifically the STAR scheme, which we were pleased to see remains committed for delivery in Control 5 in the recent "*Hendy Review*" published in November 2015;

- Development of solutions to the 5 level crossings identified as high safety and performance risks including suitable alternative provision;
- Junction and line speed improvements at existing pinch points;
- New platform provision at Stratford station should be pursued so that there is future capacity to serve a growing corridor;
- Design for four tracking along with necessary powers and land purchases.

Segregation of faster long distance services and slower inner suburban services, ensuring the two services do not clash with each other, is vital.

The early enhanced link to Stratford and the Olympic Park would provide this key location with its only rail link to the north, as well as strengthen the Lee Valley link, supporting economic growth to the north.

Links to Stansted Airport

The Airports Commission specifically raised the need for early investment to improve the rail link to Stansted Airport, with their Chair writing to Network Rail calling for an early investigation to its feasibility.

Stansted Airport currently serves 22.5 million passengers a year and is the only major airport in the south east with runway capacity today and room to grow in the future. With a new runway in the UK at least 15 years away, it is vital that Government make the most efficient use of current airport infrastructure, and improving surface transport access should be a key tenet of this approach.

The airport also employs over 11,000 people and is the biggest single site employer in the East of England. As the airport continues to grow, it will need to widen its labour pool and better transport links are critical, particularly if Stansted is to be seen as a viable and attractive location for skilled and un-skilled labour.

Crossrail 2 will greatly enhance the accessibility and connectivity of the airport, specifically for passengers in south west London and Surrey which are currently underserved by transport links to Stansted. Four tracking the WAML will deliver faster and more frequent trains while connectivity with Crossrail 2 will further help to unlock spare capacity at Stansted and meet the demands of a growing airport labour market. The interchange at Tottenham Hale between Crossrail 2 and Stansted Express services will be critical to creating a seamless door to door passenger experience.

Rather like Heathrow Airport, which is served by the Heathrow Express, Heathrow Connect and the Piccadilly line, longer-term consideration should be given to the opportunity for Crossrail 2 to provide a stopping service to the airport.

Linking the economy of the region

Locations such as Harlow and Stevenage have major growth ambitions, delivering not only new homes but a strong diverse economy. They are already home to high-tech businesses as diverse as GSK, Airbus and Raytheon, while public sector investment, such as the relocation of Public Health England to Harlow and the cell therapy manufacturing to Stevenage, will further accelerate this.

Overall investment must not be seen as just serving the needs of London, but also making links to already strong regional economies, in locations such as Hertfordshire and Essex. The links northwards for both the west and east branches of Crossrail 2 need to ensure strong connectivity.

We note that the Thameslink upgrades will have a significant positive impact for connectivity between locations such as Stevenage and Cambridge with central London and onwards to Gatwick.

Cambridge

As noted Cambridge is a globally competitive location for life sciences and high technology innovation, with significant expansion planned over the next 20 years.

The business network Cambridge Ahead cites the key barriers to future growth as:

- a) congestion getting to the city and its employment locations;
- b) access to talent and the need to extend the city's labour market;

We must see investment beyond servicing London's needs. Investment in additional capacity in the West Anglia Main Line must provide additional capacity for Cambridge. Relatively small investments, such as an Addenbrooke's Station (a site projected to deliver 20,000 new jobs in the next decade, including the relocation of AstraZeneca HQ), and at Ely junction (improving Cambridge's role as a rail hub), will further maximise the benefits of Crossrail 2 investment.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

As has been seen with Crossrail land and property values raise in expectation of future enhancements. There must be close coordination between the GLA, TfL, London Boroughs and other planning authorities to ensure that planning policy is coordinated to maximise the benefits for the region.

A key issue is to ensure that we build in the funding arrangements to give the private sector certainty about their levels of contribution to the funding of Crossrail 2, plus local contributions. Planning authorities will be developing their policies (for example social infrastructure and affordable housing contributions) which reflect changes in policies to sites, driven by the increased accessibility delivered by Crossrail 2. We need to ensure that land prices do not rapidly increase, based on speculation, affecting the viability for high quality development. For example viability considerations are often cited as the reason why lower levels of affordable housing is proposed than that set out in planning policy.

To make sure that the benefits of Crossrail 2 are captured there needs to be an early comprehensive assessment of current land values, which should then be used to capture increases and recoup some of the uplift. We would also look to the private

sector to provide significant funding as businesses will directly benefit from London having a major new route.

LB Redbridge undertook a Crossrail Corridor Area Action Plan to coordinate development and enhance the regeneration impacts at key sites. Building on the work of, for example, the Upper Lee Valley Opportunity Area Planning Framework consideration is required for a collaborative regional planning mechanism, working across administrative boundaries to ensure a coordinated approach to maximising the benefits of Crossrail 2 whilst ensuring that new development does not threaten the valley's landscapes and ecology.

National Infrastructure Commission call for evidence, 8 January 2015

Via email: londonevidence@Infrastructure-Commission.gsi.gov.uk

London TravelWatch is the statutory body representing all transport users in London and rail users within the wider London Rail Area which includes London's airports

London TravelWatch welcomes the opportunity to respond to the commissions' consultation, as it touches on areas of significant concern to users of London's transport networks, and which London TravelWatch as a passenger representative body has carried out significant research in recent years.

London TravelWatch has produced a series of transport user priorities for the 2016-20 Mayoral term based on our research and our passenger contacts. This response reflects these priorities:

1. Sustained investment to meet London's ever-growing transport needs
2. A road network that makes the best use of scarce capacity
3. As many of London's rail services as possible coordinated by the Mayor
4. Reliable bus services that keep up with the pace of change
5. Simpler fares, better value for money and a fairer deal when things go wrong
6. A co-ordinated approach to transport interchanges
7. Transport networks accessible to all
8. Reliable, accessible and timely information
9. Everyone able to travel without fear of crime or anti-social behaviour
10. Disruption effectively managed

Consultation questions

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

Transport is a derived demand. It therefore follows that it needs to respond to the economic and social challenges of population growth, job creation and distribution, the supply of housing, the affordability of fares and regional connectivity. Provision of transport can open up opportunities for education, employment, and the provision of services that would otherwise be difficult to access; it can allow development of housing that is both desirable and affordable: and develop regional economies through the benefits of aggregation, knowledge sharing and sociability. Equally, congestion, crowding, a poor living environment and the lack of effective and reliable transport services can hold back the development of new housing, the creation of new jobs and educational opportunities. The challenge is to improve accessibility in a way that is affordable to both the fare payer and taxpayer, and which meets the aspirations for service standards for both.

The capacity constraints that create congestion and crowding issues are in our view the most important issues that the infrastructure commission should focus on, and where investment is most needed. Creating additional capacity can be done in a

number of ways, and will range from large projects such as Crossrail 2 to modest small scale investments e.g. improving walking routes within interchanges or additional entrances to existing stations. These smaller schemes can add considerable value compared to their modest costs in creating new capacity, relieving crowding and congestion that exists already, improve connectivity and reduce journey times.

The need for this continued and enhanced investment in capacity is reflected in the views of passengers. During focus groups for our recent affordability research¹, it was apparent that even amongst low earners, there was a clear desire for investment aimed at reducing journey times, crowding and congestion, even if this meant more expensive ticket prices, although there was an overall resignation to the high cost of travel. Behind this was a recognition that better transport connectivity gives better access to a wider range of job and educational opportunities, allowing for career progression and increasing income, and housing that would better suit their circumstances and aspirations.

In a complex city such as London, where the most journeys are made using a variety of modes this suggests that improving the number and quality of public transport interchanges² is the most cost effective way of delivering additional capacity on the transport network, delivering economic growth and sustaining population growth. London TravelWatch argues that the investment in London's transport in recent years has been the catalyst that has allowed London's economy and population to grow.

This growth has in part been sustained by the continuous income stream that fares on the public transport network and the Congestion Charge on roads, and it would be important that this is protected to allow investment to continue, and in the case of roads there is an argument that pricing should play a greater role. Nevertheless passengers tell us through our research³ that their primary concerns are the affordability of the transport network, its' reliability and the travelling environment that they experience.

Affordability

London TravelWatch with its partners Trust for London and London Councils recently conducted research on transport affordability in London⁴. This found that:-

¹ http://www.londontravelwatch.org.uk/documents/get_lob?id=4100&age=&field=file Living on the edge: the impact of travel costs on low paid workers in Outer London.

² http://www.londontravelwatch.org.uk/documents/get_lob?id=4040&field=file Interchange Matters: Passenger priorities for improvement

³ http://www.londontravelwatch.org.uk/documents/get_lob?id=3780&field=file The London Travelling environment : what consumers think

⁴ http://www.londontravelwatch.org.uk/documents/get_lob?id=4100&age=&field=file Living on the edge: the impact of travel costs on low paid workers in Outer London.

- Most people living in London are resigned to the high cost of travel; they need to get to work and have no choice but to put up with the costs involved because they lack viable alternatives.
- 64% of all Londoners who commute to zone 1, which equates to around 1 million people tend to choose the quickest or best journey available to them to get to work, including many people on a lower income. 36%, or a projected 500,000 commuters, are not using the quickest or best journey option available to them.
- However, travel cost is one of the main factors in the route chosen by one in four, or a projected 180,000 people, commuting to Zone 1 from outer London and the equivalent of around 145,000 workers living in outer London choose the cheapest route to work rather than the shortest or most convenient.
- 9%, or a projected 70,000, outer London residents who commute to zone 1 could get to work faster if they spent more.
- Over one in five, or a projected 156,000, commuters who commute from outer London⁵ to zone 1 have to cut other spending to pay for travel to work.
- London residents earning more than £600 per month have to work approximately 20 minutes every day they work to pay for that day's commuting costs. This increases sharply to 54 minutes for those earning £200 to £599 and 1 hour 56 minutes for those earning less than £200.
- Travel to work accounts for almost one tenth of a manual worker's average earnings.
- Lower earners are more likely to use the bus and some choose this method to reduce their travel expenditure.
- Everyone is concerned about rising travel costs but people on low incomes are worried that further increases could affect their ability to earn a higher salary by working in Zone 1.

This concern with cost is a challenge, as there will need to be a balance between securing funds for investment and the need to restrain cost increases for transport users.

London's passengers, through the fares they pay, cover a significantly greater proportion of operating costs of their transport system than other areas of the UK and comparable cities in Europe. This has the benefit in that this allows a much greater certainty of investment return and long term sustainability of the system.

⁵ For this report, outer London is the 14 boroughs situated around the edge of the Greater London Authority area plus the boroughs of Brent, Ealing, Haringey, Barking & Dagenham and Merton.

However, rail passengers tell us that their number one priority for improvement is better value for money for the price they pay for their tickets⁶.

Reliability

Bus passengers in London (who account for over half of all public transport users in London and over half of all bus users in Great Britain) tell us that they want their services to be more reliable, and have consistent journey times. This is especially true of younger people in education or entering the employment market, who are unable to afford faster modes of public transport or more expensive private transport.

Rail passengers also want their trains to operate more reliably, consistently and have sufficient capacity for them to travel in comfort. This will require upgrades to capacity of the network in terms of train frequency and length. The National Rail network in London needs to be provided with services that are of a 'turn up and go' nature i.e. at least every 15 minutes throughout the operational day.

Travelling environment

When we asked passengers about their travelling environment they told us of many concerns. Most importantly is their concern for their personal security, not just being a victim of crime, but just as importantly having to deal with anti-social behaviour.

Passengers also regard overcrowding, particularly at peak travelling times, as an important issue for them which exacerbates other discomforts such as noise. Finally, though not at the top of passengers concerns they do want stations, trains and buses to be clean and clear of litter and graffiti which they associate with anti-social behaviour

2. What are the strategic options for future investment in large – scale transport infrastructure improvements – on road, rail and underground – including, but not limited to Crossrail 2?

- How should they be prioritised, taking account of their response to London's strategic transport challenges, reliability, journey times and connectivity to jobs?
- What might their potential impact be on employment, productivity and housing supply in London and the South East?

As noted above the priorities for improvement in the transport network need to be focused on improving affordability (including passenger value for money and the

⁶ Transport Focus research <http://www.transportfocus.org.uk/research/publications/rail-passengers-priorities-for-improvements-october-2014> , London TravelWatch research . http://www.londontravelwatch.org.uk/documents/get_lob?id=3734&field=file and http://www.londontravelwatch.org.uk/documents/get_lob?id=3896&field=file

ability to access a wide range of jobs and services), reliability, capacity (including reducing crowding and congestion), connectivity (including reducing journey times) and improving the overall travelling environment.

Therefore any transport schemes that are brought forward need to meet a number of tests that cover these elements :-

- Does it increase the accessibility of jobs and services?
- Does it improve the reliability of the existing network?
- Does it provide sufficient additional capacity where it is most needed?
- Does it reduce the incidence of crowding and congestion?
- Does it improve the overall connectivity of the London and South East region?
- Does it reduce overall journey times?
- Does it improve the overall travelling environment?

London TravelWatch has previously recommended⁷ a number of infrastructure projects that would meet these tests, address the issues that have been identified above and increase the opportunities for employment growth and housing provision. These include:-

Rail

- Developing the Chiltern rail route within Greater London, with improved frequencies and a diversion of longer distance services to serve Old Oak Common (for the development corporation area and interchange with Crossrail and other rail routes).
- A bigger interchange at West Hampstead with platforms on the Chiltern and Metropolitan lines, reducing journey times and increasing accessibility of jobs and services
- Resignalling London's national rail routes to enable higher frequency services to be run
- Linking the Great Northern City branch (Finsbury Park to Moorgate) to rail routes in South London e.g. the London Bridge – Tulse Hill corridor, relieving congestion in the City, but enabling development of areas such as that around South Bermondsey station for new housing
- Improving rail access to Heathrow Airport with western and southern rail routes, including the opportunity to develop housing and improve access to job opportunities.
- An electrified Reading – Gatwick Airport rail route – outside of London but of strategic importance to it, because of its ability to give an alternative to travel via London or by car via the M25.

⁷ http://www.londontravelwatch.org.uk/documents/get_lob?id=3916&field=file Potential future transport projects for London – June 2014

- A reinstated and electrified Southall – Brentford rail link and an electrified West Ealing – Greenford rail route to improve access to jobs and open up new opportunities for housing, and to remove the need for non-standard diesel operation.
- New capacity at central London rail and underground stations through new entrances and link tunnels e.g. Covent Garden to Temple, new entrance to Waterloo East, City Thameslink to St. Pauls. Camden Town to Camden Road, Regents Park to Great Portland Street and linking the two Edgware Road stations.
- A new station at Maiden Lane serving the Kings Cross developments, but from the catchment area of the North London Line, improving access to employment and new areas of housing.
- Improving connectivity in South London by building a bigger interchange at Brixton with platforms on the London Overground and Victoria – Dartford routes, and an interchange at Brockley with platforms on the Victoria – Dartford route. These would open up access to employment and housing across a very wide area.
- Extending the Bakerloo line to Lewisham, Bromley North, Hayes and West Croydon, with significant opportunities to improve access to employment and encourage housing development.
- An ‘outer circle’ rail route linking London’s outer boroughs, to improve access to housing and employment.
- Upgrading the Felixstowe – Ely – Nuneaton rail freight route to allow diversion of freight services away from the Great Eastern, North London and West Coast Main Line routes to free up capacity for passenger services.

Light Rail

It is of concern that the role that light rail in London could play is being overlooked. Passenger loadings along some existing corridors and potential growth corridors will be such that light rail would be the appropriate mode. We have previously supported the proposed extensions to Croydon Tramlink, West London Tram and the Cross River Tram proposals. Like these latter two, there are many other corridors where high levels of bus passenger numbers would imply that light rail may be an appropriate mode. The potential of further light rail schemes in London should be investigated.

Roads

Unlike passenger transport schemes where the demand can, to some extent, be managed by price, additional road capacity in an urban transport environment will be self-defeating because of the latent demand for road travel. Similarly measures to encourage modal shift will have the effect of releasing latent demand.

London TravelWatch supports a wider, more sophisticated system of roads pricing in order that demand can be managed properly on London's road network and the need for additional road infrastructure can be assessed. This would enable more reliable essential motor vehicle journeys and have the additional benefit of releasing funds for investment in transportation schemes.

That said London TravelWatch has supported the mayor's east London river crossings subject to various caveat regarding tolls, the provision of public transport and assurances that the wider road network does not become more congested.

One of the key infrastructure investments in London is the continued programme of bus priority. London TravelWatch believes that buses should have priority on all bus routes and that there is much to do to achieve this.

Cycling and walking

London TravelWatch supports continued investment in safer cycling and walking to allow and encourage increased use of these modes of travel, especially for shorter journeys, thereby freeing up additional capacity on the public transport and road networks thereby improving journey time reliability, crowding and congestion.

In particular, reusing redundant railway infrastructure for cycling and walking schemes e.g. Finsbury Park to East Finchley and Alexandra Palace, to reduce traffic congestion on major arterial roads by offering alternative routes and modes of transport, and on improving the public realm generally. Other potential ideas could include a pedestrian and cycle link between Canada Water and Canary Wharf.

Interchange

Londoners, make more multi-modal journeys than elsewhere, typically using two or three different modes to get around. This means that interchanges play a significant role in the experience of London's travellers. Research by London TravelWatch shows what passengers think good interchange looks like⁸.

Good interchange is often overlooked, but is as important as the services from the interchange. Increasing the usefulness of existing routes and interchanges; adding new ones to existing networks where this would steer growth towards the areas and routes that have the capacity to absorb this, and to relieve existing congestion and crowding. Examples of this would be the extension of the Bakerloo line into South East London⁹ and developing a Chiltern Metro, including additional platforms at West Hampstead.

⁸ http://www.londontravelwatch.org.uk/documents/get_lob?id=4040&field=file Interchange matters: passenger priorities for improvement.

⁹ http://www.londontravelwatch.org.uk/documents/get_lob?id=3940&age=&field=file Bakerloo line extension consultation response.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Co-ordination of HS2 at Euston with a future Network Rail scheme at their station. We have received assurances that any Crossrail 2 scheme would be built having regard to a future Network Rail scheme it would seem poor value for money if the Crossrail 2 proposals were developed in isolation. We strongly recommend that Euston is developed as a single scheme.

Interchange is really important to passengers who regard interchange as necessary, but not desirable. Crossrail would be an opportunity to develop first class interchanges at the stations served. We would expect Crossrail 2 to do as Crossrail 1 has and develop proposals for not only the stations, but also the public realm around them and the routes to nearby transport objectives such as the local town centre. Unlike Crossrail 1 any additional public realm works should be funded.

The stations served by Crossrail 2 should act as catalyst for promoting development and regeneration at, above or nearby.

Consideration should be given to the extension of Chessington branch of Crossrail 2 beyond the London boundary to Leatherhead to form a through line, and open up area around Malden Rushett for housing development.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvement in London, including Crossrail 2?

- What is an appropriate local and regional contribution – given the potential distribution of benefits to business, residents and transport users and the wider economy – and how could this be achieved?
- What innovative funding mechanisms could be considered to support delivery of key schemes?

As stated above the affordability of the public transportation system is very important both in terms of the proportion of an individual's income, but also as a tool of transport policy. The latter is often forgotten, but if the cost of public transport is too high we know it will be used less. Some of the demand will translate into private motor vehicle use which will exacerbate London's problems of congestion.

In order to secure the maximum social, economic and environmental benefits that a good public transportation system can contribute to then public investment is required. In addition to passenger fares, a mixture of funding from general taxation, roads pricing and land / property value uplift should be used. Additionally it is vital that all passengers pay their way and that this is assured through high levels of enforcement.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied to London?

London TravelWatch's limited resources do not allow us to give direct comparisons with other areas, however, we note that in dense urban areas such as Hong Kong, development has been successfully tied to the implementation of transport schemes. This approach has been done in London in the past e.g. the Metropolitan Railway constructed Chiltern Court above a reconstructed Baker Street station: In the 1980's British Rail redeveloped the former Holborn Viaduct station to include the low level City Thameslink station and office development above. This could be repeated in the future, but with careful consideration of the needs of existing passengers and users during and after the construction period.

[contact redacted]

8th January 2016

London & Northern Evidence
National Infrastructure Commission
1 Horse Guards Road
London
SW1A 2HQ

RE: Call for Evidence

The Multi-Disciplinary Activity Group for Use of Underground Space (MAG2US) is a recently formed group of professionals aiming to improve subsurface resource management and spatial development. In response to a call for evidence by the Infrastructure Commission we would like to submit evidence and views in response to the following questions:

- Connecting northern cities – potential needs and delivery constraints (question 4)
- London's transport infrastructure – opportunities to reduce the costs of London's transport infrastructure (question 3)
- London's transport infrastructure – opportunities for delivery of large-scale transport infrastructure improvements in London, including Crossrail 2 (question 4)
- London's transport infrastructure – international lessons (question 5)

Background

Underground space is a complex, scarce and valuable resource, particularly in urban areas where we are more reliant on using the subsurface for physical infrastructure such as utilities and transport, containment of resources (energy & water), and storage of waste. A lack of integrated above and below ground spatial planning is currently leading to increased pressures on the subsurface. Where optimal use of the space is not pursued, resource functions are not protected and land for future infrastructure is not safeguarded. Subsurface planning is therefore vital to ensure a coordinated approach is taken to the development of above and below ground spaces in our cities, particularly in order to support the needs of Nationally Significant Infrastructure Projects.

Given large-scale infrastructure projects have both a surface and subsurface expression, they provide the opportunity to demonstrate the benefits of new city data management tools, infrastructure mapping and integrated city modelling (e.g. Building Information Models - BIM). Integrating these approaches at an early stage, through demonstrator projects could act as a catalyst for more strategic use of the subsurface and more sophisticated spatial planning of our urban areas and making it nationally consistent.

Potential delivery constraints to new transport infrastructure

Mapping potential project constraints

Late stage awareness of physical constraints to planned infrastructure can be costly. In order to better understand what lies beneath the surface of cities better coordination is needed between utility providers, transport operators, property owners, land use planning authorities and other government institutions. The risk of large infrastructure projects needing to undertake physical detours to avoid constraints such as building foundations could be partly reduced by creating a shared database of geological conditions, existing public assets, planned infrastructure projects, and development opportunity sites in cities. The alignment of Crossrail was influenced by the need to avoid over 200 existing obstructions including building foundations and other underground rail lines. Meanwhile Crossrail2 is likely to be re-routed via Balham rather than Tooting because of geological concerns.

Safeguarding Directions are an important tool in helping to deliver major infrastructure projects, however they are not able to address existing, unknown subsurface conditions or take a holistic approach to management of underground spaces. Although some data pertaining to critical national infrastructure might need to be omitted from a public register of subsurface assets, an appropriately managed central resource of underground data could help avoid late stage amendments to infrastructure projects. One example is the amendment to the draft Thames Tideway Tunnel Development Consent Order, needed to reposition the proposed replacement Blackfriars Millennium Pier. Integrated infrastructure mapping by the Future Cities Catapult with the city of Manchester successfully demonstrates the benefits of partnership working across the utilities sector for more robust planning for infrastructure growth.

Current resources available through the British Geological Survey (BGS)

NERC's British Geological Survey (BGS) and the National Geoscience Data Centre offers a digital data platform and a national geological model to help identify potential risks to delivery of infrastructure and other development projects. This data includes geological maps, 3D models and borehole logs which are used to inform infrastructure planning and design. These data, include geological maps, 3D models and borehole logs which are used to inform infrastructure planning and design. Since 2009, the collection of over 1.3 million UK onshore borehole logs have been released in digital form free of charge through the BGS web site¹, with over 750,000 downloads in 2015. For geotechnical data a new platform has also been developed which allows online submission of digital data from new ground investigations to enhance national data holdings². Several governmental and infrastructure organisations (e.g. Environment Agency, Scottish Water, TfL, ARUP) have made a commitment to use these new digital services and submit geotechnical data collected as part of development works and infrastructure projects.

Adoption of these open-data protocols, whereby existing data is re-used and new data is submitted centrally, maximises past investments in ground works, reduces site investigation costs and de-risks future investments and should be a standard, contractual requirement for all infrastructure projects.

The BGS has also redirected its UK geological survey programme to develop the National Geological Model (NGM)³ an integrated set of 3D geological models at various resolutions that is

¹ <http://mapapps2.bgs.ac.uk/geoindex/home.html>

² <http://transfer.bgs.ac.uk/ingestion>

³ <http://www.bgs.ac.uk/research/ukgeology/nationalGeologicalModel/home.html>

the primary spatial knowledge-base on the UK's geology. The BGS are adopting a digital approach to facilitate effective opening-up and sharing of the national geological model and underpinning datasets that is efficient and economically viable⁴. All outputs from the National Geological Model are compatible with BIM software⁵ and digital-services have been developed for the collation, display, filtering and editing of a range of data relevant to infrastructure projects. The NGM and supporting web-services, provide access to nationally consistent, expert geological understanding to support initial infrastructure feasibility and design and de-risk investment.

Opportunities for reducing the cost of transport infrastructure projects

Land acquisition & sub-surface development

One of the most significant costs associated with the delivery of major infrastructure projects is for the compulsory purchase of land. Although a £50 flat rate has been accepted as the nominal value payable for acquisition of subsoil earth needed for tunneling, increasing property prices, particularly in London are influencing the perceived value of subsurface space. The High Speed 2 project recently faced challenges from 204 parties who claimed that £50 was an insufficient payment for the subsoil, a number of respondents also sought confirmation of whether or not this policy would restrict their own subsurface developments, such as basement developments. The London Borough of Camden noted this as a particular issue in their area. Although the London Borough of Camden and several other London boroughs are developing planning policies to address the phenomena of large scale basement development, these generally represent reactionary, localised attempts to manage the construction impacts of developing subsurface space, rather than addressing hydrological impacts or broader strategic urban needs⁶. With residential basement depths of up to 15m and commercial developments such as the Edwardian Hotel Leicester Square with five basement levels, there is a concern that the physical cost of acquiring or insuring against damage to private subsurface developments could add unnecessary costs to the delivery of infrastructure projects.

Value versus cost

However, it is not just about reducing costs on large scale transport initiatives, but also recognising the wider benefits associated with infrastructure development. Currently the Cost Benefit Ratio used to value infrastructure projects adopts a prescribed formula which is too narrow. In January 1997 the Parliamentary Office of Science and Technology released the Tunnel Vision report, which concluded that:

“tunnel proposals have to overcome a number of hurdles to be accepted, and often must rely more on public and political pressure than the 'objective' appraisal system of the DoT. A useful future policy option might be to seek a greater social consensus on what aspects of the environment and quality of life should be protected from the adverse effects of new infrastructure, and from here, identify cost-effective solutions”.

Major changes in the business case framework rules for infrastructure projects should be encouraged. Health benefits, carbon emissions and international city competitiveness are also important measures of the benefits associated with mass public transport infrastructure. Where projects are deemed viable, city governments and infrastructure providers also need to become better at capturing the resulting value. Upgrades to the London Underground and the

⁴ <http://www.bgs.ac.uk/research/environmentalModelling/groundhogDesktop.html>

⁵ <http://www.keynetix.com/bimforthesubsurface/>

⁶ [https://www.rbkc.gov.uk/pdf/Final Basements Policy Jan 2015 adopted web.pdf](https://www.rbkc.gov.uk/pdf/Final%20Basements%20Policy%20Jan%202015%20adopted%20web.pdf)

construction of Crossrail have acted as strong drivers for real estate development, but despite the recent introduction of a Crossrail Levy and Community Infrastructure Levy, there are too few mechanisms for harnessing the uplift in property values to help fund further necessary infrastructure development.

Opportunities for improving delivery of large-scale transport infrastructure improvements

Strategic planning and proactive governance of subsurface resources is needed in cities, particularly London, where competition for underground space and resources is most pressing. Such a plan would allow a more strategic approach to benefits, such as locations of housing developments, commercial or residential developments around new or upgraded stations, etc.

One of the key advantages of strategic planning is that it requires involvement of all relevant stakeholders. This opens the way for seeking new innovative solutions. Rather than using the subsurface either for transport or energy solutions, it could lead to a combined solution serving both. The same holds true for the question of how to develop public spaces below the surface. To really create a new urban tissue below the surface, public connectors need to be created. Planning also stimulates thinking about future uses. Creating space below the surface has to be appraised against a much longer time scale than surface development given the long life span of these spaces.

Ideas and lessons learnt from international case studies

British expertise in property, law, engineering, environmental management and construction is some of the best in the world and our expertise in delivering complex infrastructure projects is highly regarded, however lessons can still be learnt.

International case studies

It is our strong suggestion that major UK cities adopt a three dimensional approach to spatial planning. Internationally there are a number of initiatives to better understand, manage and develop the subsurface, including:

- Helsinki - Although it's geology and land tenure is very different to London's, Helsinki has a three dimensional spatial plan that coordinates, connects, safeguards and provides a framework for the use of 600 underground spaces for mostly public infrastructure. Planned and existing land uses of the subsurface range from public swimming pools to data centres (where less energy is needed to cool the equipment and the surplus heat generated is then used for residential heating).
- Kuala Lumpur - In 2007 The Stormwater Management and Road Tunnel (SMART) infrastructure project in Kuala Lumpur, Malaysia introduced an 9.7km long, underground roadway and storm water retention tunnel that is divided into three sections that can be collated to absorb urban flood waters.
- Tokyo - In 2007 Japan introduced the Deep Space Utilization Law to legalise the development of spaces at least 40 metres below ground level for public utility infrastructure. The most significant attribute of this law is that when a road, railway or water utility company for example wishes to build a tunnel at 40 meters or more under the

ground, they are not required to receive the consent of parties owning or renting the land above the tunnel, nor are they required to pay them any compensation.

- Singapore - the Urban Redevelopment Authority (URA) has proposed 29km of underground links to improve pedestrian access and reduce congestion at ground level. At 20 designated locations private developers can receive cash grants from the URA to reimburse the cost of constructing pedestrian walkways beneath their properties, with the spaces also being exempt from the usual caps on Gross Floor Area (GFA).
- Tianjin - Since 2004 Tianjin in China has carried out extensive research on the development and utilisation of underground space. This has resulted in a series of documents, including the 'Utilization of Underground Space Planning in Tianjin Central City (2011-2020)'. Research undertaken to inform the 2011 and other earlier plans included a comprehensive survey of existing underground spaces in Tianjin city central and the aim now primarily is to construct under-ground nodes to link primary subway stations and public centres for commercial and parking purposes.
- Montreal - Montreal's underground RESO network is a set of city-enabled, privately-developed underground connections that ties much of the city centre into a climate-protected, traffic-free and vibrant pedestrian zone.
- Arnhem & Zwolle - In the Netherlands, a new model of analysis has been introduced for urban and land planning in Arnhem. The plan consists of three layers: occupation (plot oriented developments e.g. housing and offices); network (functions such as road and rail infrastructure); and the underground (consisting of all subsurface functions e.g. storage of water). The City of Zwolle has created a 'Vision on the Underground of Zwolle'. This document comprises a complete analysis of the underground space beneath the city.

In May 2015 'Think Deep: Planning, development and use of underground space in cities'⁷, was published by the International Tunnelling and Underground Space Association Committee on Underground Space (ITACUS) and International Society of City and Regional Planners - the book contains five detailed international case studies.

Sub-Urban research project

In 2012, the British Geological Survey together with other geological surveys in northern Europe, put forward a proposal to the Transport and Urban theme of the European Cooperation in Science and Technology (COST). The proposal advocated for greater interaction and networking between experts who develop urban subsurface knowledge and those who can benefit most from it. One product of this research cooperation is the creation of 'Sub-Urban'⁸. Sub-Urban is a European network of Geological Surveys, Cities and Research Partners working together to improve how we manage the ground beneath our cities. Glasgow is the UK's representative city in Sub-Urban and as such is already undertaking a number of applied research projects to investigate how their subsurface resources might be better used and managed. Initiatives include city subsurface spatial planning, integrated above-below ground BIM and heat extraction and storage through disused mines.

⁷ [ISBN: 978-94-90354-34-3](#)

⁸ <http://sub-urban.squarespace.com>

Conclusion

In summary, MAG2US would encourage the Infrastructure Commission to work with city governments to promote the importance of strategic planning and safeguarding of subsurface resources, in order to reduce risks to the cost and delivery of future infrastructure projects. Should the Infrastructure Commission or other government agencies require further advice or support regarding subsurface issues we would be happy to contribute our expertise where possible.

With Regards,

Multi-Disciplinary Activity Group for Use of Underground Space

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Response to the National Infrastructure Commission

8 January 2016

1. Summary

- 1.1 MAG welcomes the opportunity to make initial comments to the National Infrastructure Commission on the first two elements of its consultation: Northern Connectivity and London's Transport System.
- 1.2 The NIC has a key role to play in fully assessing the network of transport assets across the UK, the way they should be connected and how they will drive growth in the UK economy over the coming decades. To do that, a comprehensive look at the current and potential economic contribution of integrating road, rail and air connectivity is essential. While there are significant gaps in the evidence, modelling tools developed for the Airports Commission will enable the NIC to undertake this work.
- 1.3 On Northern Connectivity, the Commission must ensure that its plans focus not just on city to city connectivity but on the creation of an efficient transport network which integrates opportunity for international connectivity via the North's global gateway, Manchester Airport. It must also prioritise the development of east-west connectivity through the Northern Powerhouse Rail (NPR) network and high speed rail.
- 1.4 On London's Transport System, MAG is a supporter of Crossrail 2 and worked with stakeholders to promote its development. The need for enhancement of the West Anglia Main Line (WAML) is, however, already critical and must not be delayed until the arrival of Crossrail 2 in 2030 to deliver them.
- 1.5 We urge the NIC to recommend a phased delivery of enhancements to the West Anglia Main Line, ensuring the benefits of step-change improvements to services are realised ahead of Crossrail 2.

2. Introduction

- 2.1 Manchester Airports Group (MAG) owns and operates four airports in the UK (Manchester, London Stansted, East Midlands and Bournemouth), handling some 50 million passengers per annum. Our airports are nationally significant infrastructure assets, providing essential connectivity both for the regions they serve and the wider UK economy, contributing over £4 billion in GVA each year.
- 2.2 Aviation is a key driver of economic growth, creating jobs and facilitating trade. The sector contributes over £50bn to the UK economy and supports more than a million jobs directly. Airports, as the physical infrastructure that underpins the sector, should be considered vital national assets and therefore fully integrated into any national infrastructure plans set out by the Commission in due course.

- 2.3 While airports invest heavily in their own infrastructure, failure to meet the wider surface access needs of passengers wishing to travel seamlessly for business or leisure will limit connectivity and hamper growth. Road and rail access to UK airports very often defines both their catchment area for potential passengers and, in turn, their competitive position in attracting new airlines.
- 2.4 Investing in these schemes, therefore, that connect cities with major airports as well as each other, may stimulate stronger growth as well as greater regeneration potential. It will enable the most productive use of spare capacity and connectivity from all UK airports, inducing a catalytic effect for the regional and national economy.
- 2.5 The National Infrastructure Commission (NIC), therefore, has a key role to play in fully assessing the network of transport assets across the UK, the way they should be connected and how, in doing so, these assets will drive growth through better productivity and more effective utilisation. In assessing the UK's infrastructure investment priorities and enabling the integration of those spending plans, the NIC will address a long-term weakness in UK infrastructure planning. Too often, a siloed, project by project approach to capital investment has failed to harness the true value of the UK's network of infrastructure assets.
- 2.6 By taking a comprehensive look at the kind of connectivity the UK needs and ways of supporting more effective network planning for domestic transport infrastructure, the NIC will be in a position to co-ordinate the investment programmes required to get there. This consideration must, as a matter of course, include airports, airspace and air freight.
- 2.7 We believe there is currently a significant gap in the evidence base for this work. The dominant focus of the Airports Commission was to consider the most appropriate location for new runway capacity in the period to 2030. For example, the AC did not assess in any detail the future growth scenarios at other major UK airports, including Manchester and London Stansted. As such, we believe there is a need for the NIC to take a more broadly focussed analysis of the economic potential of a wider range of UK airports and the infrastructure required to support their growth.
- 2.8 Furthermore, although the Airports Commission identified short term priorities in its interim report, a number of its key recommendations have not been addressed by Government. We would encourage the NIC to look again at these issues and come to its own views on the strategic importance of the AC's recommendations.
- 2.9 The Commission's initial focus on Northern and London connectivity is naturally an area of considerable interest for MAG. As we have not yet had the opportunity to meet with the Commission or secretariat to discuss areas of most interest to MAG, we would be happy to provide further information at a later date, as appropriate. We are pleased,

therefore, to offer our initial views to the Commission as part of this consultation and would welcome the opportunity for further engagement over the coming months and years.

2.10 This response is focussed on the first two elements of the Commission's consultation.

3. Northern connectivity

- 3.1 Manchester Airport is the global gateway for the North of England and the largest UK airport outside London. The airport supports 21,500 on-site jobs and contributes £918million in GVA to the UK economy each year, of which £627m benefits the North West alone.
- 3.2 Currently, Manchester has more than 75 airlines operating to around 200 destinations worldwide. With runway capacity to serve 55 million passengers a year, it currently serves around 24 million with a strong mix of full service, charter and low-cost operators. This range of services and carriers caters for both tourist and business travellers, while handling over 100,000 tonnes of exports each year.
- 3.3 Over the last decade, Manchester Airport has been successful in bringing more direct, long haul services to the North of England, including to Dubai, Abu Dhabi, Qatar, Hong Kong, Singapore, New York, Washington and Chicago. In 2016, services to Beijing, Los Angeles and Boston will commence. In most cases, Manchester is the only UK airport north of London offering these routes.
- 3.4 MAG has recently announced its intention to invest £1bn in the Manchester Airport Transformation Programme. Over the next 10 years the airport will benefit from an overhaul of its terminal and other passenger facilities, introduce new technologies and improve access to the airport.
- 3.5 The £800m Airport City project is also being developed next to Manchester Airport's terminals and sits at the heart of Greater Manchester's Enterprise Zone. It aims to attract global businesses to the region, especially those that would benefit from having close access to both the airport's route network and its road and rail connections with the rest of the North and beyond.
- 3.6 The lure of these factors has already led to companies like DHL and Amazon announcing plans for major logistics operations at Airport City, helping to meet the project's target to create more than 10,000 jobs over the next decade. Its success hinges on two factors. The first of those is Manchester Airport's ability to continue to secure new long haul passenger and cargo services of relevance to potential occupiers. The second is being able to link to a modern and efficient ground transport network that would serve the logistics needs of businesses basing themselves there at the same time as enabling as many people as possible to access the jobs being created.
- 3.7 In many ways, the factors that will drive the success of Airport City also demonstrate Manchester Airport's ability to help drive the success of the Northern Powerhouse. MAG is committed to investment in the region and helping to rebalance the UK economy but Manchester Airport has the potential to play an even greater role and

there are steps the Government must also take to unlock that potential as soon as possible, to the benefit of the North and the wider UK.

The power of connectivity

- 3.8 It is not new to observe that businesses need connectivity to succeed. They rely on having good access to skills, supply chains and markets – both domestic and international. Poor transport links can, therefore, be an obvious barrier to success. Poor facilities, journey times, overcrowding and congestion affect the perception of proximity, reliability and easy access, which are vital issues for businesses, investors and tourists alike.
- 3.9 The area widely recognised as constituting the ‘Northern Powerhouse’ – covering the cities of Newcastle, Sheffield, Leeds, Manchester and Liverpool – is smaller in size than Beijing. However, its competitiveness – both domestically and internationally – is being significantly hindered by poor transport links, most notably from east to west.
- 3.10 Centre for Cities research shows that over the 10 year period from 2004, northern cities have had lower GDP per capita, fewer business start-ups, lower employment rates and lower population growth than the South East. For every 12 new jobs in the South, just one was created in the rest of Britain and seven of the ten cities/towns experiencing the lowest growth were in the north of England.¹

Rail access and the North

- 3.11 Compared to London and its commuter hinterland, existing rail services across the North are slow and without the required frequency, either for freight or passengers. This is constraining the development of new businesses and trade across the region, not least as people find it difficult to travel from one area to another and companies find it difficult to trade goods and services across the country.
- 3.12 One illustration of the way in which transport connectivity is serving the North poorly is commuting patterns, with between 85-96% of working people in the Northern Powerhouse cities live and work in the same city region. Fewer than 1% of people living in either Manchester or Leeds commute between the two cities, despite being just 36 miles apart. This lack of labour force mobility is emblematic of the poor connectivity between the major conurbations and must be addressed. Transformational performance improvements can only be delivered through transformational investment; an incremental approach will not achieve the step-change in performance that the Northern Powerhouse needs to become a reality.
- 3.13 Equally, access to Manchester Airport as the North’s only true global gateway is key to improving its trade, tourism and inward investment prospects. Long journey times to Manchester Airport limits the extent to which its connectivity delivers benefits to the

¹ Rochdale, Blackpool, Hull, Grimsby, Huddersfield, Wigan and Burney

region: businesses and passengers cannot reach the airport quickly or efficiently enough; and airlines cannot access large enough catchments to make new services viable. This, in turn, severely hinders the geographic spread of economic benefits from Manchester Airport's connectivity.

- 3.14 Put simply, better connections and vastly reduced journey times across the North would, therefore, have a transformative impact on the airport's competitiveness by simply bringing Manchester Airport's global connectivity closer to all Northern cities.
- 3.15 We strongly support Transport for the North's approach to these issues, which recognised in its interim report, published in November 2015, that the initial focus of its work around the 'Northern Powerhouse Rail' network was *'developing the case for substantially improved connectivity between the main cities of the North, and between these and Manchester Airport'*.
- 3.16 Widening the airport's catchment area in this way would improve its ability to attract new airlines and secure more direct and more frequent long-haul services to key overseas markets. That, in turn, would enable the economic/trade benefits associated with access to key global markets to be spread to a much greater area across the North. **Therefore, the Commission must ensure that its plans focus not just on city to city connectivity but on the creation of an efficient transport network which integrates rail and air, maximising the potential for the new Northern economy to maximise its potential internationally as well as domestically.**
- 3.17 Currently, access to the airport is primarily by road, rail and Metrolink tram services. Users of the latter two modes of transport are typically from the local catchment area rather than further afield, as current rail services often do not provide attractive options for passengers from the wider region. That is mainly due to long journey times, lack of frequency or the absence of a direct service. However, there is widespread demand for improved connectivity to the airport, as illustrated by the positive reception received by the announcement of new services as part of the recent TransPennine and Northern Rail franchise agreements.
- 3.18 The scale of the opportunity for transport accessibility can best be illustrated by the increase in total passenger catchment within two hours of the airport by public transport that would result from the delivery of high speed rail across the North. Current, limited, rail access to the airport – particularly west to Liverpool and North Wales – means the population within that catchment stands at around 8 million. We estimate that with the right East-West rail services (HS3) this could leap to 18 million and support new air services to a wide variety of new long haul markets. With further improvements to road and rail, this would only increase further.

High Speed Rail

- 3.19 MAG has consistently supported the development of high speed rail and we welcome further commitments by HS2 Ltd and the Secretary of State in December to developing a station stop at Manchester Airport in Phase 2b. Integrating the airport into the high speed network is important to the long term success of the Northern economy, increasing the number of people able to access its services and stimulating growth through competition with airports in the South East.
- 3.20 Further high speed rail from east to west (HS3), however, would have truly transformative impact on connectivity. With HS2 and HS3 together, there lies the potential to close the productivity gap between the North and South, which Treasury has estimated would equate to in excess of £40 billion additional GVA by 2030. Together they have the potential to reduce journey times to Manchester Airport by around 50% across the North and Midlands – effectively bringing key cities twice as close as they are today.
- 3.21 Initial work by Network Rail and HS2 Ltd last year has shown that dramatic improvements are indeed possible between Manchester and Leeds city regions, for example – making a journey time of 26-30 minutes comparable to Crossrail's connection between Heathrow and Canary Wharf – that can only serve to drive trade and labour movement between the regions. Connecting HS2 and HS3 with Manchester Airport would provide excellent connectivity for air passengers across the North and Midlands, connecting quickly the wider economic region to global markets and providing a complementary counter-weight to the London/South East economy.
- 3.22 MAG believes that development of east-west connectivity should be a priority for the NIC's work. Further, we agree with the Airports Commission recommendation that more weight should be given to the specific needs of air passengers when developing strategies for the UK's rail network.**

Economic benefit analysis

- 3.23 We anticipate that a key focus for the NIC will be to develop evidence to quantify the economic benefits associated with the infrastructure proposals that it considers. An important element of this for Northern Powerhouse Rail (NPR) will be to understand the wider economic benefits that would be generated by better city-to-city connectivity, and also by better connectivity to Manchester Airport from across the region.
- 3.24 NPR will expand the airport's catchment by improving access to key population centres across the North, and significantly increase the number of air passengers within the airport's two-hour isochrone. Airlines will respond to this expanded passenger market by launching new routes to previously unserved destinations as they become commercially viable.

- 3.25 Enhanced international connectivity from the North will generate significant wider economic benefits for the regional economy, particularly in terms of improved productivity and improved access to global markets. Assessing the value of these connectivity benefits should be a key priority for the Commission in its assessment of the NPR business case.
- 3.26 The Airports Commission recently modelled the value of the connectivity benefits associated with options for new runway capacity at Heathrow and Gatwick. The AC's work on these issues would provide the NIC with a ready-to-use suite of models to assess the aviation-related economic benefits associated with NPR and surface transport improvements for other airports.
- 3.27 The output from the AC's models would also provide the NIC with a consistent approach to valuing such benefits, and give the Government a more complete assessment of the economic benefits associated with airport growth over the coming decades. Following the Commission's initial report to the Chancellor in March 2016, we would encourage the Commission to address these issues in further detail for all major UK airports.

4. London's transport system

- 4.1 The Mayor of London and Transport for London have estimated London's population will increase by almost three million over the coming decades, reaching 11.3million by 2050. This will present significant economic and social challenges, particularly in terms of housing and jobs. The London Mayor's 2050 Infrastructure Plan identifies east London as a key area for economic development to accommodate this growth and the East of England is currently one of the fastest growing UK regions – it too will see a dramatic growth in population and economic output.
- 4.2 Transport schemes that improve cross-city access for North and East London are essential for linking new homes in the Capital's opportunity areas with jobs and services. For businesses, too, gaining access to a larger talented labour pool will facilitate increased growth and economic productivity.
- 4.3 Crossrail 2, for example will enable businesses like Stansted Airport to draw on a new labour market and tap in to demand for business and leisure travel. Economic and population growth is, naturally, one of the many drivers of passenger demand (forecast to increase by up to 3% per annum to 2050), which will inevitably place a strain on all London airports over that period.
- 4.4 So for London's airport capacity, it is essential to learn lessons from Heathrow's decade of capacity constraint. It is vital that, without revisiting the work of the Airports Commission, the National Infrastructure Commission develops a full understanding of aviation demand in the South East and recommends proposals to government that will look at medium and long term requirements for the sector.
- 4.5 Even being optimistic, it is likely to be 15 years before any new runway capacity is developed in the South East. London Stansted serves more than 22 million passengers per annum, predominantly through the provision of services with low cost carriers and charter airlines, but has existing capacity to support growth to 45 million passengers.
- 4.6 Making the most productive use of this spare capacity will be vital to maintaining choice and value for consumers and developing the best possible connectivity for the UK economy and to support this, the Airports Commission made clear recommendations for urgent improvements to Stansted's rail connections into London.
- 4.7 It recognised that only by improving journey times would it be possible to enlarge its catchment and improve services to key regeneration areas. Facilitating and capitalising on population growth in North and East London will enable Stansted to play a wider role in the London airports system.
- 4.8 Improved rail connectivity to London and Cambridge is critical to enable London Stansted to achieve its full potential. Doing so would provide passengers with greater

choice and competition and help to foster growth and regeneration along the London-Stansted-Cambridge economic corridor. The need for investment in the West Anglia Main Line (WAML) has also been acknowledged as a strategic gap in the rail network by Network Rail and we anticipate its inclusion in the Anglia Route Study, due imminently.

Integrating Crossrail 2 with a programme of WAML investment

- 4.9 MAG is a supporter of Crossrail 2 and has worked with TfL and other parties to promote its development. Careful consideration, however, must be given by the NIC to how the project is integrated into a wider programme of investment on the West Anglia Main Line. The need for enhancement of the West Anglia Main Line is already critical and cannot wait until Crossrail 2 is delivered in 2030 to deliver them. A phased approach to WAML improvements could see very significant improvements to service frequency, reliability and journey times over the intervening period and would dramatically contribute to the region's regeneration and economic growth, including through more productive use of Stansted.
- 4.10 We agree that a new rail link, enhancements to the infrastructure and a tunnel across London will deliver significant benefits for the rail network, the region and Stansted Airport. Crucially, it will free up space on the congested mainline into Liverpool Street, stimulate regeneration in key sites like the Lee Valley Opportunity Area, unlocking further jobs and homes and maximise the growth potential in the London-Stansted-Cambridge economic corridor.
- 4.11 For the airport, it will help to grow Stansted's catchment by improving travel times and accessibility to south west London, Surrey and beyond. It will also enable the airport to serve a greater share of the London market, both in terms of geography and the range of passenger services available, increasing choice and competition for consumers.
- 4.12 Prolonged underinvestment on the WAML has been a key factor in the decline in rail services to the East of England in recent decades. For example, journey times to the airport from central London are now up to 10 minutes slower than they were a decade ago. This deterioration in service has led to the share of Stansted's passengers using rail falling from around 30% in 2005 to 22% currently. More importantly, this deterioration in the quality of rail services has had a negative impact on Stansted's competitive position in the London airport market.
- 4.13 Evidence shows that poor performance and lengthy journey times deter passengers from using the airport and hold Stansted back from attracting new airlines. Strengthening the airport's rail connectivity is key to unlocking its potential as it will dramatically increase the catchment area for passengers into central London as well as support economic development and regeneration throughout North and East London, which is key to the Mayor of London's long term plans.

- 4.14 Faster, frequent and more reliable rail connectivity are key to attracting new airlines and passengers – diversifying the airport’s offer from low-cost European destinations to full service carriers offering competition on European routes and new long-haul destinations. This would foster competition with other airports and deliver economic benefits of growth across the region by making full use of Stansted’s spare runway capacity.
- 4.15 There is an urgent need for a major programme of enhancements to the WAML, which spans the short, medium and long term. This programme needs to be phased to deliver a step change improvement to journey times and reliability in the first instance followed by additional capacity and frequency to support economic growth and regeneration along the Upper Lee Valley over the long term.
- 4.16 While many of the longer term improvements on the WAML would be considered ‘large-scale’, such as four-tracking and Crossrail 2, in fact incremental and significant changes can be achieved more quickly and cheaply. In the short term, for example, improvements to timetabling emanating from the new East Anglia rail franchise and line speed enhancements in the medium term would see dramatic improvements in journey times and reliability for Stansted Express services over the next five years.
- 4.17 MAG has already completed detailed technical studies (in consultation with Network Rail, DfT and TfL) to develop an up to date assessment of the options for Stansted rail services and the WAML. It identified a strong business case for renewing the infrastructure to enable trains to operate at higher speeds along key sections of the line. Increasing speeds for the Stansted Express from 80 to 100mph would see journey times between the airport and London improved by eight to ten minutes, with corresponding time savings for commuters using services on the line, from Tottenham Hale in the south through to Harlow, Bishop’s Stortford and Cambridge in the north.
- 4.18 These faster trains would attract more passengers and widen Stansted’s catchment – increasing the number of potential passengers living within two hours of the airport by 7 million – taking the total to 22 million passengers. The present value of the additional fare revenue from these improvements is forecast to amount to more than £500million and deliver a benefit cost ratio (BCR) of 3.7 from investment of around £370million².
- 4.19 We believe it would be entirely feasible and appropriate for Government to commit now to delivering these essential line speed improvements early in CP6 and to take forward the planning and preliminary work for these enhancements during the remainder of CP5. This would require little or no up-front capital cost but would give certainty and confidence to airlines and stakeholders planning investment in the region.

² At 2014 prices, excluding optimism bias

- 4.20 Looking to the longer term, we have also campaigned in partnership with the London-Stansted-Cambridge Consortium, neighbouring local authorities and the West Anglia Task Force to bring forward investment in four-tracking the WAML as a precursor to the development of Crossrail 2. By delivering four tracking in the mid-2020s, this development would realise significant early transport benefits through a step-change in service frequency, journey times and reliability. For the wider London-Stansted-Cambridge Corridor, it would also support better regional connectivity by supporting additional inner suburban and regional rail capacity into central London.
- 4.21 **We urge the Commission to recommend that improvements to the WAML must be phased and delivered ahead of the delivery of Crossrail 2 and ensure the full integration of London Stansted Airport and Crossrail 2 services.**
- 4.22 In the round, for all future planning on rail, we agree with the Airports Commission recommendation that more weight should be given to the specific needs of air passengers when developing strategies for the UK's rail network.

Funding mechanisms

- 4.23 In light of uncertainty over the prioritisation and delivery of enhancements to the WAML, MAG has been considering ways to accelerate their delivery. As part of this work we have recently commissioned specialist consultants to explore and develop options that would enable third parties to fund and deliver the type of infrastructure enhancements envisaged for the WAML, drawing on the significant incremental revenues that would be generated as a result of the line speed enhancements.
- 4.24 As well as contributing to the Shaw Review of Network Rail, in which some of these issues are also being considered, we would be happy to share the conclusions of this work with the Commission once the study is complete. We anticipate this will be towards the end of January 2016 and would support the Commission's further consideration of these alternative options to facilitate this third-party investment. We suggest that a key requirement for these options will be that they should provide potential investors with a clear and easily understood template for investing in such infrastructure enhancements.

A SUBMISSION TO THE NATIONAL INFRASTRUCTURE COMMISSION CALL FOR EVIDENCE

Metrotidal Lower Thames Pool is an integrated infrastructure proposal that addresses two of the three national challenges identified in the call for evidence:-

London Evidence: Large-scale transport infrastructure improvements in London

Energy Evidence: Improving how electricity demand and supply are balanced.

The ten pages, accompanied by illustrations, address both challenges.

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2.1 Integration Benefits

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2.6 Tunnel Transport services

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2.9 Green-Growth

2.10 Agglomeration Benefits

1 INTRODUCTION AND EXECUTIVE SUMMARY

Metrotidal Lower Thames Pool integrates new flood defences for London with energy storage, a multi-modal tunnel, data storage, utility wayleaves and enabling development for 250,000 homes with corresponding employment. The integrated infrastructure provides economic growth without an associated increase in carbon audit. This green-growth is achieved through the integration of a flood defence system with a sustainable power plant that generates and stores zero-carbon energy for supply-on-demand. This offsets the energy demands of the new transport connectivity, led by rail, and the enabled development. The sustainable pool system includes energy-efficient data storage and distribution with an exceptionally low power usage effectiveness (PUE) and new utility wayleaves that serve the enabling development.

The result is full-spectrum enabling development in which housing, employment, energy, transport, data and utilities are fully integrated to generate green-growth benefits across the Greater Thames Estuary region.

2 THE METROTIDAL LOWER THAMES POOL AGENDA

2.1 Integration Benefits

The combination of the separate initiatives into a single, well-integrated infrastructure project reduces the planning overheads, construction costs and environmental impacts while increasing the net economic benefits, thereby producing integration benefits. Substantial integration benefits are realised by combining separate developments for new flood defence, a sustainable power plant, a Lower Thames Tunnel, data storage and utilities into one integrated system that supports growth across the Greater Thames Estuary region.

2.2 Flood defence

The Metrotidal agenda provides a new system of flood defence to protect London and the Thames Estuary from surge tides through to the 22nd century. The defences are provided in the form of a throttle working in tandem with flood storage capacity to reduce the level of an incoming surge tide. The throttle is located on the shipping channel and the associated flood storage is provided by a pool beside the Hoo Peninsula, with additional emergency storage across the marshes to the Isle of Grain.

The throttle has a weir and floodgates that admit water to the pool during the incoming surge and return it to the sea on the ebb tide. Existing monitoring systems provide over 24 hours advance-warning of the storm surge. This allows the pool to be drained during the preceding low tide and the floodgates closed to reserve the maximum flood storage capacity ahead of the surge tide. The variables of the incoming surge waveform and duration are recorded and analysed as the tide advances down the North Sea coast, enabling the most effective use of the available flood storage in the pool to be programmed before the storm surge arrives in the Thames Estuary. The level of the weir and area of the flood gates are then controlled to suit the programme. If additional storage is required in an emergency a weir and flood gates from the pool allows controlled flooding of the marshes beside the Isle of Grain.

The system is designed to allow the free movement of normal tides while restricting and limiting the incoming storm surge. The throttle and flood storage capacity of the pool then works in tandem with the existing Thames Barrier and capacity of the tideway to reduce the incoming peak surge. Accordingly the system protects all the flood risk areas upstream from the throttle including both the metropolitan areas and existing fresh water meadow habitats that remain at risk in the event of a surge under the current TE2100 proposals.

The flood risk to very substantial property, infrastructure and habitat assets upstream is reduced, enabling the Association of British Insurers (ABI) to redirect a proportion of the

premiums raised under the new Flood Re agreement towards funding the flood storage system. The balance of the flood defence cost can be made up by riparian rates and government grant comparable to that required for the TE2100 proposals. The flood storage pool impoundment doubles as a sustainable energy storage system and reduces the construction cost of the multimodal tunnel, consequently increasing the net economic benefits of the integrated system. The resultant net economic benefits are much higher than for the TE2100 investment programme, which addresses only the flood risks.

2.3 Sustainable Energy Storage

The Metrotidal agenda integrates flood storage and tidal power within the same impoundment, allowing the range within the impoundment to be pumped to treble the natural tidal range within the estuary. This allows the tidal power plant to increase peak output when required or store energy in the pool for delivery on demand. The energy for the pumping is provided by solar, wind and tidal power along with the forthcoming option of nuclear power from Bradwell in Essex. The solar energy is provided by floating arrays within the protection of the impoundment that generate up to 50MW per sq.km. The wind energy is provided from the London Array in the outer estuary and the tidal energy from the natural range at the throttle in the Thames generating power through turbines below the flood weir.

The combined solar, wind and tidal pumped-storage system can deliver sufficient energy to offset the energy demands of the multimodal tunnel and new rail systems, leaving surplus energy to be sold to the grid.

2.4 Lower Thames Tunnel

The Metrotidal agenda includes a multimodal, D2T2 Lower Thames Tunnel formed from a combination of cut-and-cover and immersed tube tunnel construction techniques. The costs

are reduced by maximising the proportion of cut-and-cover and minimising the length of the immersed-tube construction. For a Lower Thames Tunnel running between Leigh-on-Sea in Essex and Allhallows-on-Sea in Kent the pool impoundment reduces the cost of the tunnel by increasing the cut-and-cover approaches and reducing the length of immersed-tube tunnel across the remaining open tideway. The immersed tube tunnel sections are formed in a casting basin, towed into position and sunk into a prepared trench across the open estuary. There is sufficient width in Sea Reach to maintain port operations during the immersed tube tunnel construction.

Northern Portal Connections

The northern portals of the tunnel provide:-

- rail connections to the C2C services from Pitsea, the Southend Victoria services at Wickford and the Crossrail services at Shenfield
- a new chord at Shenfield to the Great Eastern Main Line
- road connection to the A13/A130 at Sadler's Hall Farm
- access to a new Southend Park-and-Ride bus service between Southend Eastern Esplanade and Leigh-on-Sea via the Pier, Western Esplanade, Chalkwell Esplanade and a new Leigh Esplanade that replaces the existing C2C tracks

Southern Portal Connections

The southern portal of the tunnel provides:-

- rail connection to the Isle of Grain Line, which is twin-tracked
- a new chord to the North Kent Line and Southeastern network services at Strood
- road connection to the A228/A229/A2

2.5 Data Storage and Utilities

The Metrotidal Lower Thames Pool system generates and stores energy by moving large volumes of seawater between the pool and the sea. Data storage centres require reliable, sustainable energy supplies and efficient cooling systems. Modern Tier 4 centres secure alternative energy supplies for resilience and aim to achieve the lowest power usage effectiveness (PUE: total facility energy divided by the IT equipment energy). Data storage centres also require substantial cooling loads to maintain a steady-state environment for the IT equipment.

The seawater of the Thames Estuary maintains uniform temperatures throughout the year, suitable for providing a steady-state environment for the IT equipment and since the sustainable energy system moves large volumes of sea water this can be used to serve the cooling loads of the data centre, thereby achieving an exceptionally low PUE. The range of sustainable energy supplies used for pumping the pool provides additional resilience for the data centre supplies. The transport connections from the portals provide utility wayleaves for distributing the data across the enabling development.

Utilities

Several existing utilities have key network connections that pass under the estuary not far from the line of the proposed tunnel. The immersed-tube tunnel cross-section includes passages for utilities with the benefit of access for maintenance and renewal. The transport corridors north and south of the tunnel provide routes for extending and connecting existing utility networks across the Thames Estuary region. The utility way leaves (broadband, communications, electricity, gas, mains water and other private-sector services) contribute to tunnel revenues.

The Hoo Peninsula in Kent is one of the driest areas of the country and has a distant fresh water supply, pumped from the Medway Valley. The Lower Thames Tunnel opens a new

water supply grid connection between South Essex and North Kent to provide a more resilient service with less pumping.

2.6 Tunnel Transport Services

The Lower Thames Tunnel provides the following new rail and road services:-

Crossrail Plus: The eastern limbs of Crossrail, to Shenfield in Essex and Abbey Wood in Kent, are linked to create the “Crossrail Plus” orbital system serving the Greater Thames Estuary and Central London. The new orbital rail route reconnects populations north and south of the Thames with existing and new stations becoming the foci for commercial and residential development. Crossrail Plus connects with HS1 at Stratford and Ebbsfleet thereby providing convenient connectivity to Northern Europe without requiring access into Central London.

Pitsea-Isle-of-Grain-Strood Shuttle: A rail shuttle service links the South Essex conurbation and the Medway Towns, with terminals at Pitsea, the Isle-of-Grain and Strood. The shuttle interconnects with Crossrail Plus at South Benfleet, Leigh-on-Sea, Allhallows-on-Sea, Stoke Harbour, Cliffe and Higham, the C2C services at Pitsea and the Southeastern Network at Strood.

Rail freight services: A rail-freight bypass to the east of London, via the new chord at Shenfield, opens a new long distance freight route between the Haven Ports, Thames Estuary and Channel Tunnel.

Road connections: The highway between the A13/A130 at Sadlers Hall Farm and the A228/A289 on the Hoo. A road-freight route between the Channel Ports and the eastern seaboard ports north and south of the Thames that avoids the congested M25/Dartford Crossing.

Southend Park-and-Ride: a new shuttle bus service between Southend Eastern Esplanade and Leigh-on-Sea Station Carpark via the Pier, Western Esplanade, Chalkwell Esplanade and a new Leigh Esplanade that replaces the existing C2C tracks

2.7 Enabling Development

Residential Development: Growth-zones for a projected 250,000 homes, including the Shelter Wolfson Prize 2014 Housing Scheme on the Hoo Peninsula, served by the stations of the Crossrail Plus orbital, the Pitsea-Isle-of-Grain-Strood Shuttle and the adjoining C2C and Southeastern networks.

Commercial Development: Office developments served by the stations of the Crossrail Plus orbital, the Pitsea-Isle-of-Grain-Strood Shuttle and the adjoining C2C and Southeastern networks.

Industrial Development: New industrial development on existing sites at the London Gateway Port, Basildon, Canvey Island, Isle-of-Grain, Kingsnorth, Hoo Junction and the Medway City Estate with convenient employee access provided by the Crossrail Plus orbital, Pitsea-Isle-of-Grain-Strood shuttle and the adjoining C2C and Southeastern networks.

Benfleet Esplanade: The existing station and rail tracks through Benfleet are replaced by a new 4-platform station and underpass beneath Benfleet Esplanade accompanied by commercial and residential development that restores South Benfleet to Benfleet-on-Sea.

Leigh Esplanade: The existing station and rail tracks through Leigh-on-Sea are replaced by a new 4-platform station and underpass beneath the existing station car park. This becomes the terminus of Leigh Esplanade, which runs on the line of the existing tracks through Leigh-

on-Sea to Chalkwell, accompanied by commercial and residential development that restores Leigh to being On-Sea.

Southend Park-and-Ride: Mixed use commercial development over the new station and underpass at Leigh-on-Sea to receive visitors arriving via the tunnel and its connections and distribute them to the attractions of the Southend seafront via the Southend-Park-and-Ride service. Along with the enhanced rail access Leigh-on-Sea becomes a principal portal for visitors to the Southend conurbation thereby easing traffic on the notoriously congested A13 and A127 arteries.

2.8 Environmental Benefits

The environmental impact of the pool is assessed in terms of the impacts on intertidal and low-lying freshwater habitats. The area of the pool occupied by the St. Mary's Marshes is already identified for managed retreat by the current TE2100 programme. The impact on the remaining intertidal area occupied by the pool are offset by the benefits from protecting intertidal areas upstream from tidal squeeze and large areas of low-lying freshwater habits from a storm surge. When the zero-carbon energy generated and stored by the system is taken into account the net environmental assessment is beneficial.

2.9 Green-Growth

The integrated infrastructure provides economic growth without an associated increase in carbon audit. This green-growth is achieved through the integration of a flood defence system with a sustainable power plant that generates and stores zero-carbon energy for supply-on-demand. This offsets the energy demands of the new transport infrastructure and enabling development. The sustainable pool system includes energy-efficient data storage and distribution with an exceptionally low power usage effectiveness (PUE) and new utility

wayleaves that serve the enabling development. The result is full-spectrum enabling development in which housing, employment, energy, transport, data and utilities are fully integrated to generate green-growth benefits across the Greater Thames Estuary region.

2.10 Agglomeration Benefits

New transport infrastructure creates an agglomeration benefit if the group economy exceeds the sum of the separate economies and the cost of the new transport links. Traditional agglomeration operates radially drawing satellite settlements into an ever expanding urban nucleus.

The economic history of London can be seen as a series of agglomeration benefits, first arising from London Bridge agglomerating the trade route of the Thames with a radial Roman road network, accelerated by development of the regions, expanding sea trade, subsequent bridges, docks, warehouses and offices, all in turn rapidly increasing the urban economy and drawing in yet more investment. After WW2 the relocation of the port and trade from the Thames Estuary led to the contraction and separation of the economies in Essex and Kent. The Thames Estuary, for centuries the main artery of trade uniting the region into a single riparian economy from Central London to the coast had become a barrier to growth. As a result there are latent agglomeration benefits to be realised simply by re-uniting the economies north and south of the Thames through improved transport infrastructure. A relatively modest investment in new connectivity provides a large agglomeration benefit across the Greater Thames Estuary region. The Metrotidal Lower Thames Pool provides the new connectivity and enabling development, placing emphasis on orbital connectivity rather than extending existing radials. The congestion of Inner London arteries is avoided while full use is made of the counter-cyclical commuting capacity, providing greater transport capacity for lower cost, thereby increasing the agglomeration benefits.

METROTIDAL

LOWER THAMES POOL

MARCH 2016

INTEGRATION BENEFITS

Flood Defence



Sustainable Energy Storage



Integrated Transport



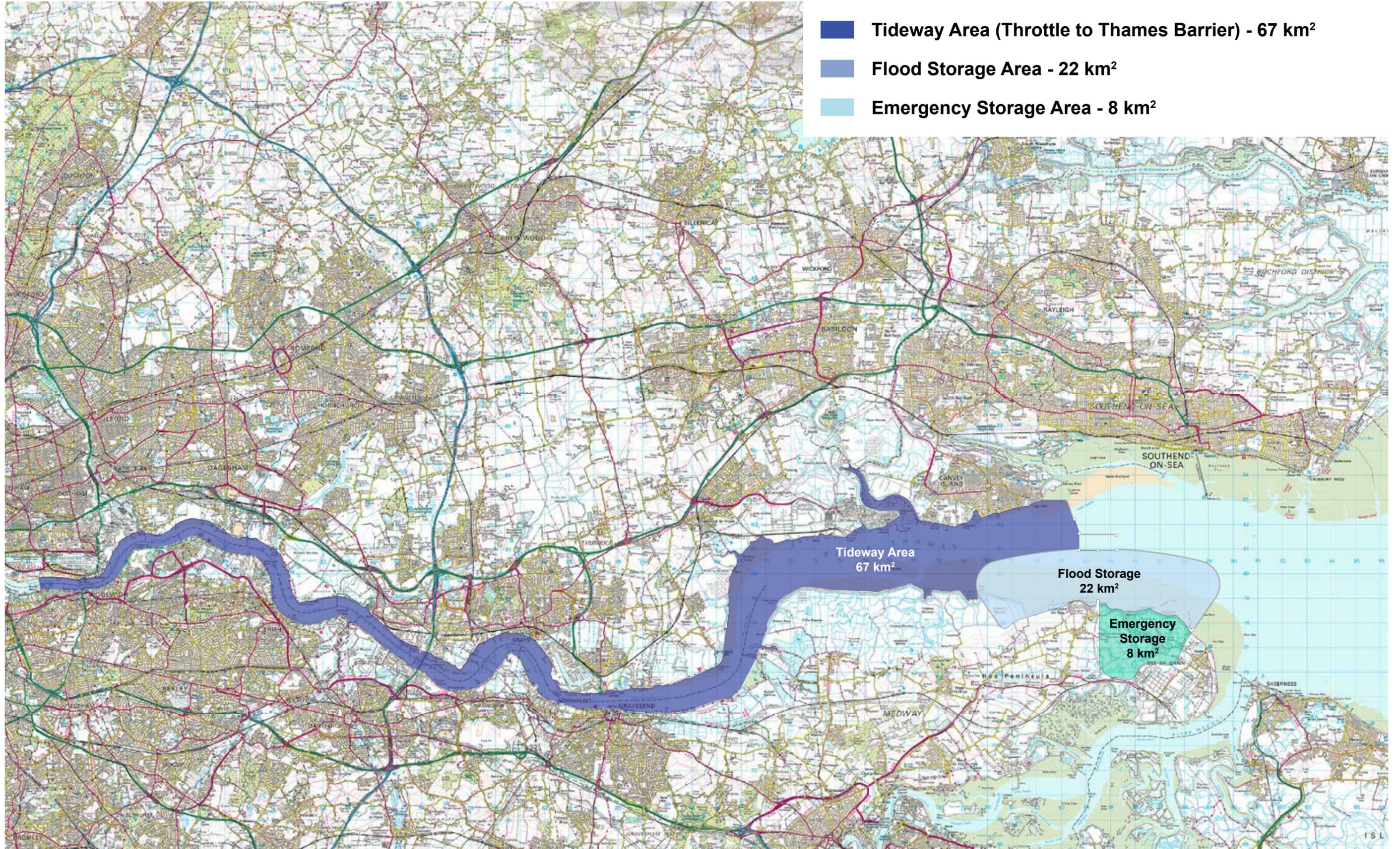
Data Storage and Utilities



Enabling Development

FLOOD DEFENCE

FLOOD STORAGE



SUSTAINABLE ENERGY STORAGE

SOLAR / WIND / TIDAL PUMPED STORAGE



INTEGRATED TRANSPORT

CROSSRAIL PLUS

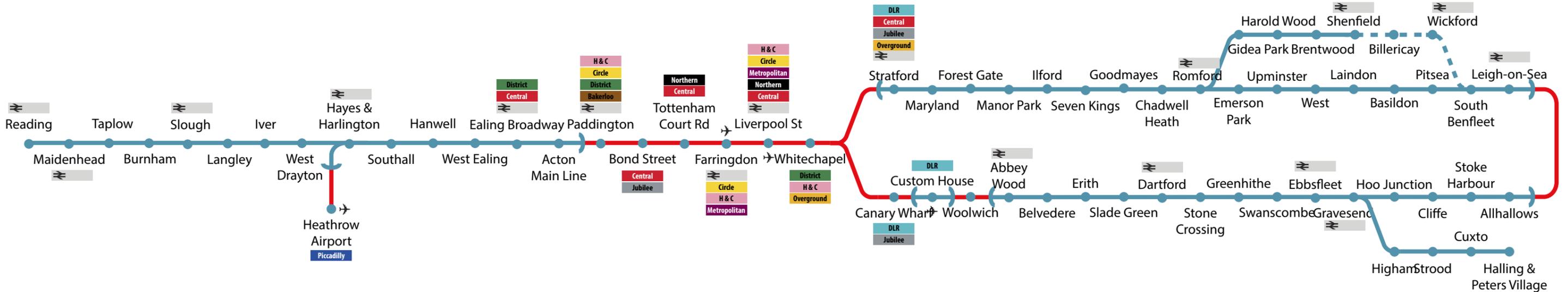


Crossrail

Route Map

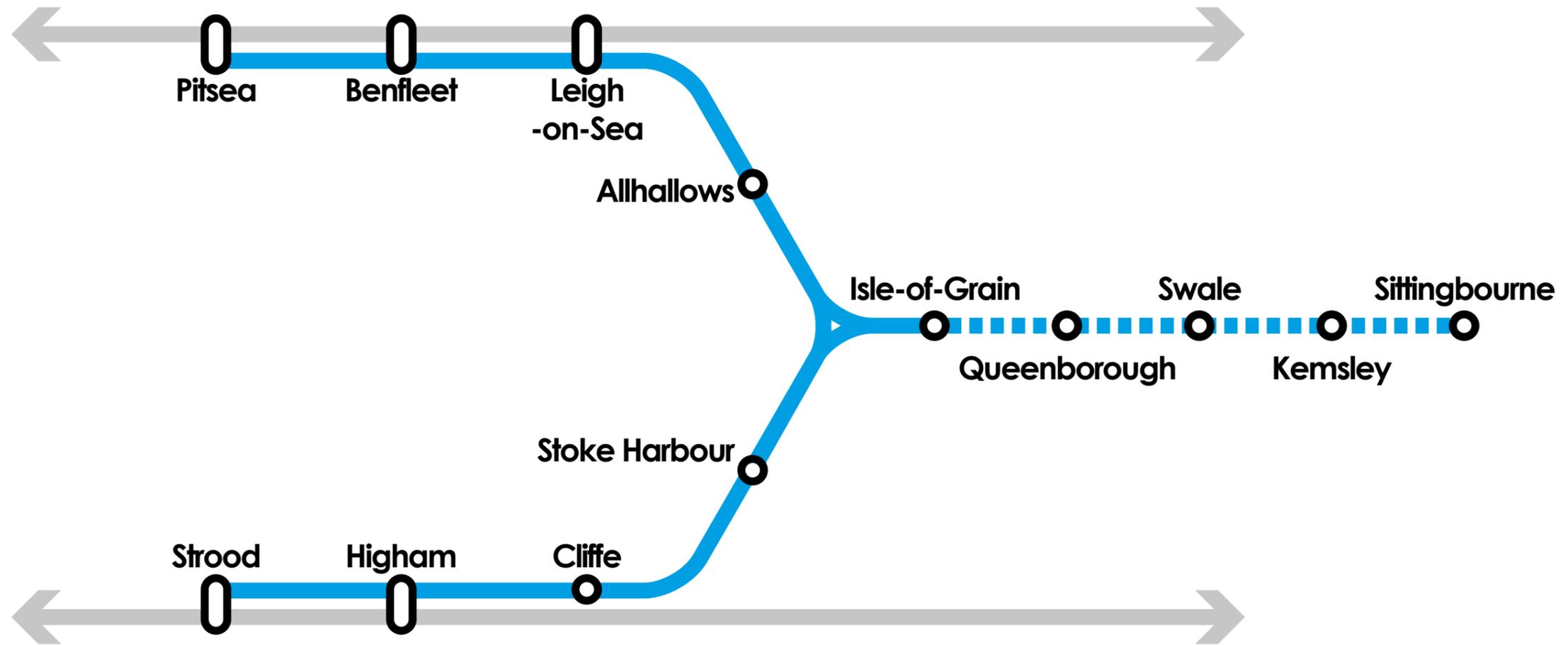


Route Connections Map



INTEGRATED TRANSPORT

PITSEA – ISLE-OF-GRAIN – STROOD SHUTTLE



INTEGRATED TRANSPORT

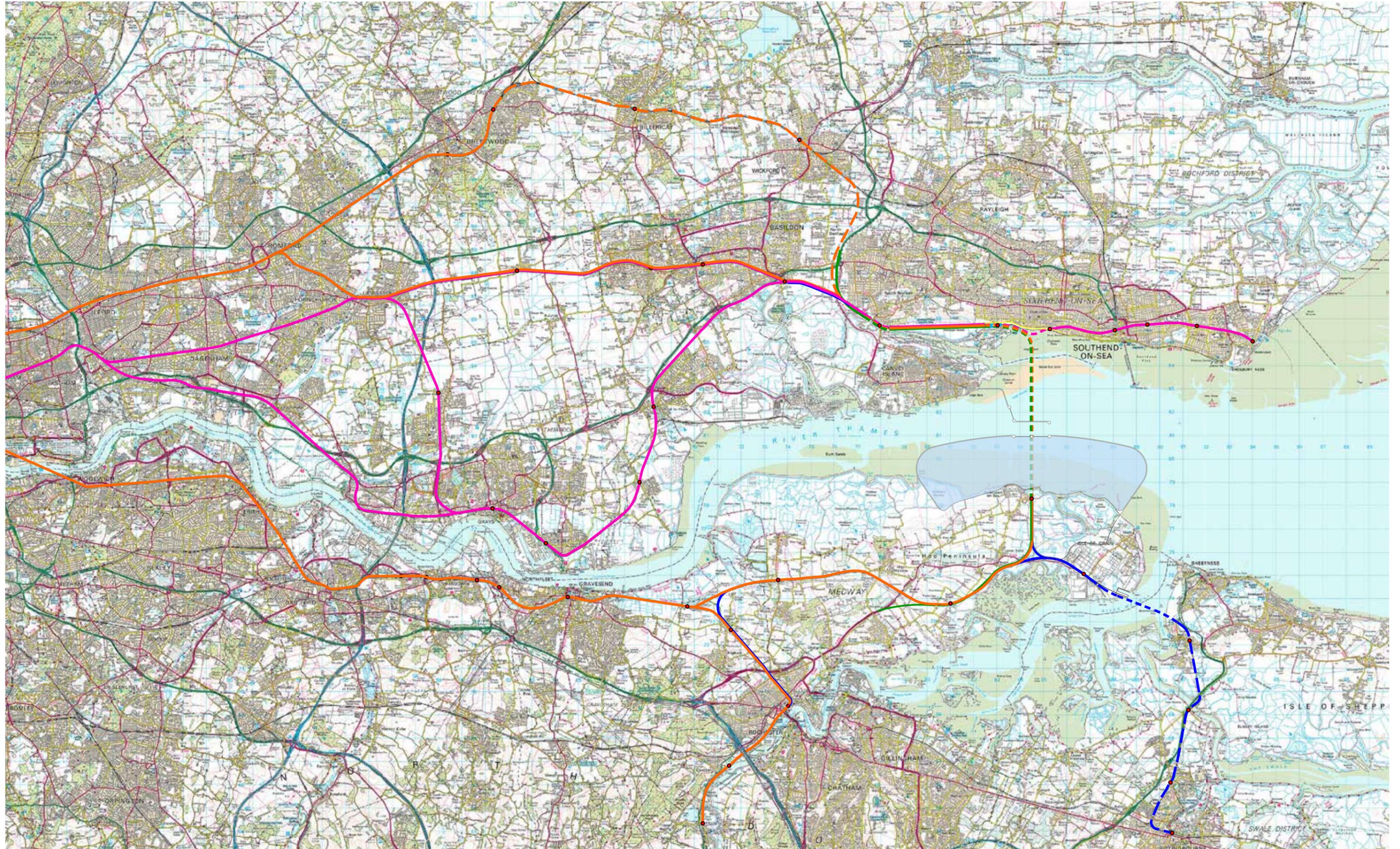
RAIL AND ROAD CONNECTIONS

RAIL CONNECTIONS

- CROSSRAIL PLUS
- PITSEA – ISLE-OF-GRAIN – STROOD SHUTTLE
- C2C
- HIGH SPEED 1

ROAD CONNECTIONS

- A13/A130 – A228/A289
- LEIGH ESPLANADE – CHALKWELL ESPLANADE



INTEGRATED TRANSPORT

RAIL AND ROAD CONNECTIONS

RAIL CONNECTIONS

- CROSSRAIL PLUS
- PITSEA – ISLE-OF-GRAIN – STROOD SHUTTLE
- C2C
- HIGH SPEED 1

ROAD CONNECTIONS

- A13/A130 – A228/A289
- LEIGH ESPLANAGE – CHALKWELL ESPLANADE

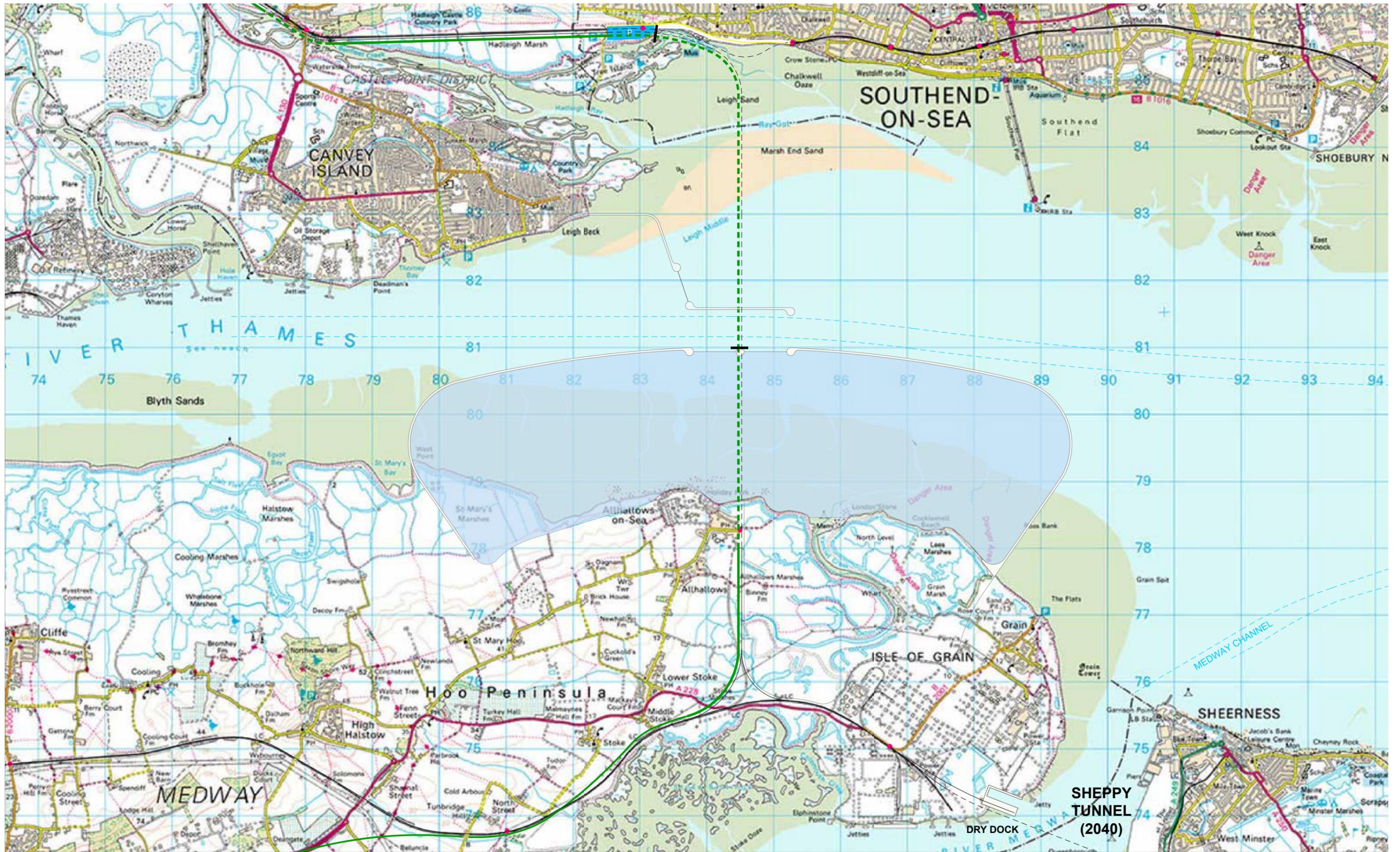


REGIONAL ROAD CONNECTIONS

-  MOTORWAYS
-  MAIN ROADS
-  METROTIDAL LINKS



TUNNEL CONSTRUCTION



TUNNEL CONSTRUCTION

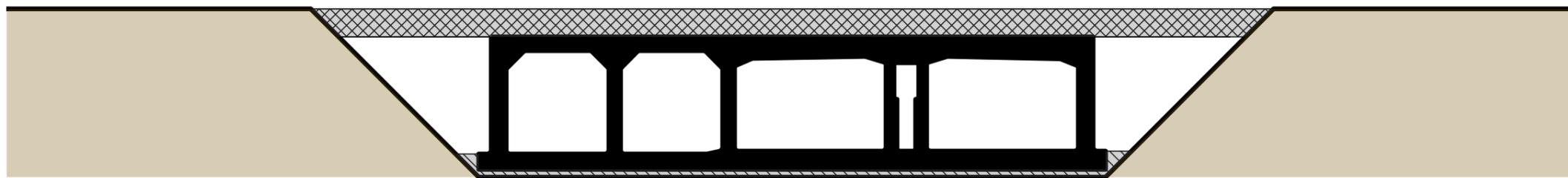
SHORTER TUNNEL OPTION



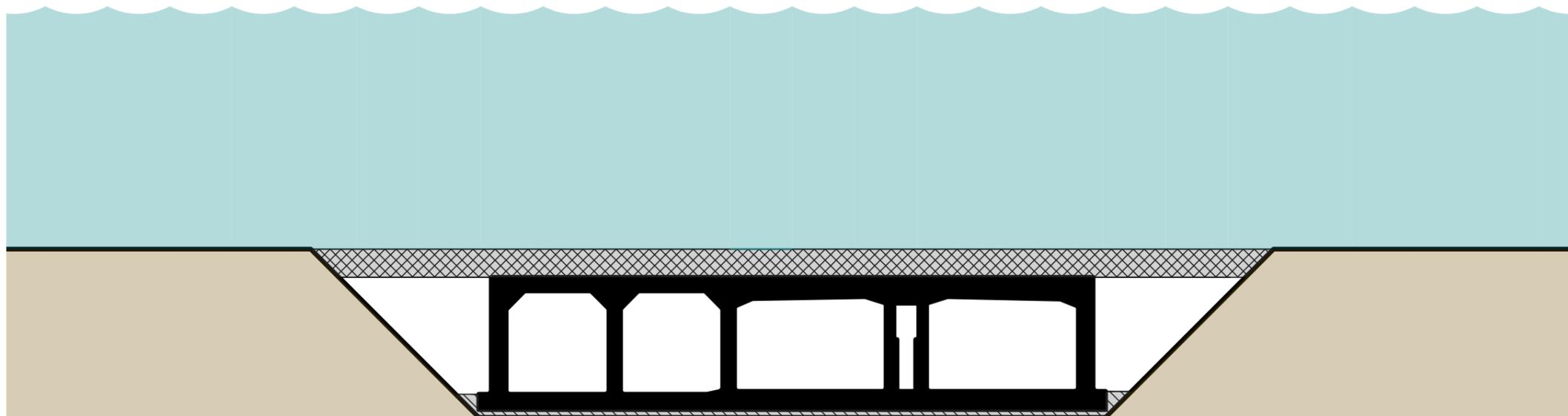
D2T2 IMMERSED TUBE TUNNEL



OPEN-CUT TUNNEL APPROACHES

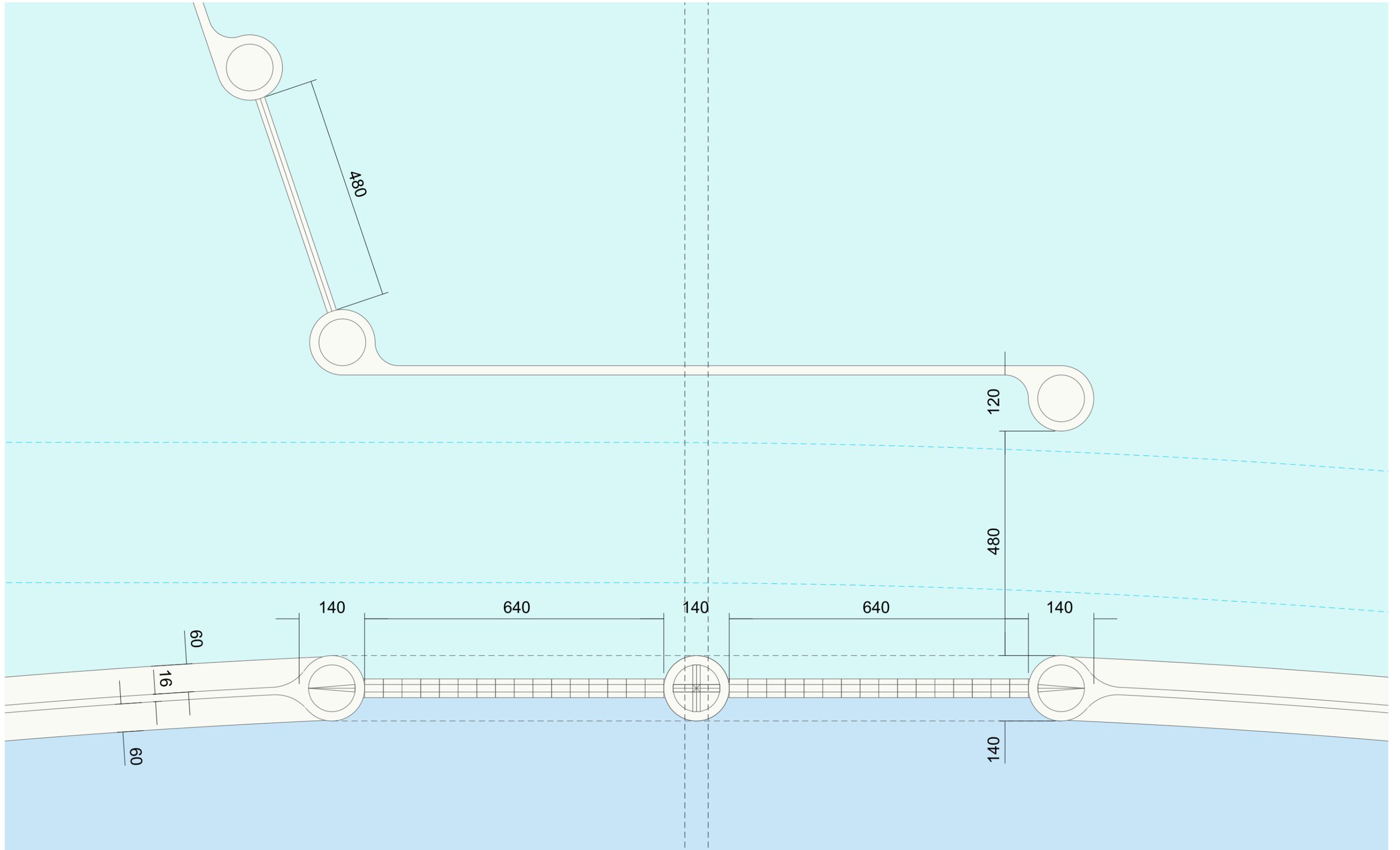


CUT-AND-COVER ACROSS INTERTIDAL AREAS



CUT-AND-COVER UNDER RIVER

THROTTLE DETAIL



DATA STORAGE AND UTILITIES

INFRASTRUCTURE UTILITY WAYLEAVES

 DATA STORAGE

 DISTRIBUTION



ENABLING DEVELOPMENT

STATION-FOCUS GROWTH ZONES



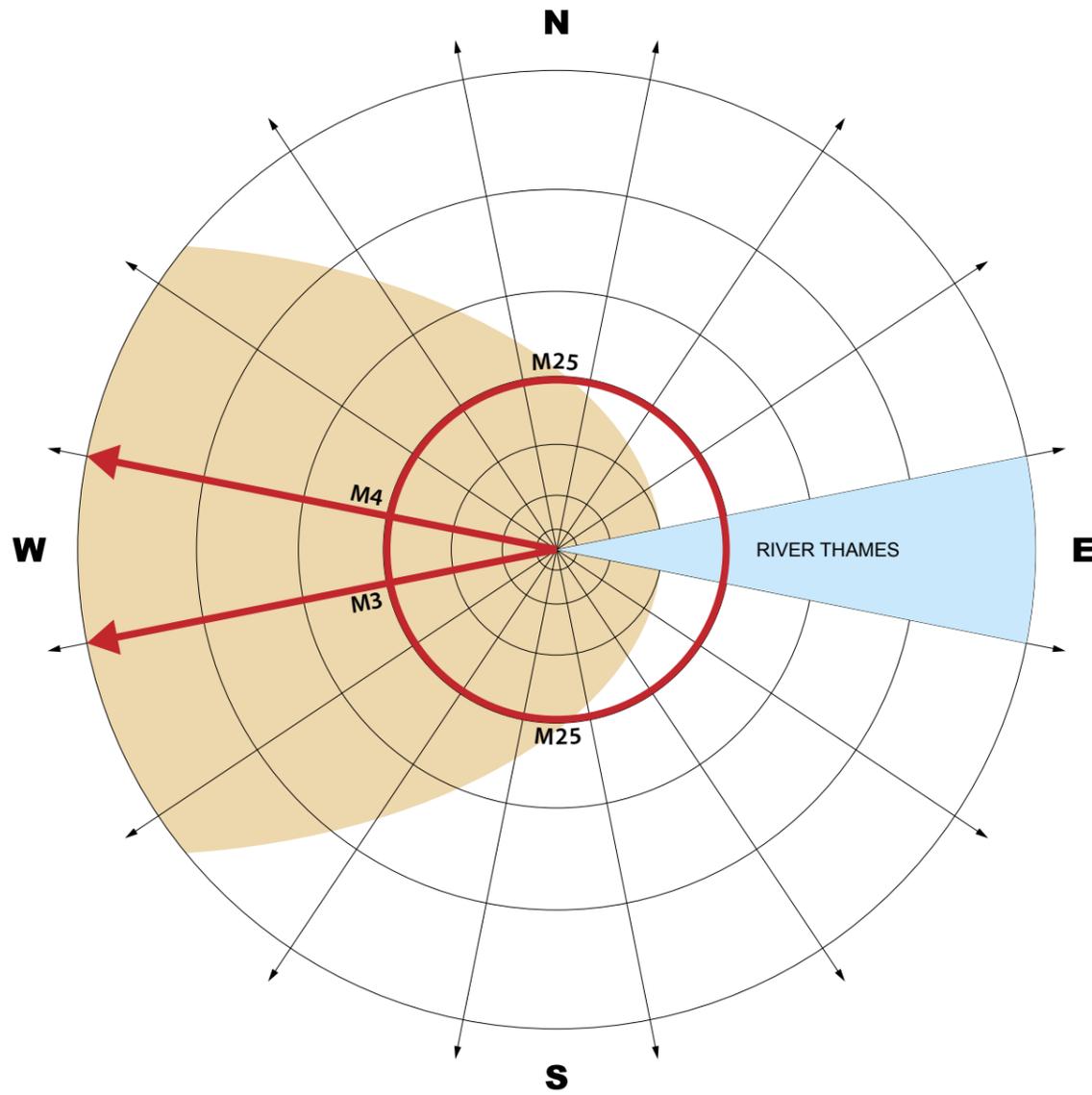
STOKE HARBOUR MASTERPLAN – HOO PENINSULA

SHELTER WOLFSON ECONOMICS PRIZE 2014 HOUSING SCHEME

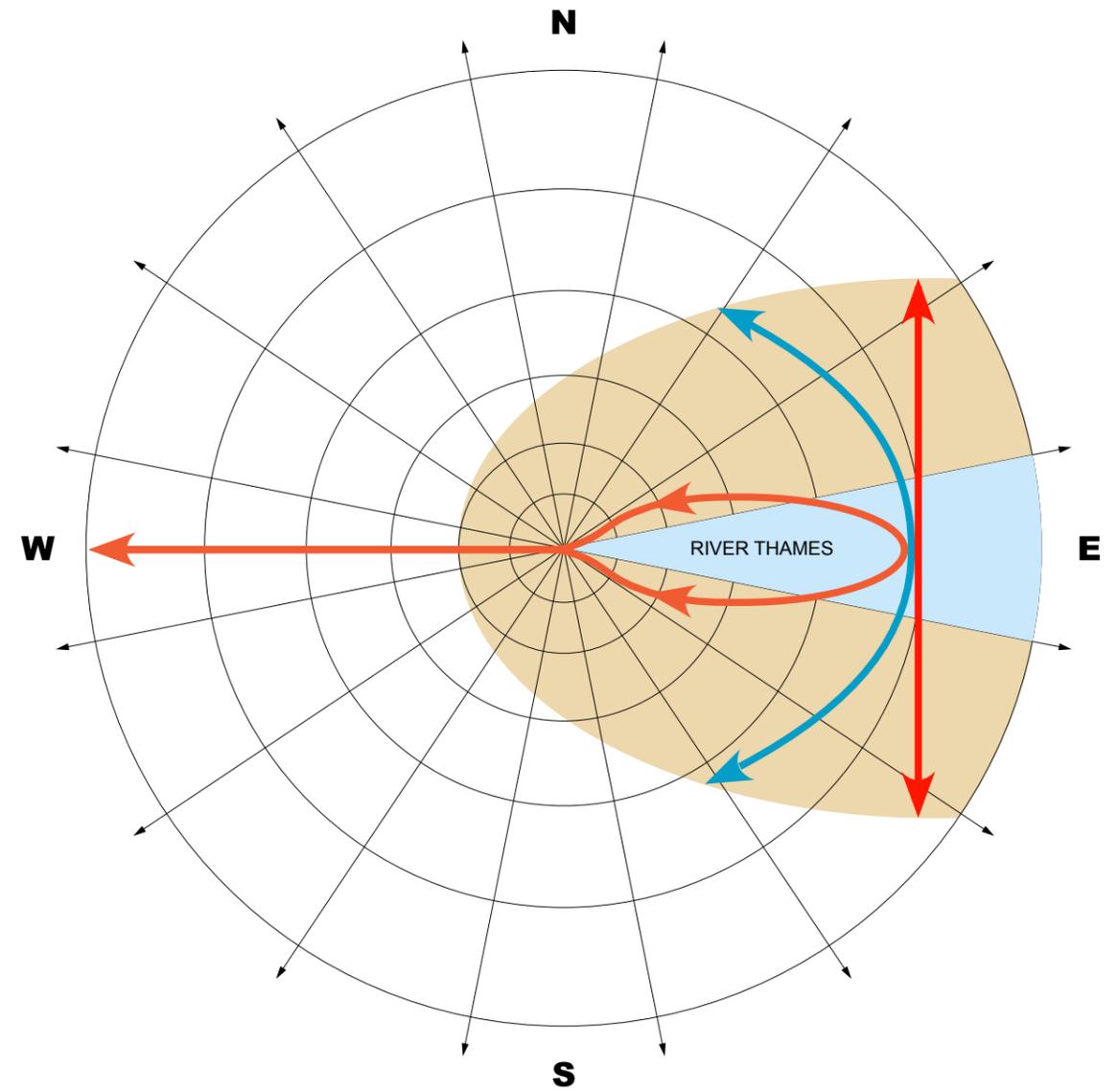


AGGLOMERATION BENEFITS

TRANSPORT NETWORKS AND GROWTH AREAS FOR LONDON



HISTORIC SYSTEM
GROWTH IN THE WEST



PROPOSED ADDITION
GROWTH IN THE EAST

CONTENTS

- 1 Introduction and Executive Summary**

- 2 The Metrotidal Agenda**
 - 2.1 Integration Benefits
 - 2.2 Flood Defence
 - 2.3 Sustainable Energy Storage
 - 2.4 Lower Thames Tunnel and Sheppey Tunnel
 - 2.5 Tunnel Connections
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1 INTRODUCTION AND EXECUTIVE SUMMARY

Metrotidal Lower Thames Pool integrates new flood defences for London with energy storage, a multi-modal tunnel, data storage, utility wayleaves and enabling development for over 250,000 homes with corresponding employment. The integrated infrastructure provides economic growth without an associated increase in carbon audit. This green-growth is achieved through the integration of a flood defence system with a sustainable power plant that generates and stores zero-carbon energy for supply on demand. The sustainable energy offsets the demands of the new transport connectivity, led by rail, and the enabling development. The pool system includes energy-efficient data storage and distribution with an exceptionally low power usage effectiveness (PUE) and new utility wayleaves that serve the enabling development. The proposals also result in the construction of a valuable new deep-water dry dock on the Isle of Grain that is used to cast the Metrotidal Tunnel sections and the subsequent sections for the Sheppey Tunnel c2040.

The result is full-spectrum enabling development in which housing, employment, energy, transport, data, utilities and marine services are co-ordinated to generate green-growth benefits across the Greater Thames Estuary.

2 THE METROTIDAL LOWER THAMES POOL AGENDA

2.1 Integration Benefits

The combination of the separate initiatives into a single, well-integrated infrastructure project reduces the planning overheads, construction costs and environmental impacts while increasing the net economic benefits. Substantial integration benefits are realised by combining separate components for flood defence, sustainable energy storage, multimodal tunnel, data storage and utilities into an orbital network that supports growth across the Greater Thames Estuary region.

2.2 Flood defence

The Metrotidal agenda provides a new system of flood defence to protect London and the Thames Estuary from surge tides through to the 22nd century. The defences are provided in the form of a throttle working in tandem with flood storage capacity to reduce the level of an incoming surge tide. The throttle is located on the shipping channel and the associated flood storage is provided by a pool beside the Hoo Peninsula, with additional emergency capacity across the marshes to the Isle of Grain.

The throttle has a weir with deep-water flood sluices that admit water to the pool during an incoming surge and return it to the sea on the ebb tide. Existing monitoring systems provide over 24 hours' advance-warning of the storm surge. This allows the pool to be drained during the preceding low tide and the flood sluices closed to reserve the maximum flood storage capacity ahead of the surge tide. The variables of the incoming surge waveform and duration are recorded and analysed as the tide advances down the North Sea coast, enabling the most effective use of the available flood storage in the pool to be programmed before the storm surge arrives in the Thames Estuary. The level of the weir and area of the flood sluices are then controlled to suit the programme. If additional flood storage is required in an emergency a weir and flood sluices from the pool allow controlled flooding of the marshes beside the Isle of Grain.

The system is designed to allow the free movement of normal tides while restricting and limiting the incoming storm surge. The throttle and flood storage capacity of the pool then works in tandem with the capacity of the tideway upstream and the existing Thames Barrier to reduce the incoming peak surge. Accordingly, the system protects all the flood risk areas upstream from the throttle including the metropolitan areas and the existing fresh water habitats that remain at risk in the event of a surge tide under the current TE2100 proposals.

The flood defence proposals replace those of the TE2100 programme for which current budget is £1.5bn by 2034. The flood risk to very substantial property, infrastructure and habitat assets upstream is reduced, enabling the Association of British Insurers (ABI) to redirect a proportion of the premia raised under the new Flood Re agreement towards funding the flood storage system, so that government expenditure for the flood defence component will be less than the current £1.5bn budget. The flood storage pool impoundment doubles as a sustainable energy storage system and reduces the construction cost of the multimodal tunnel, consequently increasing the net economic benefits of the integrated system. The resultant net economic benefits are much higher than for the TE2100 investment programme, which addresses only the flood risks.

2.3 Sustainable Energy Storage

The Metrotidal agenda integrates flood storage and tidal power within the same impoundment, enabling the range within the impoundment to be pumped to treble the natural tidal range within the estuary. This allows the tidal power plant to increase peak output when required or store energy in the pool for delivery on demand. The energy for the pumping is provided by solar, wind and tidal power along with the forthcoming option of nuclear power from Bradwell in Essex. The solar energy is provided by floating arrays within the protection of the impoundment that generate up to 50MW per sq.km. The wind energy is provided from the London Array in the outer estuary and the tidal energy from the natural range at the throttle in the Thames generating power through turbines below the flood weir.

The combined solar, wind and tidal pumped-storage system can deliver sufficient energy to offset the energy demands of the multimodal tunnel and new rail systems, leaving surplus energy to be sold to the grid.

2.4 Lower Thames Tunnel and Sheppey Tunnel

The Metrotidal agenda includes a multimodal, D2T2 Lower Thames Tunnel formed from a combination of cut-and-cover and immersed tube tunnel construction techniques. The costs are reduced by maximising the proportion of cut-and-cover and minimising the length of the immersed-tube construction. For a Lower Thames Tunnel running between Leigh-On-Sea in Essex and Allhallows-On-Sea in Kent the pool impoundment reduces the cost of the tunnel by increasing the cut-and-cover approaches and reducing the length of immersed-tube tunnel across the remaining open tideway. The immersed tube tunnel sections are formed in a casting basin on the Isle of Grain, towed into position and sunk into a prepared trench across the open estuary. There is sufficient width in Sea Reach to maintain port operations during the immersed tube tunnel construction. The casting basin subsequently becomes a deep-water dry-dock to service shipping on the Thames and Medway Estuaries and provides the facility to cast the sections for the Sheppey Tunnel 2040.

The multimodal Lower Thames Tunnel completes a Crossrail Plus rail orbital and a highways outer orbital that together provide relief for the M25/Dartford Crossing and serve substantial growth across the Greater Thames Estuary region. On the north bank alternative Crossrail Plus orbitals can be completed via the C2C Basildon Line or the Southend Victoria Line to Crossrail at Shenfield. The rapid growth in population from Central London east along the Thames Estuary places priority on increasing capacity closer to the river hence the C2C route via Basildon is proposed as the initial orbital with the Shenfield orbital a subsequent option c2040.

2.5 Lower Thames Tunnel Connections

North Portal Connections

- new twin tracks alongside the C2C line from Leigh-on-Sea to Upminster, and dualling of the Upminster to Romford line for the extension of Crossrail services from Romford
- a subsequent option of a new connection from South Benfleet to Wickford and new twin tracks alongside the Southend Victoria services to Shenfield for the extension of Crossrail services from Shenfield
- a new passenger and freight chord at Shenfield to the Great Eastern Main Line
- road connection to the A13/A130 at Sadler's Hall Farm
- access to a new Southend Park-and-Ride bus service between Southend Eastern Esplanade and Leigh-On-Sea via the Pier, Western Esplanade, Chalkwell Esplanade and a new Leigh Esplanade that replaces the existing C2C tracks

South Portal Connections

- twin-track rail connection to the Isle of Grain Line, which is dualled from Lower Stoke to Hoo Junction for the extension of Crossrail services from Abbey Wood, with associated line improvements
- a twin-track chord from the Isle of Grain Line to the North Kent Line and Southeastern network services at Strood
- road connection to the A228/A229/A2
- rail connection to Sittingbourne and road connection to the A249 following construction of the Sheppey Tunnel 2040

2.6 Data Storage and Utilities

The Metrotidal Lower Thames Pool system generates and stores energy by moving large volumes of cool seawater between the pool and the sea. Data storage centres require reliable, sustainable energy supplies and efficient cooling systems. Modern Tier 4 centres secure alternative energy supplies for resilience and aim to achieve the lowest power usage effectiveness (PUE: total facility energy divided by the IT equipment energy). Data storage centres also require substantial cooling loads to maintain a steady-state environment for the IT equipment.

The seawater of the Thames Estuary maintains uniform temperatures throughout the year, suitable for providing a steady-state environment for the IT equipment and since the sustainable energy system moves large volumes of sea water this can be used to serve the cooling loads of the data centre, thereby achieving an exceptionally low PUE. The wide range of sustainable energy supplies used for pumping the pool provides additional resilience for the data centre supplies. The transport connections from the tunnel portals provide utility wayleaves for distributing the data across to the enabling developments across the Great Thames Estuary region.

Several existing utilities have key network connections that pass under the estuary not far from the line of the proposed tunnel. The immersed-tube tunnel cross-section includes passages for utilities with the benefit of access for maintenance and renewal. The transport corridors north and south of the tunnel provide routes for extending and connecting existing utility networks across the Greater Thames Estuary region. The utility way leaves (broadband, communications, electricity, gas, mains water and other private-sector services) contribute to tunnel revenues.

The Hoo Peninsula in Kent, one of the driest areas of the country, has a distant fresh water supply, pumped from the Medway Valley. The Lower Thames Tunnel opens a new water

supply grid connection between South Essex and North Kent for a more resilient service with less pumping.

2.7 Tunnel Transport Services

Crossrail Plus: (C2C Basildon Branch) The Romford to Upminster single-track LTS Line is dualled and connected to new twin-tracks from Upminster to Leigh-on-Sea alongside the C2C Line, with 4-tracking through the stations at Upminster, West Horndon, Laindon, Basildon, Pitsea and Leigh-on-Sea, to create the Crossrail Plus orbital between Crossrail at Romford through Metrotidal Tunnel to Crossrail at Abbey Wood.

Crossrail Plus: (Shenfield Branch) The eastern limb of Crossrail to Shenfield in Essex is extended on a 4-tracked Southend Victoria Line to Wickford and a new twin-track connection to South Benfleet and so on to Leigh-on-Sea to create an alternative Crossrail Plus orbital route on the north bank from 2040, again serving the Greater Thames Estuary and Central London. Both orbital rail routes reconnect populations north and south of the Thames, with the existing and new stations becoming the foci for commercial and residential development.

Crossrail Plus connects with HS1 at Stratford and Ebbsfleet thereby providing convenient connectivity to Northern Europe without requiring access into Central London.

Crossrail Plus: (Halling & Peters Village Branch) A branch service of Crossrail Plus from Hoo Junction to Halling on the Medway Valley Line, with two additional platforms at Halling and/or Snodland providing a terminus that serves Peters Village on the east bank of the Medway

Pitsea-Isle-of-Grain-Strood Shuttle: A rail shuttle service that links the South Essex conurbation and the Medway Towns, with terminals at Pitsea, the Isle-of-Grain and Strood. The shuttle interconnects with Crossrail Plus at South Benfleet, Leigh-on-Sea, Allhallows-on-Sea, Stoke Harbour, Cliffe and Higham, the C2C services at Pitsea and the Southeastern

Network at Strood, with the option of a branch from the Isle of Grain Line via Hoo Junction and the North Kent Line to Ebbsfleet for access to the Javelin and HS1 services into Central London and the Continent. From 2040 the Isle of Grain line can be connected through the Sheppey Tunnel to extend the shuttle rail services through Queenborough, Swale and Kemsley to Sittingbourne.

Rail freight services: A rail-freight bypass to the east of London, via the new chord at Shenfield, opens a new long distance freight route between the Haven Ports, Thames Estuary and the Channel Tunnel. The Sheppey Tunnel opens an alternative freight route between Kent, the Thames Estuary and the Haven Ports.

Road connections: A new D2 highway between the A13/A130 at Sadlers Hall Farm and the A228/A289 on the Hoo, followed by a D2 connection to the A249 through a Sheppey Tunnel after 2040. The initial connection serves the enabling development across the Thames estuary region outside the M25 orbital and provides an alternative HGV road-freight route between Dover Docks and the Midlands that avoids the congested M20/M25/Dartford Crossing/M11. The current journey from Dover Docks to the A120/M11 junction northbound lane, via the A20/M20/M25/Dartford Crossing/M11 is 158km. The distance of the alternative route, via the A2/A289/A228/A130/A12/A131/A120/M11 is 179km. After the Sheppey Tunnel opens in 2040 the alternative route from Dover Docks to the Midlands via the A2/A249/A228/A130/A12/A131/A120/M11 is 163km. Improvements to the M2/A249 and A131/A120 junctions can reduce this to 158km, matching the existing journey, again without use of the M20, M25 Dartford Crossing or M11 up to the A120 junction.

Southend Park-and-Ride: a new shuttle bus service between Southend Eastern Esplanade and Leigh-on-Sea Station Carpark via the Pier, Western Esplanade, Chalkwell Esplanade and a new Leigh Esplanade that replaces the existing C2C tracks

2.8 Enabling Development

Residential Development: Growth-zones for over 250,000 homes, including the Shelter Wolfson Prize 2014 Housing Scheme on the Hoo Peninsula and Peters Village on the Medway, served by the stations of the Crossrail Plus orbital, the Pitsea-Isle-of-Grain-Strood Shuttle and the adjoining C2C and Southeastern networks.

Commercial Development: Office developments served by the stations of the Crossrail Plus orbital, the Pitsea-Isle-of-Grain-Strood Shuttle and the adjoining C2C and Southeastern networks.

Industrial Development: New industrial development on existing sites at the London Gateway Port, Basildon, Canvey Island, Isle-of-Grain, Kingsnorth, Hoo Junction, the Medway City Estate and Strood with convenient employee access provided by the Crossrail Plus orbital, Pitsea-Isle-of-Grain-Strood shuttle and the adjoining C2C and South-eastern networks. Additional connectivity for these sites, the industrial sites at Sheerness and Queenborough on the Isle of Sheppey and for the Swale, Kemsley and Sittingbourne in Kent after 2040 with the opening of the Sheppey Tunnel and the Shenfield chord.

Benfleet Esplanade: The existing station and rail tracks through Benfleet are replaced by a new 4-platform station and underpass beneath Benfleet Esplanade accompanied by commercial and residential development that restores South Benfleet to Benfleet-on-Sea.

Leigh Esplanade: The existing station and rail tracks through Leigh-on-Sea are replaced by a new 4-platform station and underpass beneath the existing station car park. This becomes the terminus of Leigh Esplanade, which runs on the line of the existing tracks through Leigh-on-Sea to Chalkwell, accompanied by commercial and residential development that restores Leigh to being on-Sea.

Southend Park-and-Ride: Mixed use commercial development over the new station and underpass at Leigh-on-Sea to receive visitors arriving via the tunnel and its connections and distribute them to the attractions of the Southend seafront via the Southend-Park-and-Ride service. Along with the enhanced rail access Leigh-on-Sea becomes a principal portal for visitors to the Southend conurbation thereby easing traffic on the notoriously congested A13 and A127 arteries.

The combination of one or more of the proposed East London Rivers Crossings upstream of the Dartford Crossing with the Metrotidal Lower Thames Pool downstream of the Dartford Crossing means that no work is required at the Dartford Crossing. The TE2100 proposals would be cancelled. Consequently, the budgets of £4.3-4.9bn for the Highways England LTC proposals and £1.5bn for the TE2100 to 2034 can be redirected to realising the Metrotidal Lower Thames Pool proposals, resulting in much higher outputs.

2.9 Counter-Cyclical Commuting-Capacity

The proposals enable the trains that would have terminated on the eastern limbs of Crossrail at Shenfield and Abbey Wood to continue around the orbital and return on the opposite sides of the estuary. The present radial configuration of Crossrail is designed to serve the diurnal radial commuting pattern into Central London, with trains running largely empty in the opposite directions during peak hours. The Crossrail Plus orbital system around the Thames estuary provides the same Central London diurnal commuter capacity but will also make full use of the counter-cyclical commuter-capacity to serve growth across the Greater Thames Estuary region. Journeys that would have run empty can now provide the rail capacity to serve settlements around the Thames Estuary without requiring journeys into Central London. Over 250,000 new homes and corresponding new employment across the Greater Thames Estuary region can be accommodated without increasing journeys into Central London.

Furthermore, the new orbital capacity will ease congestion and improve the resilience of existing radials by providing alternative routes into Central London. Basildon and the South Essex conurbation will have the option to travel south to Ebbsfleet and on to St. Pancras, while the Medway Towns can travel via the 4-tracked C2C and Great Eastern mainlines to Liverpool Street and Fenchurch Street.

2.10 Environmental Benefits

The environmental impact of the pool is assessed in terms of the impacts on intertidal and low-lying freshwater habitats. The area of St. Mary's Marshes to be occupied by the pool is already identified for managed retreat by the current TE2100 programme. The impacts on the remaining intertidal area occupied by the pool are offset by the benefits of protecting the intertidal areas upstream from tidal squeeze and from protecting large areas of low-lying freshwater habitat from a storm surge. When the zero-carbon energy generated and stored by the system is taken into account the net environmental benefits are substantial.

2.11 Green-Growth

The integrated infrastructure provides economic growth without an associated increase in carbon audit. This green-growth is achieved through the integration of a flood defence system with a sustainable power plant that generates and stores zero-carbon energy for supply on demand. The sustainable energy offsets the demands of the new transport infrastructure and the enabling development. The sustainable pool system includes energy-efficient data storage and distribution with an exceptionally low power usage effectiveness (PUE) and new utility wayleaves that serve the enabling development. The result is full-spectrum enabling development in which housing, employment, energy, transport, data and utilities are coordinated to generate green-growth benefits across the Greater Thames Estuary region.

2.12 Agglomeration Benefits

New transport infrastructure creates an agglomeration benefit if the resulting economy exceeds the sum of the separate economies and the cost of the new transport links. Traditional agglomeration operates radially drawing satellite settlements into an ever-expanding urban nucleus. The Metrotidal Lower Thames Pool generates orbital agglomeration that spreads demand and capacity more uniformly.

The economic history of London can be seen as a series of agglomeration benefits, first from the Roman Bridge agglomerating the trade routes of the Thames Estuary with a radial road network spreading inland, accelerated by development of the regions, expanding sea trade, subsequent bridges, docks, warehouses and offices, all in turn rapidly increasing the urban economy and drawing in yet more investment. After WW2 the relocation of the port and trade from the Thames Estuary led to the contraction and separation of the economies in Essex and Kent. The Thames Estuary, for centuries the main artery of trade uniting the region into a single riparian economy from Central London to the coast, had become a barrier to growth. As a result, there are latent agglomeration benefits to be realised simply by re-uniting the economies north and south of the Thames through improved transport infrastructure. A relatively modest investment in new connectivity provides a large agglomeration benefit across the Greater Thames Estuary region. The Metrotidal Lower Thames Pool provides the new connectivity and enabling development, placing emphasis on orbital connectivity rather than extending existing radials. The congestion of Inner London arteries is avoided while full use is made of the counter-cyclical commuting capacity around the orbital, providing greater transport capacity for lower cost and higher agglomeration benefits.

The integration of the multimodal transport orbitals with flood defence, sustainable energy storage, data distribution, utilities and enabling development provides green-growth across the Great Thames Estuary region.

MW/March 2016

METROTIDAL

LOWER THAMES POOL

MARCH 2016

INTEGRATION BENEFITS

Flood Defence



Sustainable Energy Storage



Integrated Transport



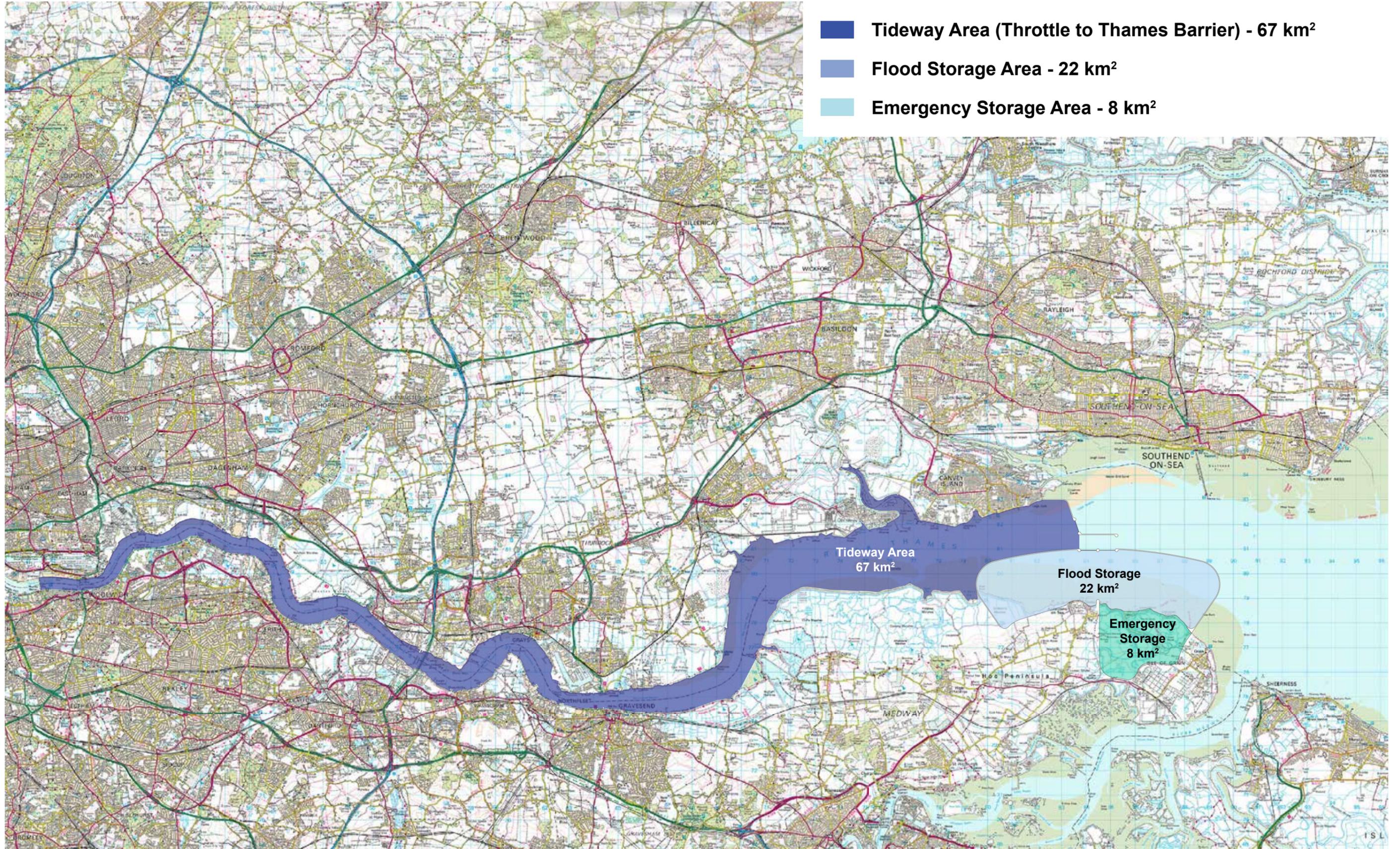
Data Storage and Utilities



Enabling Development

FLOOD DEFENCE

FLOOD STORAGE



SUSTAINABLE ENERGY STORAGE

SOLAR / WIND / TIDAL PUMPED STORAGE



INTEGRATED TRANSPORT

CROSSRAIL PLUS

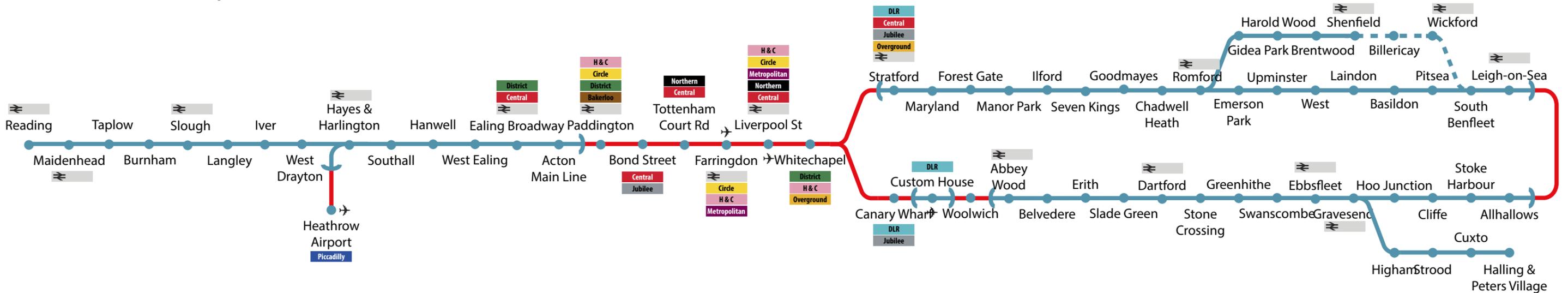


Crossrail

Route Map

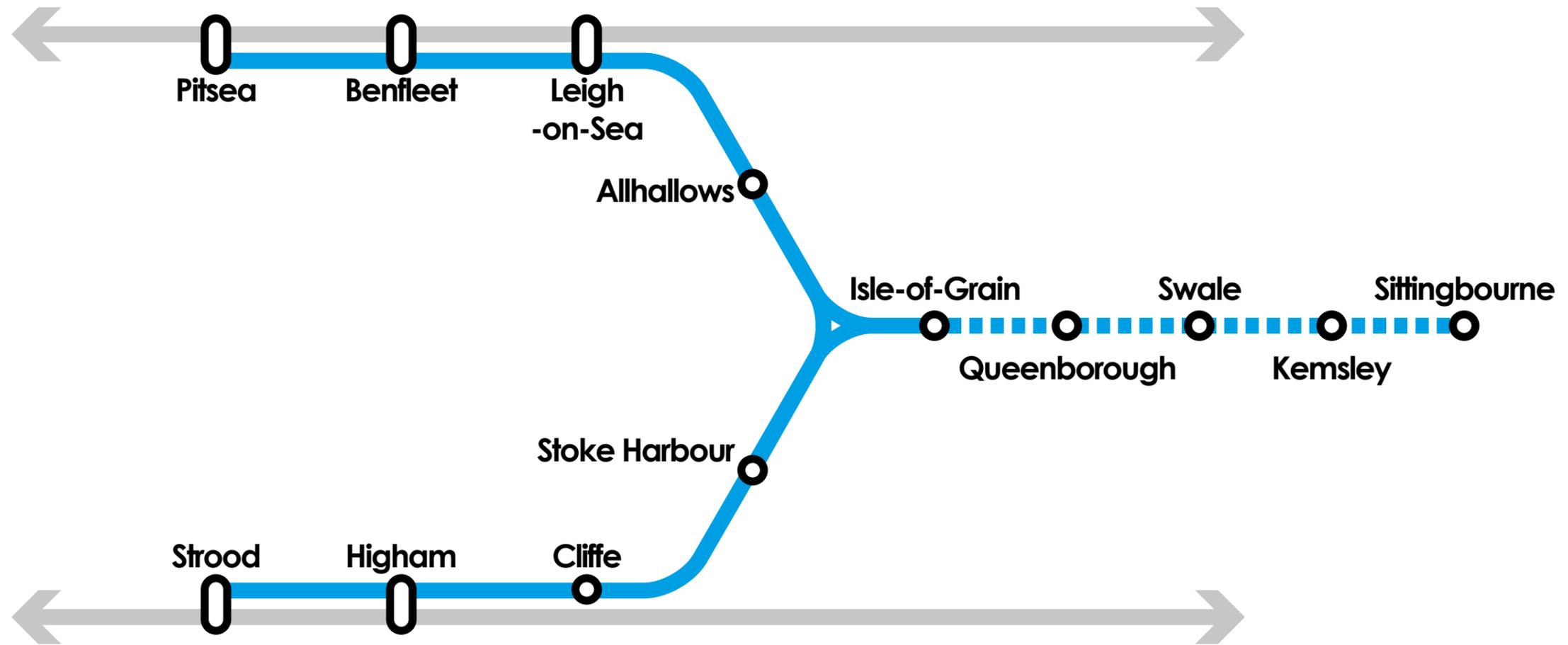


Route Connections Map



INTEGRATED TRANSPORT

PITSEA – ISLE-OF-GRAIN – STROOD SHUTTLE



INTEGRATED TRANSPORT

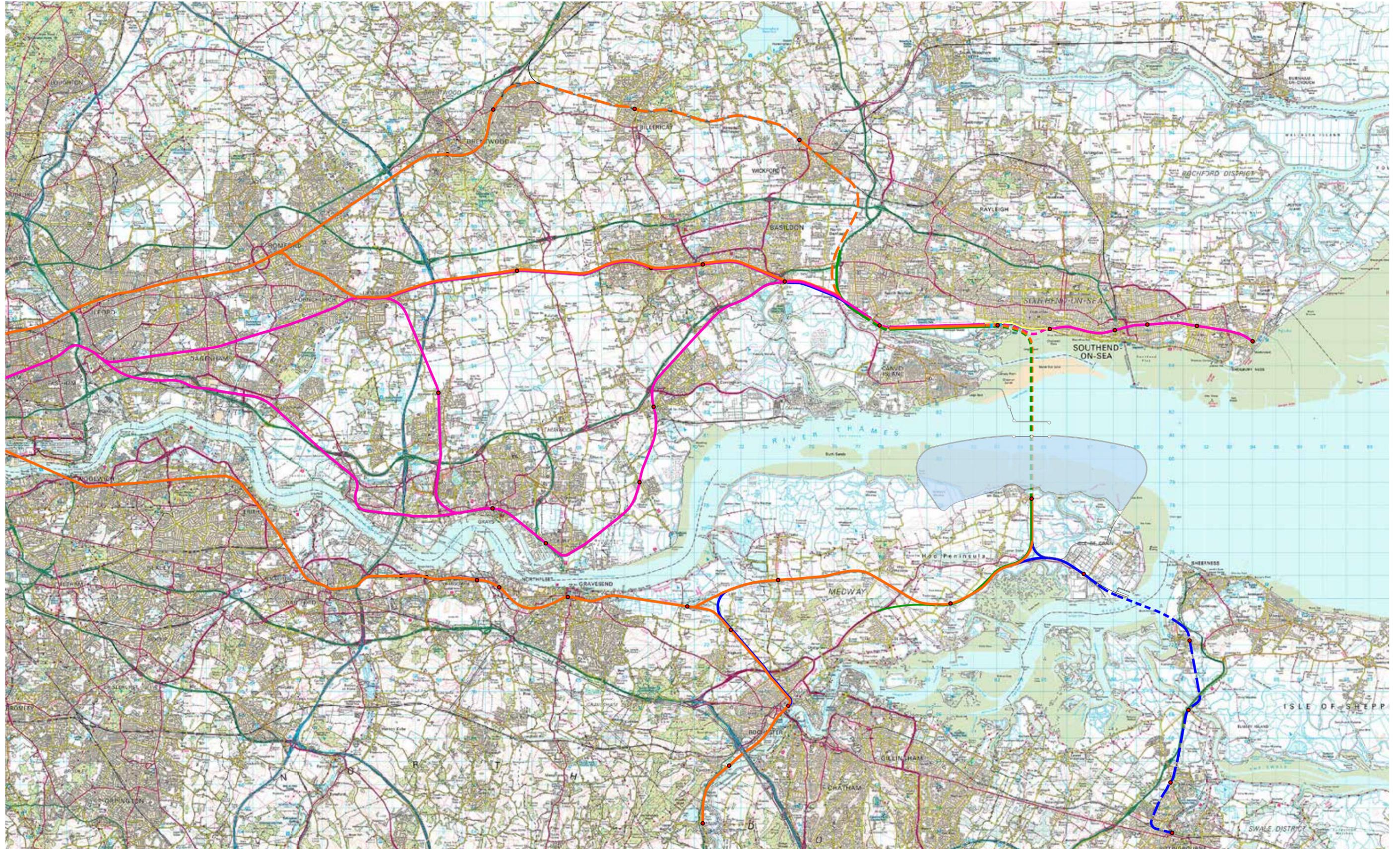
RAIL AND ROAD CONNECTIONS

RAIL CONNECTIONS

- CROSSRAIL PLUS
- PITSEA – ISLE-OF-GRAIN – STROOD SHUTTLE
- C2C
- HIGH SPEED 1

ROAD CONNECTIONS

- A13/A130 – A228/A289
- LEIGH ESPLANADE – CHALKWELL ESPLANADE



INTEGRATED TRANSPORT

RAIL AND ROAD CONNECTIONS

RAIL CONNECTIONS

- CROSSRAIL PLUS
- PITSEA – ISLE-OF-GRAIN – STROOD SHUTTLE
- C2C

ROAD CONNECTIONS

- A13/A130 – A228/A289
- LEIGH ESPLANADE – CHALKWELL ESPLANADE



REGIONAL ROAD CONNECTIONS

-  MOTORWAYS
-  MAIN ROADS
-  METROTIDAL LINKS



TUNNEL CONSTRUCTION



TUNNEL CONSTRUCTION

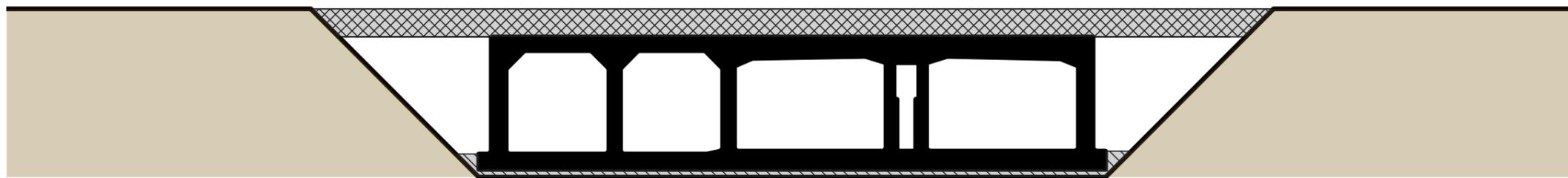
SHORTER TUNNEL OPTION



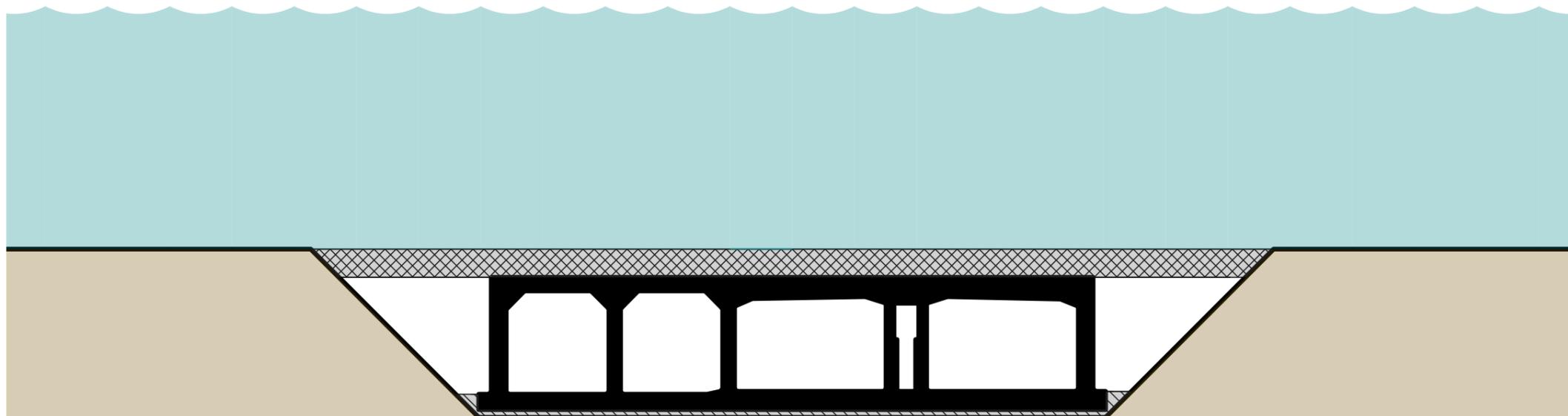
D2T2 IMMERSED TUBE TUNNEL



OPEN-CUT TUNNEL APPROACHES

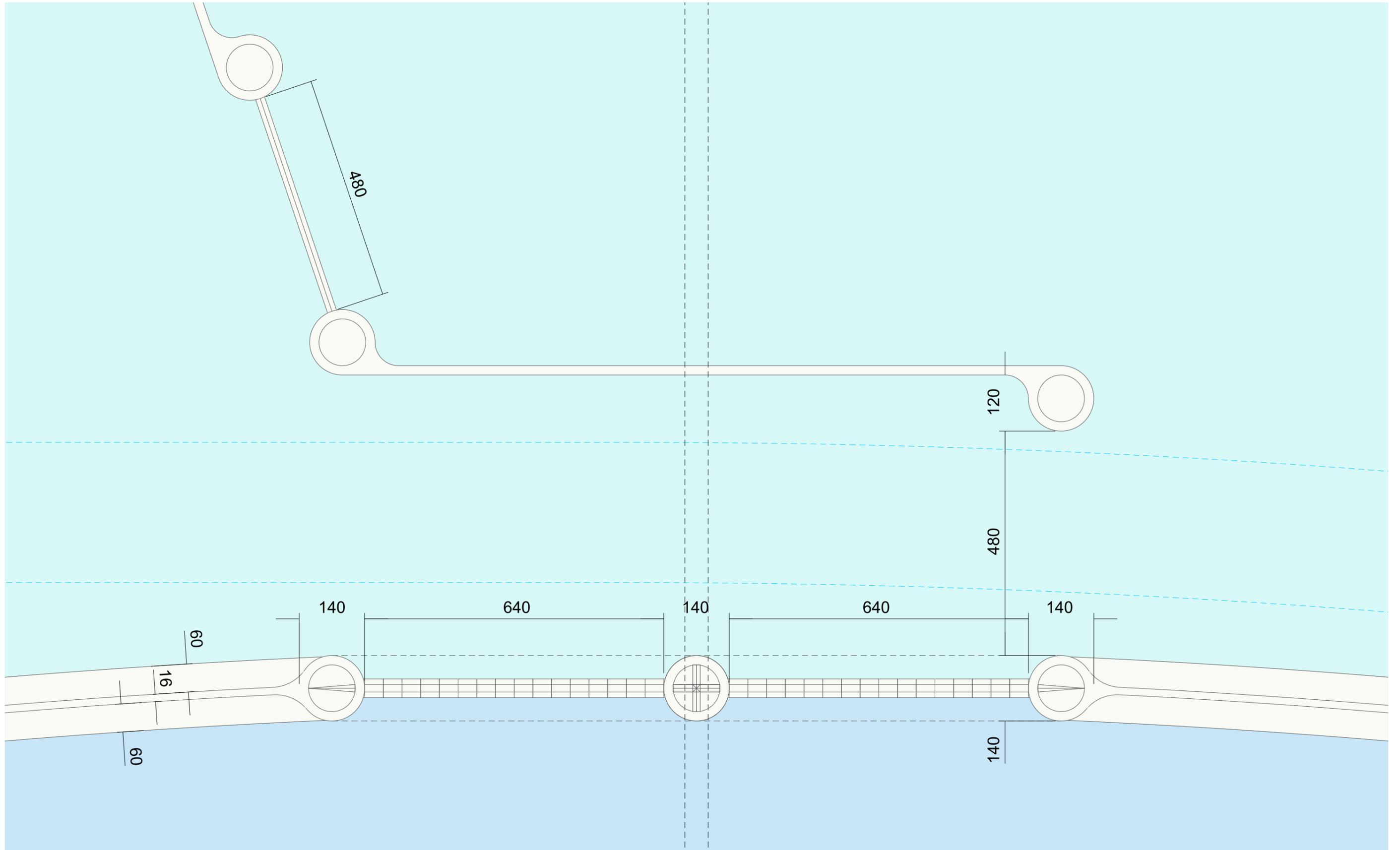


CUT-AND-COVER ACROSS INTERTIDAL AREAS



CUT-AND-COVER UNDER RIVER

THROTTLE DETAIL



DATA STORAGE AND UTILITIES

INFRASTRUCTURE UTILITY WAYLEAVES

 DATA STORAGE

 DISTRIBUTION



ENABLING DEVELOPMENT

STATION-FOCUS GROWTH ZONES



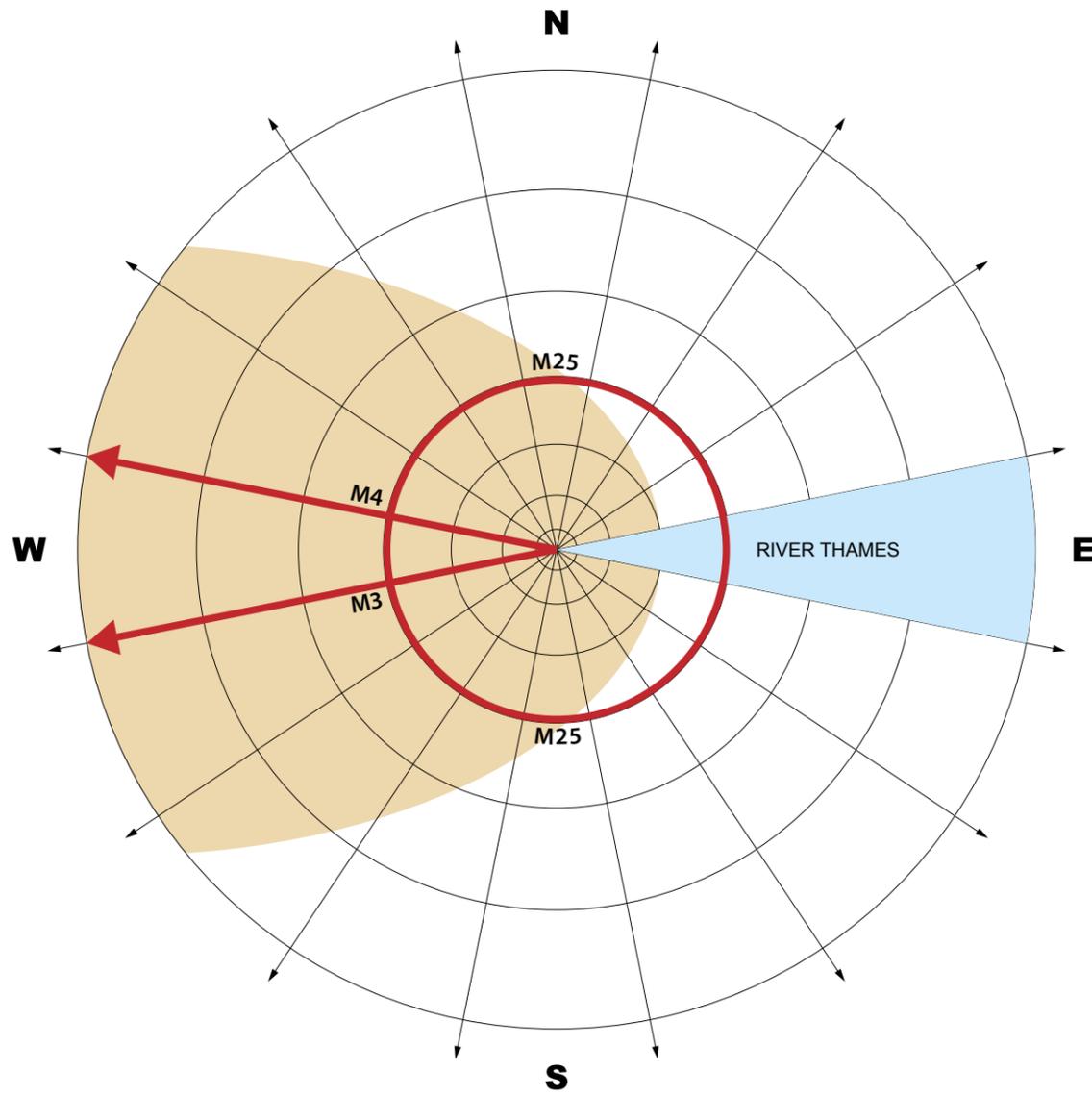
STOKE HARBOUR MASTERPLAN – HOO PENINSULA

SHELTER WOLFSON ECONOMICS PRIZE 2014 HOUSING SCHEME

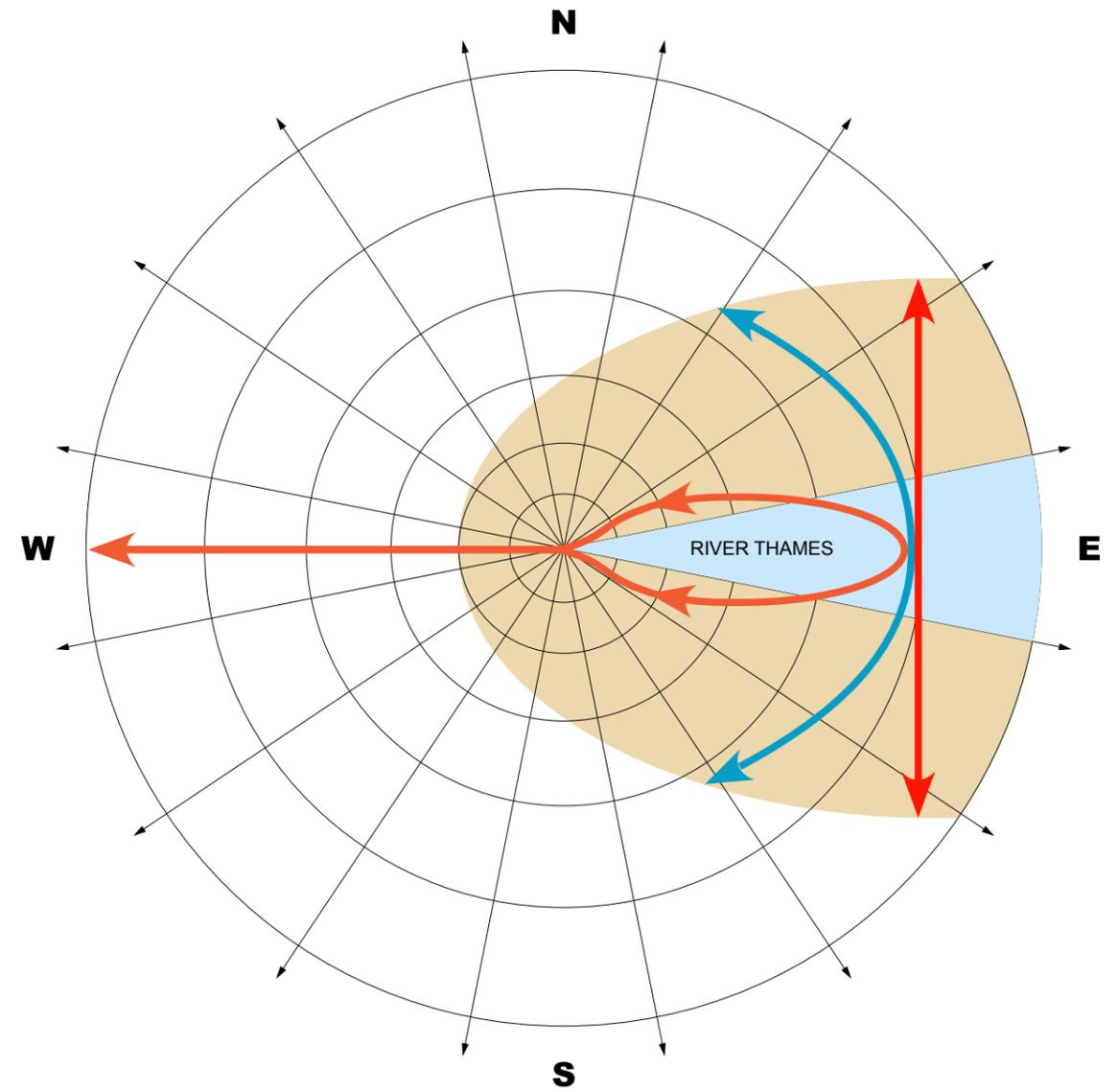


AGGLOMERATION BENEFITS

TRANSPORT NETWORKS AND GROWTH AREAS FOR LONDON



HISTORIC SYSTEM
GROWTH IN THE WEST



PROPOSED ADDITION
GROWTH IN THE EAST

INTEGRATED TRANSPORT

METROTIDAL CANVEY-HOO ROUTE OPTION

RAIL CONNECTIONS

- CROSSRAIL PLUS
- PITSEA - STROOD SHUTTLE
- C2C
- SHEPPEY TUNNEL

ROAD CONNECTIONS

- A13/A130 - A228/A289





Lord Andrew Adonis
Chair - National Infrastructure Commission
1 Horse Guards Road
London
SW1A 2HQ

Our Ref:
Your Ref:
Telephone: [contact redacted]
E-mail:
Date: 08 January 2016

Dear Lord Adonis,

Midlands Connect response to “Critical Infrastructure Challenges Submission to Infrastructure Commission”

Thank you for the opportunity to respond to the above document.

As part of last summer’s budget, Government confirmed its commitment to backing the Midlands to ensure it is Britain’s Engine for Growth and allocated **£5 million of additional funding for Midlands Connect** to help develop its vision and strategy for transforming transport connectivity across the Midlands (background information on Midlands Connect is enclosed for your information).

The strategy, currently being developed by the Midlands Connect Partnership together with the Department for Transport, will set out credible long-term strategic transport investment priorities to help unlock growth and jobs.

The Midlands Connect partnership believes the establishment of the national infrastructure commission presents an excellent opportunity to achieve a more consensual and long-term strategy for strategic transport infrastructure in the UK.

However the Commission’s current focus on northern connectivity, London’s transport infrastructure and energy is of concern to the Midlands Partnership as it gives no consideration to the Midlands and its strategic infrastructure transport requirements.

As you know the Midlands Connect Partnership met in December 2015 in Derby when it established a new strengthened governance arrangements with Government including the appointment of Sir John Peace as the Independent Chairman of the Strategic Board. The newly formed Midlands Connect Strategic Board will be meeting for the first time on February 4th.

I take this opportunity to invite you to join us on the day so we can learn first hand about the work of the Commission and explore opportunities for greater engagement with the Midlands as the work of the Commission develops further.

Yours Sincerely,

A handwritten signature in black ink, appearing to read 'Maria Machancoses', written over a horizontal line.

Maria Machancoses
Midlands Connect Programme Director
Midlands Connect Project Team



Midlands Connect Response to Critical Challenges - Northern Connectivity

Question 1: To what extent are weaknesses in transport connectivity holding back northern city regions (specifically in terms of jobs, enterprise creation and growth, and housing)?

Through our work on Midlands Connect our analysis shows that there will be large economic benefits from improving road and rail connectivity in the intensive growth corridors, by reducing the costs of travel, increasing output by facilitating business clustering, and unlocking job creation in our growth areas. This will require concerted action to tackle the connectivity challenges that we have identified.

There are significant connectivity challenges that will constrain the ability of the Midlands to realise its ambitions for growth. Whilst the Midlands lies at the heart of the UK's road and rail networks, the mix of long-distance, regional and local travel needs is placing heavy demands upon them.

The Midlands motorway network is subject to heavy congestion, with traffic delays and poor journey reliability, meaning that businesses, commuters and leisure travellers have to schedule additional time into the journey to give confidence that they can arrive at destinations on time.

This wasted time significantly increases the direct costs of travel, impacts on business productivity and is constraining the potential for business growth. Increased demand for travel in the Midlands will place the system under further strain, increasing costs of travel and constraining job creation. The analysis completed to date as part of Midlands Connect highlights that we will need to tackle congestion hotspots as well as looking at the reliability, resilience and quality of journeys provided by the strategic road networks.

There are fast, frequent rail links connecting large parts of the Midlands to the north and south, via the West Coast, Midland and East Coast Main Lines. However, there are major challenges travelling by rail between the Midlands cities, with long journey times and low service frequencies impacting on connectivity. This is a particular issue for the more rural areas such as The Marches, Worcestershire and Lincolnshire as this makes travel by rail inconvenient, leading to an increased reliance on car travel and reducing the scope for interaction between our cities. In particular, the slow speeds between the key regional cities of Nottingham and Birmingham highlights the need for improvements to be made to the classic rail networks in advance of HS2 Phase 2 which is scheduled for completion after 2030.

As connectivity between cities becomes more important in future, this will significantly constrain the capacity for growth in the cities across the Midlands. There is also an increasing problem of capacity and crowding on services entering and crossing Birmingham. This will cause problems both in accommodating growth in Birmingham and in improving rail connections across the whole Midlands.

Whilst the commission is focused upon connectivity, the importance of integrating growth plans and transport plans should be also recognised. Improving connectivity for the Midlands will create investment opportunities, but site development viability remains a long term constraint to the central urban areas absorbing the projected growth and realising the estimated anticipated economic benefit. Integrating strategic land use and strategic transport planning is crucially important.



Question 2: What cost-effective infrastructure investments in city-to-city connectivity could address these weaknesses? We are interested in all modes of transport.

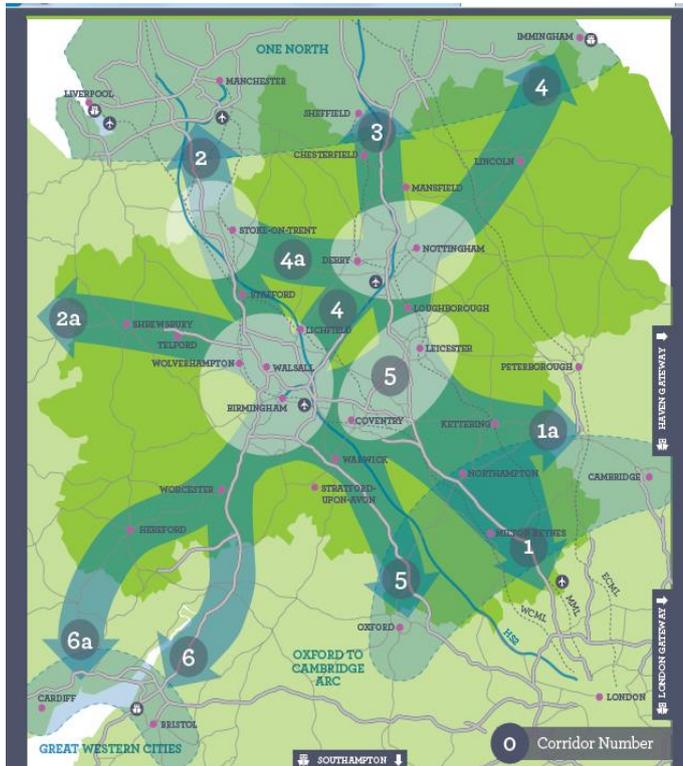
At this stage of Midlands Connect we have not defined solutions. With the support from DfT we are now developing the Midlands Strategic Transport Strategy that will set out our priorities with a clear evidence base.

Highways England and Network Rail are in the process of undertaking Route Studies across the Midlands to inform investment strategies post 2020. There are also medium to long-term opportunities to deliver HS2 Growth Strategies to fully capitalise on the opportunities for the whole Midlands. Midlands Connect will provide the mechanism to inform and draw together these elements into a single strategy that delivers much more than the sum of the parts

High Speed 2 will transform north-south travel, bringing Birmingham within 40 minutes and the East Midlands within one hour from London. It will also significantly improve connections between Nottingham and Birmingham. However, it will be critical to develop full connectivity packages to fully capitalise on the opportunities provided by new stations serving the West Midlands, East Midlands and North Staffordshire. It will also be important to reconfigure classic rail services to better meet the connectivity needs of the whole Midlands, including Northampton, Coventry and Leicester. However, prior to the arrival of HS2 and in particular the Phase 2 links, it is vital that the classic rail network continues to be enhanced and services improved to enable the continued growth of the Midlands economy.

Question 3: Which city-to-city corridor(s) should be the priority for early phases of investment?

Midlands Connect Partnership has identified six “intensive growth corridors” and four major hubs of economic activity across the wider Midlands - an area with a population of 11 million. These are shown in the map below.



The table below provides a summary of the impacts of improvements to connectivity (generalised journey times) to the Midlands by both road and rail, for both 2026 and 2036 have been assessed.

	2026 with 10%GJT reduction	2026 with 20% GJT reduction	2036 with 10% GJT reduction	2036 with 20% GJT reduction
Business JT Savings	£172 million	£341 million	£230 million	£460 million
B2B Agglomeration benefits	£514 million	£1,102 million	£550 million	£1,180 million
Labour Market impacts	£12 million	£29 million	£15 million	£33 million
Net additional jobs	138,000	296,000	143,000	306,000

Overall, there could be significant potential from improving strategic road and rail linkages – both north-south and east-west.

Question 4: What are the key international connectivity needs likely to be in the next 20-30 years in the north of England (with a focus on ports and airports)? What is the most effective way to meet these needs, and what constraints on delivery are anticipated?

The Midlands accounts for 16% of all UK exports selling to over 178 countries worldwide.



The Midlands Engine region is well linked internationally. Inward investment projects grew by 130% between 2011 and 2015 based on a compelling Midlands offer of commercial opportunity, affordability, connectivity and quality of life. In the same period, the Midlands Engine region attracted 880 Foreign Direct Investment projects creating over 48,000 new jobs and safeguarding a further 23,000.

It goes without saying that connectivity to ports and airports will be vital for continued growth.

The international gateways at Birmingham Airport and East Midlands Airport are critical to the whole Midlands economy. Currently Birmingham Airport acts as a business gateway to major global markets, including China, and East Midlands Airport is the UK's most important air freight hub outside London. Both Birmingham and East Midlands Airports have ambitious growth plans for the future which will support the growth of the wider Midlands economy. Effective surface access links to these hubs are therefore critical to ensure that they can operate effectively in the future. Both airports are challenged in this respect, with East Midlands Airport only accessible via road and Birmingham Airport located adjacent to congested strategic road links and also not having direct rail links to the East Midlands.

The Midlands is also served directly by several ports including Grimsby and Immingham and Boston. Addressing the reliability and speed of connectivity will be essential to improve the efficiency and productivity of our businesses. With 16% of all UK exports there are significant gains to be made.

With the strong export market of the Midlands wider connectivity to national ports is vital. Our work to date has identified that there is a need to address reliability of the links to ports including Enhance road freight links (with a focus on speeds and reliability) between the Midlands logistics and manufacturing hubs and ports, including Humber, Haven Gateway, Southampton, Bristol and Liverpool. Key sections of the network that need addressing include the M6, M5, A14, Birmingham Box and onwards connections to ports such as Southampton.

Question 5: What form of governance would most effectively deliver transformative infrastructure in the north, how should this be funded and by whom, including appropriate local contributions?

The current proposal regarding Sub-National Transport Bodies and Combined Authorities at regional levels are appropriate and effective forms of governance in the Midlands to deliver transformative infrastructure.

Mole Solutions Submission of Evidence to the National Infrastructure Commission.

Executive Summary

This submission of evidence to the NIC is that the Mole Solutions Limited freight pipeline concept can bring innovation and benefits to future UK and global transport systems in general and that of London in particular.

DEFRA, Innovate UK, Future Railway and the Nuclear Decommissioning Agency have already invested in Mole Solutions' R and D projects that have proved both the concept and demonstrated the technology. A Feasibility Study of the Mole Urban Concept was completed for Northampton in 2015 and showed that it is technically, economically, socially and environmentally viable at comparatively low volumes. Examples are given as to how the concept could be used in a number of current scenarios within future London transport schemes.

The next step is to embrace the concept as a significant input to future transport planning and integrate it as a complimentary feature with existing transportation infrastructure.

Introduction.

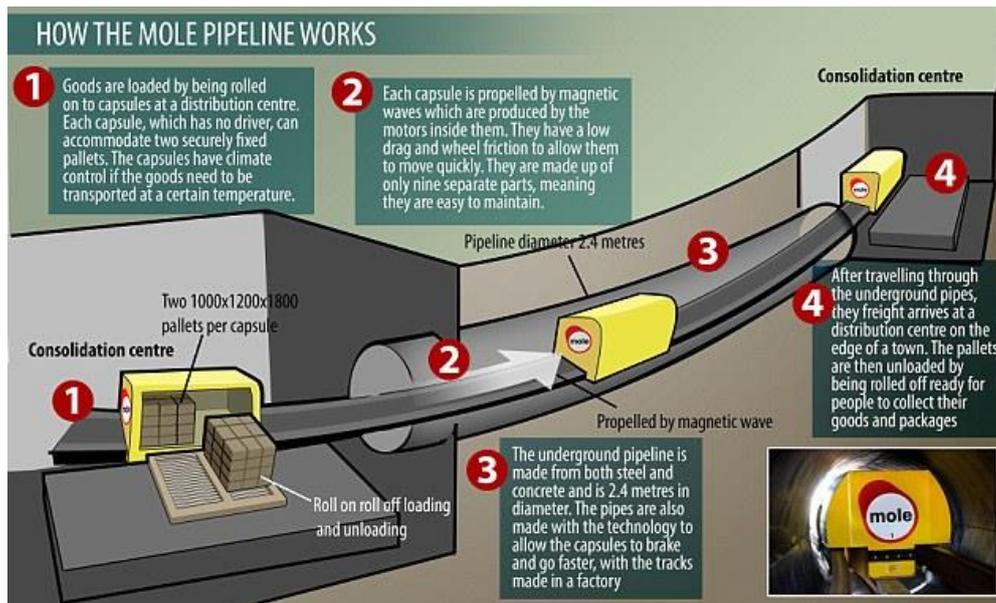
Mole Solutions Limited (MSL) evidence to the NIC is based on the potential impact that freight pipeline technology can have on the freight strategy needs of the UK and London specifically.

Underground passenger transport has been commonplace in London, and many other global cities, since the 19th century but underground freight transport of solid goods within cities does not exist anywhere in the world. Freight pipelines are currently limited to the transport of liquids and gases and also play an important role in the delivery of clean water to, and dirty water from, most properties in the civilised world.

MSL was established in 2002 with the business objective of developing and commercialising the concept of freight pipelines designed to carry unitised and non-unitised goods: tote bins, pallets, roll cages, shipping containers; bulk products: minerals, building spoil, aggregates, biomass, etc. See www.molesolutions.co.uk

MSL's research has shown that the major applications of freight pipelines in London can be:

1. In major regeneration projects where a freight pipeline could be used for the removal of spoil and the delivery of a large percentage of building products to the regeneration site
2. On completion of the building project the freight pipeline can be readily converted to provide a goods delivery system to the site's new function
3. In the use of consolidation centres where freight is delivered to an out of area consolidation point avoiding HGV's in the congested city centre. Freight is then transported in a freight pipeline to its point of use or to a substation for last mile delivery by appropriate eco-friendly transport. See illustration



Principles of the Mole Freight Pipeline concept are:

- SIMPLE and MATURE technology to provide high reliability, availability and maintainability
- ELECTRICALLY POWERED to be sustainable and have low environmental impact
- ENCLOSED to be safe and secure
- HIGHLY AUTOMATED to allow 24x7 unmanned operation
- MODULAR CONSTRUCTION to minimise time and cost of installation
- LAID BESIDE/UNDER EXISTING TRANSPORT INFRASTRUCTURE to simplify installation and integrate with existing supply chains

Benefits of the Mole system are:

- VERY LOW DIRECT OPERATING COSTS: automated, energy efficient, simple maintenance and repair offers direct operating costs of approximately 15% of road costs
- COST EFFECTIVE INCREASE IN INFRASTRUCTURE CAPACITY: modular construction using the total 3D footprint of existing and disused transport infrastructure shortens the construction time and provides attractive investment returns at low capacity utilisation
- INDIRECT COSTS: resilient transport infrastructure enables reliable Just-In-Time services allowing the full JIT benefits to be realised
- SOCIAL: freight only, separate system offers intrinsically the lowest accident rates of any mode; transferring freight from the roads releases capacity and contributes to a reduction in congestion
- ENVIRONMENTAL: lowest environmental impact of all the transport modes - power is as green as the electricity supply; low carbon, air pollutants and noise, significant reduction in road damage.

Freight Pipeline projects since 2010

The Freight Pipeline concept has been recognised as an emerging and viable transportation system by DEFRA/DfT, the Technology Strategy Board, Innovate UK and Future Railway all of whom have grant funded research and development projects by MSL over the last five years. Additional support in these projects has come from a number of partners including DHL, Laing O'Rourke, Morgan-Sindall, PA Consulting Group, Arup, Force Engineering, WGH Engineering, Lafarge-Tarmac and Urban and Civic. MSL have shown in the following projects that the concept is applicable to a wide range of freight transport:

1. 2015 completed on time and budget four projects:
 - a. An Innovate UK 'Proof of Concept' project to establish the viability of the Mole Urban Freight System in Northampton. The conclusion is that the concept is viable and it is planned to begin in 2016 the development of a comprehensive Business Plan for Northampton. The project has also developed the methodology that can be used to evaluate the concept in any conurbation anywhere in the world.
 - b. A Pre-Feasibility Project of the Mole Urban Freight System for Transport for Greater Manchester. The proposed system could be used: to extract spoil from the major regeneration of the Manchester Piccadilly Station area; the delivery of most of the building products to the site; a legacy goods delivery system from Port Salford into Manchester. An outline Feasibility Study proposal was produced and is being considered by TfGM as part of their total transport strategic plan.
 - c. In conjunction with ARUP, an evaluation for Radioactive Waste Management of the use of the Mole system in the development of Deep Storage Facilities. The conclusion reached was that the concept offered significant benefits for much of the freight transportation required in the development and operation of the proposed facility. Outline designs for the components of the system were produced which would provide the basis for a detailed Feasibility Study when required.
 - d. MSL were successful in a Future Railway competition to study the use of Linear Induction Motors (LIMS) to provide independent braking to trains when the conventional wheel on rail braking fails due to circumstances such as leaves on the track. The study showed, using computer simulation and physical trials on a modification to our development track, that the Mole concept met the competition brief. The next stage is to submit a proposal for second stage funding to scale up the components and evaluate a full size pilot system. If MSL are successful with their proposal, work will begin in the middle of 2016.
2. In addition, in July 2015 MSL were selected by the University of Texas (UoT) to be a member of the Stakeholder Group for the Feasibility Project into the potential use of freight pipelines in Texas. This 3M\$ study is financed by the State of Texas and is focussed on evaluating the use of LIM powered freight pipelines to transport thousands of shipping containers over distances in excess of 250 miles. We have reached an agreement with UoT that MSL will provide technical input on the design of the hardware and software in the development of the concept.
3. 2013/14 designed, commissioned and demonstrated to more than 70 organisations a bulk system capable of carrying 10m tonnes per annum in a pipeline of 1.3m internal diameter. The project was part funded by a TSB 'Development of Prototype' grant.

4. 2012 completed a 'Proof of Concept' project, partly funded by the TSB 'Smart Grant Scheme', the objective of which was to: produce outline designs for the components of a bulk freight pipeline system; compare the financial viability of a Mole system with long haul conveyors; produce an animated video explaining the concept. The project outputs are: the outline designs; a financial analysis that showed for volumes greater than 750ktpa and distances greater than 750m, a Mole system offered a better investment than conveyors and would be much safer and cleaner; the video can be viewed at our website: www.molesolutions.co.uk
5. 2010 Completed a DEFRA funded/DfT managed Feasibility Study: '*Assess the feasibility of using freight pipelines to transport aggregates in England*'. The conclusions reached are that: the individual technologies are well proven - the innovation is in the manner in which they are combined; at relatively low levels of capacity utilisation (~ 10%) the return on investment was calculated as 10% and this increased with utilisation; major social and environmental benefits would be generated; simple routes could be developed in less than three years

Technology Readiness Level (TRL).

The recent projects have shown the individual components of the Mole Concept are all well proven technologies; the innovation that Mole Solutions has developed is combining these individual technologies into a world leading Freight Pipeline system with extensive global applications.

Global potential.

MSL have attended and presented papers at the last three International Society Underground Freight Transport Conferences: University of the Ruhr, Shanghai and University of Texas. Attendance at these events came from the UK, USA, China, Japan, Germany, The Netherlands, Italy, Canada, Belgium and Turkey.

In April 2015, MSL were interviewed by the FT and the subsequent article produced a tsunami of publicity both in the UK and from around the world. The level of interest in this innovative approach to the global issue of road congestion is considerable. Further press releases are planned for the first quarter of 2016.

Specific evidence for London's transport infrastructure.

Mole Solutions evidence is focussed on the potential of underground freight pipelines within London and its commuter hinterland.

Q1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

The major challenges facing London and its commuter hinterland are summarised in the Roads Task Force report published in July 2013.

The key issues are:

- Population growth. The population of London is expected to increase by 2.06 million by 2036
- Limited space: the challenges of meeting the conflicting demands of the capital call for innovative transport solutions that make a significant contribution to maintain and increase the quality of life in the capital.
- Road congestion: costs in excess of £4bn per annum and has been increasing by approximately 1% per annum whilst traffic levels have fallen by a similar rate. Freight accounts for 30% of London's peak traffic and any scheme which can reduce this will lessen the predicted increase in congestion in Central London.
- Safety: the removal of a significant number of freight vehicles from the streets of London will help to remove the perceived danger of these vehicles by inexperienced cyclists thereby aiding the ambition to increase the planned growth in cycling within London
- Pollution: Unless London's air quality improves, the EU is expected to fine the Capital £300 million. MOLE has the potential to be part of a solution which will improve London's air quality, particularly the reduction of NOX and CO₂.
- Cost: the DfT's value for infrastructure damage from HGV's in conurbations are 28p/truck mile for 'A' roads and 171p/truck mile for other roads. Trucks are therefore a major contributor to road maintenance and a reduction of road freight miles should be reflected in lower road maintenance costs.

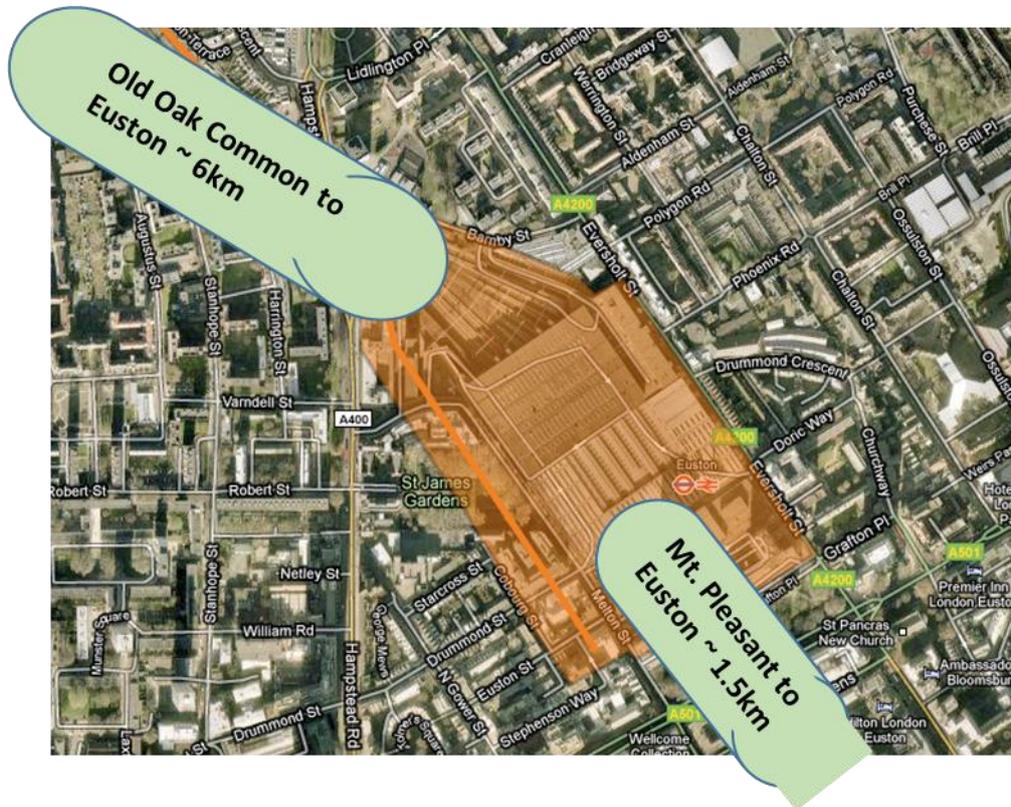
Q2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

Our submission is based on the development of underground freight pipelines to take a significant volume of road freight off of London's streets and transfer the goods to capsules travelling on rails in pipelines of approximately 2.4m internal diameter.

"I've seen the Mole Solutions demonstrator and therefore seen how much of freight can be transported in the 21st century; anyone involved in designing transport infrastructure should understand what role the Mole concept can, and can not, perform within their plans". Darryl Stephenson, Head of Value Engineering, HS2, July 2014.

Examples of how a freight pipeline system could fit with the planned and existing transport infrastructure projects for London are given below. The examples are suggestions only, there are many other applications where the freight pipeline concept would be part of, if not all of, the solution.

Example A – HS2 and Euston Station.



Possible pipeline routes to/from Euston

It is planned to make the new Euston Station a major retail complex and for the goods for the total station to be delivered by road via an access from the Hampstead Road to an undercroft of four acres, the construction cost of which is estimated as £100m. Delivering the goods and removing the dry waste by means of a Mole system would reduce the need for such a large undercroft and reduce congestion on one of the busiest routes into the centre of London.

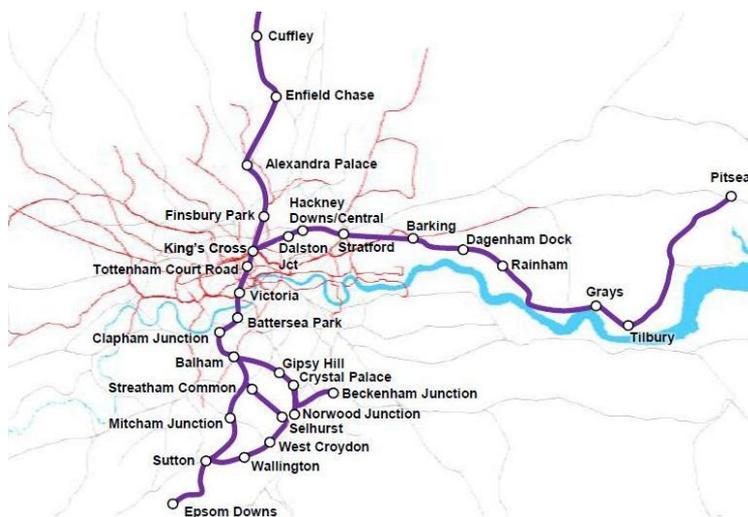
Two routes are possible:

1. Towards the Old Oak Common / Park Royal area where goods destined for Euston would be delivered to a consolidation centre. Here the goods would be transferred to a pipeline constructed largely under the canal network.
2. Developing a short tunnel from Euston to the Mail Rail system near Mount Pleasant; a modernised and extended Mail Rail system could then be used to connect to the Park Royal area, again using a pipeline under the canal network.

Example B – Crossrail 2 – Option 12.

The Mole Solutions approach would involve:

1. Designing CrossRail 2 to incorporate 2.4m internal diameter freight pipelines beside the 7.0m internal diameter tunnels of Cross Rail 2
2. These pipelines could be used as a safer, more reliable spoil removal system in the construction of the tunnels
3. Extending CR2 to Pitsea and including Mole freight pipelines in the construction would provide a pipeline link to London Gateway Container Port and Logistics Park and offer a freight route into London avoiding one of the most congested sections of the M25, The Dartford Crossing. Again, the system can be designed to deliver goods into London and for the removal of much of the dry waste products.



In addition to the benefits mentioned in Q1 the use of a Mole system that provides a reliable, regular delivery service throughout the working day enables stock to be held remotely in areas where rents are typically 10% of central London, Approximately 25% of the area of a typical retail store is non-selling space including back room storage space. The ability to convert this storage space into retail would be of significant benefit to retailers.

Sectors served by the freight pipeline system are largely those served by road: retail, commercial, public sector, etc.

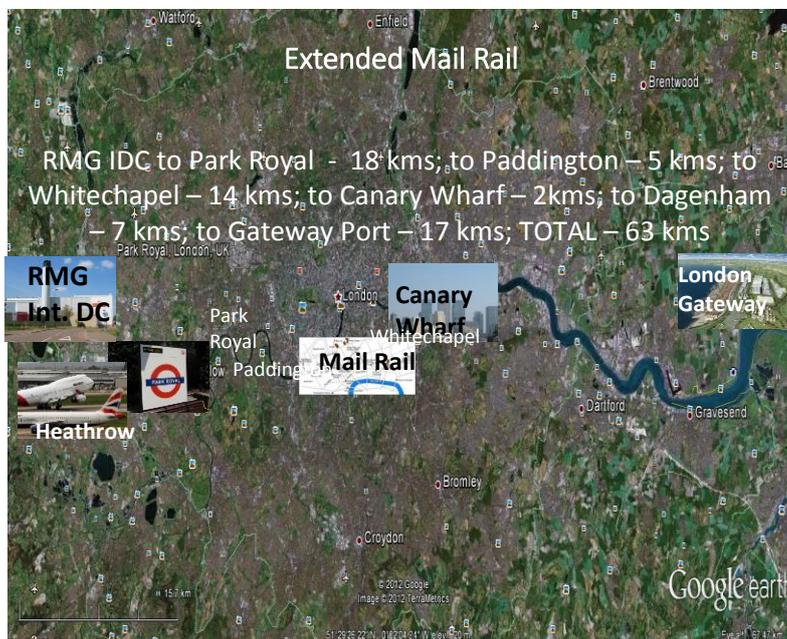
As in Example A, goods destined for the centre of London would be delivered to strategically located consolidation centres (e.g. the logistics park co-located at London Gateway Container Port) from where the loaded capsules would travel to a number of locations within London. These locations would be located in, or very close to, centres of high demand which would also be the operational base for low impact 'Last mile' delivery vehicles.

Example C – Modernised and Extended Mail Rail.

London is fortunate to have had the only extensive goods freight pipeline in the world, Royal Mail's Mail Freight system that operated under the streets of London from Whitechapel, via the City, Mount Pleasant and under Oxford Street to Paddington. The system operated reliably and cost effectively from 1927 to 2003 when the system was mothballed. Although a section around Mount Pleasant is being converted into a postal museum, the remainder of the nine mile long system is considered to be in a good condition and could be made operational at a comparatively low cost and in a matter of months.

The Mole Solutions approach would involve:

1. Modernising the existing mothballed system
2. Tunnelling round the Mount Pleasant area to re-establish the Paddington to Whitechapel route
3. Tunnelling from Mount Pleasant approximately one kilometre north to provide a link to Euston and St. Pancras Kings Cross
4. Extending the system to the west to beyond the M25 to serve Heathrow and beyond. The route for this could either be from Paddington, the existing western end of Mail Rail, using the route of the Grand Union Canal system to Slough or via a Euston – Park Royal pipeline and then the Grand Union Canal. In the east, the system could be extended from the current terminus at Whitechapel out to London Gateway using either the route of CR2 Option 12, or a new route laid predominantly under the Thames.

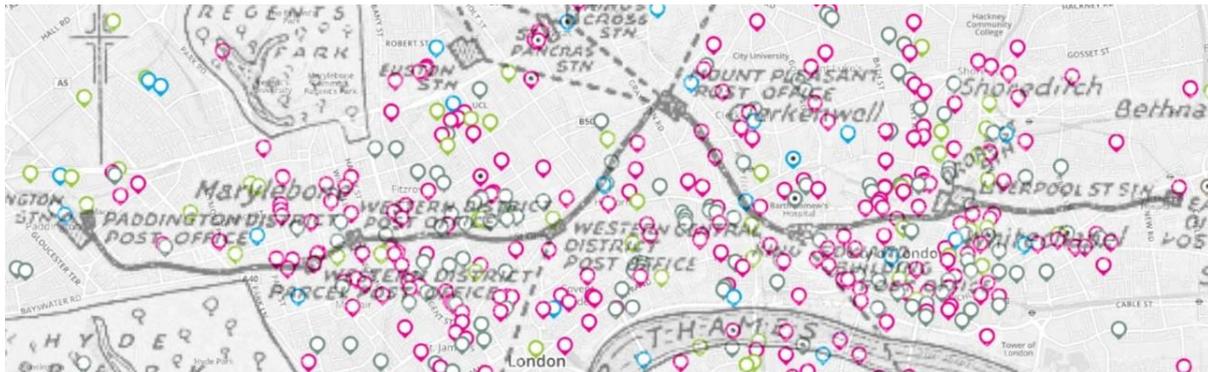


When fully operational, Mail rail had nine stations with street level access, at most of these the street access has been closed although the underground station still exists. New access methods would need to be designed and constructed.

A principle of the Mole concept mentioned in the introduction is that of modular construction. This entails constructing the key components of the system (track, propulsion and control) in 12m length modules off site in the form of a sleeve that is delivered to the construction site where it is slid into the tunnel sequentially.

It is assumed that the existing Mail Rail tunnels are still covered by a Transport Works Act (TWA) but clearly any extensions and new street level access points will need a TWA and Planning Approvals

Example D – London Building Projects.



Route of Mail Rail and Major Building Projects

The major building sites in the centre of London contribute significantly to the congestion problems of the capital. The Mole Solutions approach would involve:

1. Designing and constructing short tunnels to connect each major site in the form of a ring main
2. This ring main would be linked to the eastern section of the Mail Rail system which would then be used to remove spoil and deliver building products to the sites
3. On completion, the capsules and intermodal facilities would be converted to carry much of the goods destined for the City.

Ideally a comprehensive evaluation of the potential for freight pipelines within London needs to be undertaken to ensure that full account of planned and existing disused tunnels are included. In terms of prioritisation clearly the first priority should be to understand the potential of Mail Rail. The potential for using a Mole system to alleviate much of the traffic congestion caused by goods vehicles during the construction and operation of a regenerated Euston Station should also be examined as a matter of urgency given the recent publication of the High Speed 2 Bill.

Q3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Utilising the route to incorporate freight pipelines and multi utility trunking will provide new income from tolls paid for use of the pipeline, an increase in retail space from converting 'back store' storage space into retail, a reduction in the number of accidents, an improvement in the air quality and a reduction in road damage.

Q4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

- *What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?*
- *What innovative funding mechanisms could be considered to support delivery of key schemes?*

This question is to be addressed in the next stage of the Northampton Project, the comprehensive Business Plan. At this stage we are proposing to examine the concept of ‘who benefits pays’.

Q5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

London’s Mail Rail exemplified the benefits of freight pipelines from 1927 until the network was mothballed in 2003. It acted as inspiration for academic research in the concept in Germany, The Netherlands, New York, Beijing and Shanghai. It was designed in 1909 when congestion was a major issue but largely from horse drawn transport. The major west – east commercial axis that the system was designed to serve is still very important but it is essential to recognise the change and growth of London’s commerce. Therefore any development of the underground freight pipeline concept should begin with an understanding of what, and where, freight pipelines could be beneficially installed and the stages necessary to develop a fully functioning network.

Summary and Conclusions

This paper submits evidence to the NIC that the MSL freight pipeline concept can bring innovation and benefits to future UK and global transport systems in general and that of London in particular. UK government agencies have already invested in R and D projects that have proved both the concept and demonstrated the technology. A study of Northampton has shown that the business case for its use can be sound. Examples are given as to how the concept could be used in a number of current scenarios within future London transport schemes.

The next step is to embrace the concept as a significant input to future transport planning and integrate it as a complimentary feature with existing transportation infrastructure.

**Response to the National Infrastructure Commission Call for Evidence, 13th
November 2015**

***The Economic Case for using Fibre Reinforced Polymer (FRP) Composite
Materials in infrastructure Connecting Northern Cities, London's Transport
Infrastructure and Electricity Interconnection and Storage***

Pre-amble

This submission describes the role which Fibre Reinforced Composite (composite) materials could play in a variety of infra-structure applications related to Connecting Northern Cities, London's transport infrastructure and some aspects of Electricity interconnection, particularly low-cost pylons. We have therefore taken the liberty of sending this to the three email addresses.

The National Composites Centre

FRP composite materials are strong, light and highly fatigue and corrosion resistant. The UK is a world leader in the application of composite materials which are used in a wide and increasing range of applications. Their usage is forecast to grow in the UK up to six-fold by 2030¹, largely on the back of the need for a step-change in the fuel efficiency and emissions of all forms of transport equipment.

The NCC is part of the Innovate UK-sponsored High Value Manufacturing Network which aims to help UK companies bring better products to market more quickly. It operates in the gap between universities and the point where companies are confident enough to invest heavily in new technologies; this is often referred to as the 'valley of death'.

The Centre is one of the most capable of its type in the world. It has the latest full-size industrial equipment and approaching 200 staff with expertise in material selection, design, simulation, sub-scale and fully scale prototyping and testing. It is currently working with many of the UK's leading companies and universities to develop the next generation of aircraft wings, jet engines, lightweight cars, oil and gas structures and a host of other applications.

The NCC is a not for profit organisation and has been specifically established to develop cost effective products and, where necessary, work with regulators to develop new standards to provide end-users with the confidence that products are fit for purpose.

Introduction

There are extraordinary challenges in maintaining and upgrading the UK's existing infrastructure whilst boosting the capacity to meet the challenges of a growing and increasingly mobile population. In addition to efforts to boost house building, and general construction, there are plans for huge public and private investment in National Infrastructure from 2014-15 including energy, (£275bn), transport (£142bn) and water (£23bn) projects².

¹ 2015 unpublished UK Trade and Investment Report: Present and Future value of the UK composite market

² National Infrastructure Plan 2014, HMT, Dec 2014

In the 19th and 20th centuries, the UK was a pioneer and innovator in the development of rail, road, water, sanitation and power distribution infrastructure. Some of that original infrastructure is still in use today and although much of it is now in need of replacement, it is a testament of the quality of design and materials used.

Other infrastructure, much of it installed in more recent times, has fared less-well and requires significant inspection, maintenance and repair at significant cost.

Unlike some other parts of the world, composites are not widely used in UK for bridges, gantries and tunnel linings for which they are well suited. This has implications for taxpayers and the supply-chain which is under-developed relative to other industrial economies.

Composites materials could make a significant contribution to upgrading infrastructure which would cost less to buy, install and maintain throughout its life.

Transport Applications in the North of England and in the London area

The scale of the challenges faced by Network Rail, Cross Rail, Highways England, London Underground, and in due course, HS2 are immense. Network Rail has to maintain around 40,000 bridges and 900 tunnels, many dating back to Victorian times as well as thousands of pieces of trackside infrastructure such as platforms, roofs, signals and cabinets. Similarly, Highways England has over 8000 bridges and 4000 gantries amongst other assets valued at £110 billion³ and Local Authorities own an estimated 80,000 bridges between them⁴.

The international academic case studies in Appendix 1 show that composite bridges can achieve a total life-cycle cost savings (*excluding* installation and decommissioning) of around 40% compared to those using traditional materials. The National Composites Centre believes these are conservative⁵ figures in light of new composite manufacturing processes which have significantly reduced the initial cost of FRP structures.

The saving quoted do not include the costs of installing and commissioning the bridges which can be significantly lower than conventional bridges.

Composites are increasingly used internationally for tunnel linings (often using British materials) because of their resistance to water ingress and the speed of deployment.

Interestingly, a Technology Strategy Board funded competition led by London Underground and involving, amongst others, Atkins and the National Composites Centre, won the prestigious Stephenson prize in 2014 for developing a composite underground train door. It was estimated this would, if fitted to Central Line trains, save £5m pa in terms of lower energy costs, reduced track damage and the reduced time needed for passengers to get on and off the train⁶.

³ Meeting with Highways Agency

⁴ Highways Agency estimate

⁵ One rail industry consultant estimated that of the total 125 year life-cycle cost of steel infrastructure, only 10% was accounted for by the initial purchase price; the remaining 90% being for installation, inspection and repair.

⁶ www.nccuk.com

As an example of an extreme application in another sector, a National Composite Centre study established it is possible to produce very large offshore structure with a mass of just 10% of the existing design which would reduce deployment costs and eliminate the need for painting⁷.

Why use composite materials?

National infrastructure is expensive to build, install, inspect, maintain and repair. Much of it is built from steel and concrete, both of which are highly susceptible to corrosion. The Institute of Materials estimates the cost of this corrosion as being circa 3% of GNP or around £600 per person which is *'the equivalent to the entire infrastructure of the country disintegrating due to corrosion processes in about 30 years'*⁸

As well as having resistance to corrosion, composite structures are much lighter than traditional materials and can be installed quickly and with smaller (and cheaper) lifting gear. The footbridge at Dawlish railway station (which withstood the 2013 storm damage), is one of the few FRP bridges on the UK rail network due to its location in a salt-water environment.

It was installed during the course of one night with minimal disruption to the network. Similarly, a trunk road bridge in [Frampton Cotterell](#) in South Gloucestershire (which was assembled at the National Composites Centre and is shortlisted for a Prime Minister's award⁹) was installed over a weekend in the summer of 2014. Such bridges are the exception but do show that some infrastructure owners are willing to use them.

It is possible to fit sensors into composite structures to provide a remote structural health-monitoring capability. Whilst this would need to be undertaken as part of a wider systems-approach, it could help reduce the need for regular inspections in favour of a needs-based maintenance regime.

Barriers to the use of Composites Structures

The UK lacks a building code for composite bridges. This means that each one is custom designed and made as a one-off. Without a suitable code, there is no prospect of achieving the economies of scale needed for composites to be used routinely.

Some UK infrastructure owners have said that the importance of total life-cycle cost is not properly reflected in public procurement. One railways consultant¹⁰ estimated that the initial purchase price for a bridge was probably around 10% of the total life time cost over 125 years. Whilst this is purely anecdotal, it does indicate the importance of this issue.

These factors, and a degree of conservatism, are barriers to innovation and largely preclude the use of materials which could reduce the costs of maintaining the national infrastructure.

In contrast, the Netherlands has developed a very successful composite bridge industry. This was established to address the need for lightweight lifting bridges over the many canals and was facilitated

⁷ NCC report for a client

⁸ The Institute of Materials, Minerals and Mining <http://www.iom3.org/corrosion-committee/corrosion-committee-board>

⁹

[http://www.gazetteseries.co.uk/news/13803443.Innovative Frampton Cotterell bridge is shortlisted for national award/](http://www.gazetteseries.co.uk/news/13803443.Innovative_Frampton_Cotterell_bridge_is_shortlisted_for_national_award/)

¹⁰ From a UK rail consultancy as part of an NCC study into the application of composites in large structures, 2014

with the support of large orders from national and local governments (including the City of Rotterdam which ordered 200 bridges in 2011¹¹). A number of UK contractors have reported that Dutch suppliers can undercut them (by up to 70%) which illustrates a serious lack of capacity and capability in the UK supply-chain.

Conclusions and recommendations

After many years of under investment, the UK is investing heavily in a wide range of infrastructure which will be expected to perform well into the 22nd century. The Government has established the National Infrastructure Commission in recognition of the need to deliver affordable solutions to meet the UK's needs.

The conservatism of the specifiers, a lack of design codes and procurement rules which often penalise innovation, are impeding the adoption of composite infrastructure which could save their owners and ultimately UK tax payers significant sums of money.

The UK is a global leader in the design and manufacture of infrastructure and is missing an opportunity to meet the domestic challenges and address the export market.

Our recommendation to the Commission are therefore as follows:

- Work with infrastructure owners, suppliers and prospective supply chain companies, professional bodies and organisations such as the National Composites Centre to understand the potential impact of having composites as an alternative to existing materials for infrastructure;
- Work with regulators and codes/standards setting agencies to establish new & appropriate standards for the design, installation, maintenance and decommissioning of composites infrastructure.
- Review procurement process to chance give greater emphasis to through-life costs
- Investigate the steps needed to develop the capacity of the UK composites supply chain;
- Educate procurers, architects, designers and engineers in the value of the material;
- Fund collaborative research and development (CR&D), taking into account cross-sector knowledge, to examine materials, processes and high-volume manufacturing techniques.
- Develop training courses for the manufacture and commissioning of composite structures.

The NCC is keen to assist the Commission's any way possible.

Prepared by Graham Harrison, Strategic Partnerships Director, graham.harrison@nccuk.com

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¹¹ http://www.fibercore-europe.com/index.php?option=com_content&view=article&id=345:200-composite-bridges-for-rotterdam&catid=25&lang=en&Itemid=262

APPENDIX 1:

Example of the use of composites in bridge applications

‘Composite bridges have very low weight and high strength to weight ratios, high tensile strength and high fatigue resistance. They do not exhibit chloride corrosion problems, which have been a continued challenge for bridge engineers. This results in lower maintenance costs. It has also been observed that FRP (fibre reinforced polymer) composites maintain their superior qualities even under a wide range of temperatures. Other highly desirable qualities of composites are high resistance to elevated temperatures, abrasion, corrosion, and chemical attack. Some of the advantages in the use of composite structures include the ease of manufacturing, fabrication, handling and erection which can result in short project delivery time’¹²

It is therefore strange that there are very few composite bridges in the UK compared to other developed countries in North America, Europe and Asia.

The major owners of the UK’s transport-related infrastructure have all explored the use of composite materials (Highways Agency has just 3 FRP footbridges) or are receptive to doing so¹³. The barriers identified to the widespread use of composites include: a lack of codes/ standards for composite bridges; a perception that they are expensive; a lack of composite designers; and as the industry itself admits, an inherent conservatism.

Cost

There is a significant body of evidence in the USA, some dating back to 2003, which compares the life cycle costs, which includes initial purchase cost, maintenance and disposal costs, of bridges built with concrete and composite decks over their anticipated life-spans. These suggest the cost saving by using a composite bridge over a 75 year life span could amount to 10%- 30%¹⁴. This is almost certainly, conservative in light of developments in the cost of composite bridges relative to concrete (below). Further these figures are for mixed material bridges and all-composite bridges could have even more significant advantages.

A Japanese report¹⁵ compared the costs of various types of concrete bridge decks (with varying degrees of corrosion protection) with a composite alternative. This showed that the composites option could be around 15% cheaper to buy than the most protected and expensive concrete option but its total ‘life-cycle cost’ over 100 years would be 24% cheaper. It is worth noting too that the *life cycle cost* was 40% less than a standard concrete bridge.

¹² Evaluation of the Economic Feasibility of Fiber-Reinforced Polymer (FRP) Bridge Decks, Sahirman, Creese, Setyawati. Industrial and Management Systems Engineering Department, West Virginia University, 2003

¹³ Meeting with Network Rail, Highways England, Crossrail and London Underground, September 2014

¹⁴ As footnote 5 above

¹⁵ A Case Study of Life Cycle Cost based on a Real FRP Bridge, Iishizaki, Takeda, Ishuzuka and Shiomura, Nagaoka University of Technology, and Public Works Research Institute, Tsukuba, Ibaraki, Japan

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Since these reports were published, there is significant evidence from studies, including one commissioned by the Highways Agency, which finds that composite bridges – if bought in batches of around 20 – can be *cheaper* to buy than equivalent concrete bridges. Undertaking a life-cycle analysis on this basis would suggest even more significant savings over the life of the asset.

It should be noted that the savings above do not take into account the time required to install or remove the bridges and the real costs of taking roads or railways out of commission for protracted periods of time.

Jo Kaye
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Milton Keynes
Buckinghamshire
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8 January 2016

National Infrastructure Commission call for evidence; Large-scale transport infrastructure improvements in London

Network Rail welcomes the opportunity to contribute to the call for evidence by the National Infrastructure Commission concerning large-scale transport infrastructure improvements in London.

1: Major Economic and social challenges facing London and its commuter hinterland

London's economy is continuing to grow, encouraging further population growth and demand for rail services within and beyond the capital.

The London and South East Market Study, produced by Network Rail on behalf of the industry, included a comprehensive review of the key drivers for future Rail growth, based around four scenarios determined by the trade-offs between the economy and social/environmental planning. In every scenario growth in employment in central London continues, reflecting London's unique status as a global employment market. The density of employment in central London is high, driving agglomeration and enhancing productivity.

This high density of employment in central London and the lack of capacity of the road network has created a strong market for rail travel, which is expected to grow further in line with increases in central London employment. The current mode share of rail, Underground and DLR for peak travel into London is 80%, and in recent years the number of people entering Central London by car in the peak has fallen – from 143,000 in 1996 to 64,000 in 2012. This is attributed to measures to improve bus and cycle flow (and safety) that have in effect reduced road capacity for cars, as well as to some extent the effect of the congestion charge. The need to cater for a growing commuter market amplifies the existing challenge of providing sufficient capacity for peak travel, which may remain underutilised at other times (although a growing economy should deliver increasing levels of disposable income which would encourage further off-peak travel).

The presence of employment attracts people to live in London, and the London Plan forecasts continuing high rates of population growth. However, given existing low levels of housing affordability and limited availability of land the likelihood is that many employees will be forced to live either in outer areas of the city or in the towns beyond the green belt. In both cases rail is well placed to meet this resulting commuting demand, as distances

become too long to be undertaken feasibly by other modes and, assuming roads policy remains broadly consistent, it is unlikely that sufficient road capacity will be available for journeys to be made by car. Network Rail is particularly conscious that, in addition to strategies which support investment in rail within London, it is critical that investment supports settlements beyond the city itself, given the significant proportion of the London employment market comprised of employees who live outside the city.

It is also anticipated that the number of Londoners in older age groups will increase, strengthening the need for investment to improve the accessibility of the transport system. A number of other demographic changes are identified in the London Plan. These include an increasing proportion of ethnic minorities and children, and the need to address continuing levels of social deprivation. Rail needs to carefully consider these factors and act to address them where it can.

Whilst accommodating demand for peak travel (particularly into Central London and Docklands) clearly poses the greatest capacity and connectivity issue for transport infrastructure, it is also vital that connections to international gateways (particularly airports but also HS1 stations) are maintained and improved. Providing sufficient connectivity to HS2 will also be a key future requirement.

2: Strategic options for future investment in London's transport

Network Rail believes that it is critical to the London and South East economy, and the wider UK economy, to continue with a rolling programme of enhancements to the rail infrastructure in and around the London area. The demand from passengers continues to grow, and both the general infrastructure and many specific train services are operating beyond capacity. Network Rail with industry partners has developed proposals to provide capacity to meet this growth through the Route Study process. During peak times service reliability is suffering already as passenger congestion becomes widespread at key stations as well as on the trains themselves.

To address this and to continue to support economic growth by providing improved rail services, these operational and capacity challenges will require investment in both the digitisation of railway network and conventional civil engineering focused infrastructure enhancements. In combination these will provide enhanced capacity, improved service reliability and better customer information.

A purely conventional strategy to meet demand – focused only on construction-based enhancements such as building new tracks – would cost too much, disrupt for too long, and deliver too little. Ultimately, London can only achieve the capacity its economy demands by complementing targeted infrastructure upgrades with digital innovation that makes existing infrastructure more effective. In particular our plans include proven innovations in signalling and train control. Our conventional infrastructure proposals tend to be limited as a result to tackling capacity challenges at key junctions and stations.

A number of stations in the London area are seeing levels of crowding that are seriously affecting passenger comfort and, ultimately journey times, so investment in enhanced station capacity will also be necessary to accommodate growing demand.

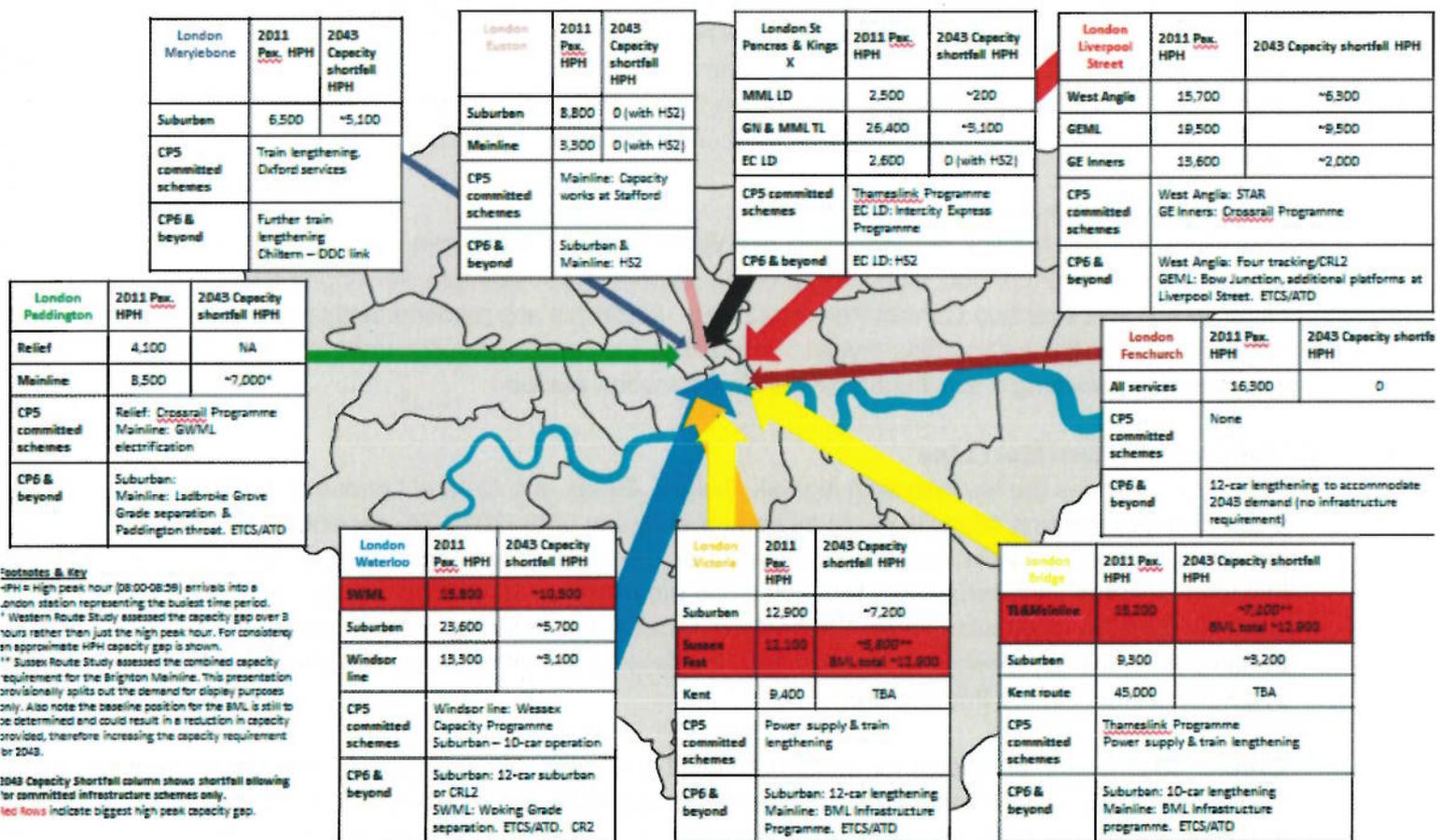
To help inform investment decisions, key Route Studies examining London rail services that have some of the greatest capacity challenges have been prioritised, along with capacity reviews of stations across the country. These Studies form part of the Industry's Long Term Planning Process (LTPP) and have been completed in partnership with Transport for London (TfL), the train operating companies on each route and the Department for Transport (DfT).

Summary of London and South East Priorities

The key gaps

Figure 1 developed with industry partners sets out the demand vs capacity gaps in the high peak hour on all National Rail routes into London. The map also references the solutions currently proposed for resolving the capacity challenges, and in some cases service reliability gaps. The section below describes the most important of these infrastructure/technology based schemes in more detail and their outputs. In all cases the demand gaps outside the high peak have also been considered.

Figure 1: London: High peak hour only: Capacity gaps



There is a growing difficulty of reliably operating the railway in London and the South East during the peaks given the volumes of passengers now using the railway. This challenge is most pronounced on the South West Main Line and the Brighton Main Line where, in the London area, trains and stations are becoming so congested that dwell times are being substantially impacted and the reliability of the operation compromised. It is Network Rail's view that investment in these Routes in the coming years will be necessary not just to avoid significant overcrowding, but also to avoid a deterioration in the reliability of these routes.

For each of these routes, a brief summary is provided below of the options available to release further capacity. In every case more detail can be found in Appendix A which also includes a link to each of the relevant Route Studies.

The South West Main Line:

This route provides the link between Dorset, Hampshire, Surrey and London. Options for releasing additional capacity are split over a two to three Control Period (2019 – 2030) timescale. CP6 proposals include improving Clapham Junction Station to relieve critical overcrowding on the platforms/underpass access and a flyover and additional platform at Woking to release capacity at the outer end of the route. CP6/CP7 proposals include roll out of the Digital Railway on the route with digital signalling critical to releasing the next tranche of Main Line capacity – up to 10 additional train paths per hour. Finally by the early 2030s the completion of Crossrail 2 will release further Main Line capacity and provide a step change in capacity and connectivity for south west suburban London.

The Brighton Main Line

This route provides the link between East and West Sussex, East Surrey, suburban South London and Central London. The integrated package of proposals for releasing additional capacity are split over two Control Periods (2019 - 2029) but are predominantly focused on the early 2020s. The key options involve remodelling the critical junctions north of East Croydon and providing 2 extra platforms at East Croydon station.

The Great Eastern Main Line

This route provides the link between Norfolk, Suffolk, Essex and Central London. The proposals for releasing capacity could all be deliverable in CP6 (2019-24) depending on the precise timing of Digital Railway implementation on the route. The integrated package includes rollout of digital signalling technology on the main line -providing substantial capacity benefits - particularly from Chelmsford inwards, the doubling of the single track bottleneck on the approaches to Norwich (at Trowse) and the introduction of a short section of additional track in the Witham area.

Greater detail on the proposals for each route into London are attached as Appendix A. These set out the level of industry involvement, appraisal processes used, key conclusions in terms of capacity gaps on the network, proposals for resolution, associated costs and where relevant business cases.

Key option outputs

Table 1 below sets out a high level summary of the key findings of the Route Studies in terms of options to resolve the most significant highlighted capacity gaps. The table also gives a sense of the level of additional seats to/from London during the peaks these routes could provide.

Table 1: Potential Outputs: Passengers. Peak direction of flow.

Service Group	Significant peak standing currently from:	Long term capacity gap*	Range of additional passenger capacity that could be delivered CP6	Range of additional passenger capacity that could be delivered CP7/8
South West Main Line (SWML) – Dorset, Hants, Surrey	Basingstoke/ Guildford (40 - 47 minutes out)	10,500 (high peak hour only)	-	4,600 – 9,300** (high peak hour)
Brighton Main Line (BML). Sussex, Surrey	Haywards Heath (50 minutes out)	12,900 (High peak hour only)	4,000 (high peak hour) 8,000 (3 hour peak)	8,000 (high peak hour) 16,000 (3 hour peak)
Great Eastern Main Line. Essex, Suffolk, Norfolk	Shenfield (30 mins out)	9,500 (High peak hour only)	2,400 (high peak hour) 4,800 (3 hour peak)	8,400 (high peak hour) 16,800 (3 hour peak)

*This represents the number of passengers in the high peak hour only that could not be accommodated on the route

** Does not include the additional suburban capacity – this is detailed in Appendix A

The options for the other key radial main line and suburban routes into London set out in Figure 1 are included in the Appendix.

Network Rail looks forward to working with the Commission and continuing to work closely with TfL and the DfT on the solutions to London's rail capacity and connectivity challenges.

3: Crossrail 2 – options to increase benefits and reduce costs

Crossrail 2 has the primary objective of improving public transport connectivity to key opportunity areas in London and the South East, promoting the economic growth in the region. The project will also address significant existing capacity constraints on the national rail network, particularly on the South West Main Line from London Waterloo, and the West Anglia Main Line from London Liverpool Street. The project is consistent with rail industry long term strategy set out in the London & South East Route Utilisation Strategy (RUS) of 2011, the recently established Wessex Route Study and the soon to be published Anglia Route Study.

Crossrail 2 is a substantial project with very significant benefits to the economy. Network Rail and TfL have agreed with the Commission to prepare a more detailed submission on Crossrail for 12th February 2016.

Yours sincerely,

A handwritten signature in black ink, appearing to read "Jo Kaye". The signature is fluid and cursive, with a large loop at the end.

Jo Kaye
Director, Network Strategy & Capacity Planning

National Infrastructure Commission
Call for Evidence

London's Transport Infrastructure
Nichols Response - January 2016



Question 3 – What are the opportunities to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Introduction

Crossrail 2 is a critical programme for London’s future economic and social sustainability. Its importance in solving the south-west commuter capacity constraints, unlocking land for affordable housing and its link to High Speed 2 at Euston, make it a regional and national priority delivering benefits beyond London. However whilst over half its estimated capital cost can be met by private funding sources the need for a strong Benefit to Cost Ratio (BCR) remains. Using our experience of numerous major rail and other infrastructure schemes, including 26 years working on Crossrail 1, we are pleased to have the opportunity to convey our thinking on how Crossrail 2 can increase its benefits, reduce its costs and meet its funding challenges.

A structured value management process to objectively challenge benefits and costs

The challenges can only be effectively addressed by adopting a structured and systematic value management (VM) process, which identifies solutions and objectively assesses them. We understand that TfL is leading this process, which should include other key stakeholders, including DfT, Network Rail, as well as its supply chain. Nichols staff led this approach on Crossrail 1, reducing capital cost to improve its BCR.

Opportunities to enhance benefits

The business case includes the transport, social, economic, regeneration and housing benefits. The VM process should ensure that each of these aspects are robustly challenged so that the wider, and sometimes less tangible, benefits in the business case are appropriately quantified and included. Conventional business case methodologies do not capture the transformational benefits associated with schemes such as Crossrail 2, nor the wider national benefits of supporting the growth of a global city. In this regard, Crossrail 2 could be used as a means of instigating a change to conventional business case methodologies.

Crossrail 2 can be used to further develop the proactive approach to realising socio economic development, seen on London 2012 Olympic and Paralympic Games and Crossrail 1, and should be positioned as a scheme benefiting the national as well as London economy. It should fund, in part, local representatives to act as brokers for opportunities with local suppliers for Crossrail 2. Therefore, the national economic supply chain benefits should be robustly reviewed. Creating a ‘push-pull’ effect in the regions is critical to ensuring robust advocacy for the Crossrail 2 in regional economies.



Crossrail 2 creates construction jobs and will support building a skills legacy; these are areas which require robust quantification and inclusion in the business case. Supply chain advocacy needs to be harnessed to ensure a weight of support for the scheme, ensuring a strong link with the Government’s transport and infrastructure skills strategy being led by Terry Morgan.

We previously convened a “Creative London Crossrail 2 initiation seminar” which included key stakeholders to Crossrail 2, as well as those involved in Crossrail 1 and other major programmes. A key theme which emerged from this seminar was the importance of any scheme having ‘strategic anchors’. In part, Crossrail 2 has these strategic anchors in relation to important developments at Euston (with HS2), Clapham Junction (through its proximity to Nine Elms development) and Wimbledon as an emerging opportunity area. However, unlike the Jubilee Line Extension and Crossrail 1, where the links to Canary Wharf were key anchors, Crossrail 2 does not appear to have such a key anchor. This is important from an economic justification perspective, and for leveraging private funding. We therefore recommend a review of Crossrail 2 route and station locations to take account of likely post Crossrail 1 centres of economic activity.

An alternative approach would be to build those parts of the railway that are mainly intended to link to new housing only when there is demand, similar to how the Metropolitan line expanded over an extended period. Where the business case is not strong, for example, the new Southgate branch, demand could be demonstrated by a substantial contribution from the housing developers who could be encouraged to progress developments through efficient use of the Mayor’s planning powers. A similar approach occurred on Crossrail 1 at Woolwich, which only acquired a station when a developer contributed to its costs, in turn linking the development to obtaining planning consents for a large housing scheme. The sale or lease of development land could also be used to generate capital or revenue receipts to off set costs.

Benefits can also be enhanced by designing additional functionality from the start. For example, full integration of oversite and associated urban realm developments, geothermal heat recovery or protected duct routes for voice and data connectivity, which could generate long term revenue streams.

Opportunities to reduce costs

Opportunities to reduce cost in a generic sense will already be well recognised, including: reducing risk; improving incentivisation of suppliers; use of standardised designs; benefits of off-site manufacturer; application of BIM as a single source of truth; and value engineering of high risk and sensitive locations (such as shafts).



From our involvement in the planning and delivery of major rail and other infrastructure programmes, we recommend exploring the following additional ideas to reduce cost:

- EU procurement regulations impose an unnecessarily constraint, they do not provide adequately for the acquisition of a Programme. Each ‘call for competition’ is independent and cannot sufficiently allow for externalities that in practice erode value and build in redundant costs. We would advocate exploring opportunities to create an entity which is classified as ‘private’ and therefore does not need to comply with EU procurement regulations. The obligations of transparency and prevention of fraud and corruption would still be maintained to ensure fair and equitable competitions.
- The development and management of the outer areas works, on the existing rail network, should be fully integrated with the management and development of the core route. This would be maintained under TfL’s overall leadership ensuring that all activities are integrated and opportunities to challenge scope, reduce risk and drive economies of scale are taken.
- Ensuring that wider industry opportunities to reduce risk and enhance value are taken in a system-wide structured manner. For example, ensuring that the DfT, as franchising authority, factor into the South West trains franchising process the potential for Crossrail 2’s impact on the network. In a similar vein, our work on the Thameslink Franchise ensured that the TOC would play a key role in delivering and facilitating the programme through both contractual obligations and aligned incentives with Network Rail and the train service provider.
- Phasing should be explored, as an incremental approach to delivery may result in efficiencies. There is evidence from Madrid and other successful metros of keen pricing from such approaches.
- Different delivery models should be considered, particularly for off-network aspects of scope such as depots and stations. Depots and rolling stock could be privately financed, generating affordability benefits which could assist the programme’s Benefit Cost Ratio.
- From our experience of Crossrail 1, cost reduction opportunities exist through innovation, and the programme must proactively seek to generate, capture and deploy innovation. This innovation should be delivered through a platform similar to Innovate18 or a discrete Innovation Engine.
- Procurement efficiencies through smart packaging and building a liquid supply chain. On Crossrail 1, the use of larger construction packages generated savings and reduced interface risk.



Nissan response to the National Infrastructure Commission call for evidence

Nissan will provide a response that focuses on two questions of the questions that have been asked around the report regarding transport infrastructure in London. These are:

- 1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?**
 - 2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?**
- *How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?*
 - *What might their potential impact be on employment, productivity and housing supply in London and the southeast?*

London report response

One of the main social challenges London faces, and will continue to face over the coming decades, is improving air quality in a city that is expected to grow from its current record population high of 8.6 million, to 11 million by 2050.¹ While estimates vary, some studies show that air pollution in the UK currently kills over 35,000 people every year.² The UK exceeds EU limits on NO₂ pollution, and because of its size London is by far the most polluted city. Around 80% of the NO_x emitted in London comes from transport; for a cleaner, healthier London, improving emissions from vehicles is therefore vital.

At the heart of the strategy to improve transport emissions is the transition to Ultra Low Emission Vehicles (ULEVs). ULEVs emit much lower levels of NO_x and CO₂, and pure Electric Vehicles like the Nissan LEAF have zero tailpipe emissions – zero NO_x and zero CO₂. TFL's Ultra Low Emission Zone delivery plan of June 2015 sets out to make London the ULEV capital of Europe. This is both welcome and necessary. Not only does London currently fail to meet EU legal limits for nitrogen dioxide, but there is also much more to do on CO₂ if we are to meet the internationally agreed targets set at COP21 in December 2015. Investing in the necessary charging infrastructure to support ULEVs will therefore help improve air quality – and consequently public health – whilst also helping the UK meet our carbon emissions targets.

TFL's ULEZ delivery plan also makes the point that the "green economy" is a rapidly growing industry; investing in the right infrastructure to support ULEVs not only improves the air we breathe, it is an investment in the jobs of the future.

TFL have combined with the GLA to look at potential ULEV uptake in London. There have been more than 30,000 ULEVs purchased in the UK to date and the last 2 years has seen a surge in market

¹ <http://www.bbc.co.uk/news/uk-england-london-31082941>

² <http://alumni.kcl.ac.uk/page.aspx?pid=4358>

growth. Even the “baseline scenario” projections show a 25-fold increase in ULEV cars in London in the next 10 years.³

To cope with this anticipated increase in demand London’s electric vehicle charging infrastructure needs improvement. ULEV users must have the confidence that they will be able to easily recharge across the city. Nissan appreciates that TFL is currently undertaking research to best understand what infrastructure will be needed to support ULEV uptake; Nissan would advise the commission to follow this research closely in their work. However without wishing to pre-empt this study, Nissan would suggest that as the areas of Old Oak Common and the industrial Park Royal site in West London are regenerated as part of the introduction of HS2 and Crossrail, electric chargers should be installed. Indeed Nissan believes that the installation of chargers – preferably rapid chargers - should be standard for any future regeneration project in London and recommends that planning authorities should require investment in charging infrastructure as part of any major housing developments in the capital.

However most importantly TFL must have the resources they need from Government to provide the necessary infrastructure. This is required on a large scale to achieve the improvements in levels of NOx and CO2 that the UK is legally obliged to. Whilst public transport, walking and cycling will continue to play an increasing role in London’s transport landscape, and investment in large scale public transport projects like Crossrail 2 is necessary, it is important to remember that 1 in 3 journeys are still made by private transport.⁴ For many businesses private cars and vans will remain the only way of operating. The transition to ULEVs will therefore make sure businesses can continue to operate as they currently do, enabling economic growth and improving productivity, whilst ensuring the UK meets its legal obligations to drive down emissions and improve public health. The Government’s stated ambition is that by 2050 almost every car and van in the UK will be an Ultra-Low Emission Vehicle – this ambition must be backed by the resources to enable the roll out of a reliable and easily accessible charging infrastructure across London.

³ <http://content.tfl.gov.uk/ulev-delivery-plan.pdf>

⁴ <http://content.tfl.gov.uk/ulev-delivery-plan.pdf>

1. Introduction

- 1.1 Peabody was established in 1862 by the American banker and philanthropist, George Peabody. Our mission is 'to make London a city of opportunity for all by ensuring that as many people as possible have a good home, a real sense of purpose and a strong feeling of belonging.'
- 1.2 We work solely in London, with a presence in the majority of London boroughs. We own and manage around 28,000 homes, providing services to over 80,000 Londoners. This is set to grow with over 8,000 new homes planned across the capital.
- 1.3 As well as bricks and mortar, we provide community programmes for the benefit of our residents and for people living in the surrounding neighbourhoods. We support over 23,000 hours of free-to-access community activities each year. This work aims to tackle poverty at its roots, supporting people to transform their lives and communities for the better.
- 1.4 Peabody is growing and has ambitious plans for the regeneration of Thamesmead, south east London. For the first time in a generation, the organisations responsible for housing, land and community in this area have been brought together into a single, well-resourced organisation. Over the next 10 years we will work with partners and local people to translate our vision of a mixed, economically active and vibrant Thamesmead community into reality.
- 1.5 Developing London's transport infrastructure is essential in order to deliver a major uplift in housing delivery and create significant economic benefits to regeneration areas. We believe that Peabody's role in Thamesmead presents one of the biggest opportunities to tackle London's housing crisis. Thamesmead has the potential for between 15,000 and 20,000 new homes, as well as 6,000 to 8,000 new jobs. Fulfilling this potential will depend on the provision of new transport infrastructure, particularly new river crossings and extension of the DLR from Gallions Reach.
- 1.6 New river crossings and extension of the DLR from Gallions Reach are crucial to delivering the full potential of Thamesmead. They will enable a step change in the connectivity of public transport for those living in parts of central and north Thamesmead and have the potential to act as a catalyst for attracting external investment. We ask the Commission to recognise the growth potential of Thamesmead and the potential for a major uplift in housing delivery through new river crossings and a DLR extension.
- 1.7 Our response relates to Section 3 of the call for evidence, 'London's transport infrastructure'. We have chosen to respond to questions 1 and 2 of this section as these most closely relate to Peabody's core purpose and future plans.

2. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

Summary

- London requires a major uplift in housing delivery in order to address the current housing crisis and to secure the city's future growth.
- We believe that Peabody's role in Thamesmead presents one of the biggest opportunities to tackle London's housing crisis. Thamesmead has the potential for between 15,000 and 20,000 new homes, as well as 6,000 to 8,000 new jobs.
- New homes must include a mixture of tenures in order to effectively meet housing need in London and must be integrated with new and existing infrastructure (e.g. schools, health, community and transport) in order to create successful and sustainable communities.

Population Growth

2.1 London's population is currently growing at a rate of around 100,000 people a year and recently reached a record high of 8.6 million people.¹ Continued population growth is expected to occur over the next two decades with London's population forecast to reach 10 million people by 2030.² This population growth has mostly been driven by natural replacement and international migration.

2.2 Peabody recognises the continuing growth in London's population and works closely with the GLA, local authorities, private developers and other housing associations to increase the number of homes available for Londoners. We are also committed to ensuring homes built are connected to the social infrastructure that allow them to make great places to live. This includes educational facilities, health services and community amenities, as well as transport links.

Economic Growth

2.3 London's population growth is fuelled by a strong economy. The city's economy grew by almost 30% over the five years to 2014.³ London creates almost 200,000 new jobs annually⁴ and the median weekly wage for full-time employees in London is £132 per week more than the UK average.⁵

2.4 London's job growth is forecast to continue over the coming decades, particularly in high skill sectors, such as professional services and technical activities. Continued employment growth is also forecasted in low skill sectors, such as retail and social care, which can have limited opportunities for career progression and wage growth. This has resulted in a polarisation of the city's labour market and led to some research suggesting London is the most unequal city in the UK with regards wage inequality.⁶

¹ Source: GLA, *London population confirmed at record high* (2015)

² Source: Mayor of London, *The London Strategic Housing Market Assessment* (2013)

³ Source: ONS, *London leads UK cities in economic recovery* (2015)

⁴ Source: Mayor of London, *The London Strategic Housing Market Assessment* (2013)

⁵ Source: ONS, *Annual Survey of Hours and Earnings* (2015)

⁶ Source: JRF, *Wage inequality and employment polarisation in British cities* (2013)

- 2.5 It is anticipated that much of London’s future population growth and economic growth will take place in the east, especially in Opportunity Areas such as Thamesmead. This is because these areas have a greater supply of developable land, including brownfield sites, and significantly cheaper land costs. However, areas such as Thamesmead have also been historically underserved by London’s transport infrastructure. The GLA has recognised this and recently launched their City in the East plan to enable the provision of critical infrastructure necessary to support future growth in housing and jobs.
- 2.6 Given the challenges in London relating to the availability of land, we strongly believe that Opportunity Areas such as Thamesmead present one of the biggest opportunities to tackle London’s housing crisis. See point 3 for further information on the opportunity presented by Thamesmead.

Housing (Under)Supply

- 2.7 London’s housing supply has persistently failed to match its population growth leading to the situation popularly characterised as a “housing crisis”. At least 49,000 additional new homes are required in London annually over the next two decades to meet housing need,⁷ whilst just 21,000 new homes were completed in London over 2014/15.⁸ This undersupply of homes has been attributed to a range of causes, including constraints within the planning system, the availability and high costs of land, access to finance, and the make-up of the house building sector.
- 2.8 It is forecast that nearly half of the homes required in London over the next two decades will be for market rent/sale, one in five will be for low cost home ownership, and a third will be homes for social rent. London’s annual housing requirement also includes 5,000 homes a year to address backlog housing need among households currently living in unsuitable accommodation.⁹
- 2.9 Peabody strongly believes that London needs a mix of housing tenures to effectively tackle the housing crisis. Although we welcome the government’s planned investment in house building, we are concerned that current policy has insufficient emphasis on the demand for new affordable homes to rent. We remain committed to developing high quality new homes across a range of tenures, including social/affordable, as well as homes for rent and sale on the open market. Peabody’s recent housing developments, such as Chambers Wharf in Southwark, Mint Street in Tower Hamlets, and Pembury Circus in Hackney, all demonstrate this commitment.

Housing Affordability

- 2.10A long-term shortfall in housing supply has led to significant increases in house prices. This has been apparent over recent decades in which London’s house prices have increased much faster and higher than in other parts of the UK. London’s average house price has more than doubled since the late

⁷ Source: Mayor of London, *The London Strategic Housing Market Assessment* (2013)

⁸ Source: Ibid.

⁹ Source: Ibid.

1990s and trebled since the mid-1980s.¹⁰ The average house price in London is currently £531,000, having risen by over 7% over the last 12 months. This is £245,000 higher than the rest of the UK.¹¹

2.11 House prices in London have risen much faster than earnings since the recession. London's average house price is currently sixteen times average earnings, compared with a ratio of 11:1 in the rest of the UK. This has created a significant problem of affordability, especially for aspiring home owners, and has increased demand for rented housing.

2.12 Average rental costs in the private rented sector are higher in London than other UK regions and have grown by over 4% over the last 12 months.¹² The median private rent in London for 2014/15 was £1,350 per month, compared with just £600 per month on average across England.¹³

2.13 The high costs of rent and home ownership have created affordability problems for many households, especially large families. One key consequence of this is the extent to which social diversity has been impacted, with many individuals on low-to-middle incomes being effectively priced out of living in many parts of London, especially inner London. This also affects the ability of employers to recruit workers in key professions due high housing costs. A recent CBI survey found that 61% of the capital's firms list housing costs and availability as having a negative impact on the recruitment of entry level staff, with half listing it as an issue for recruiting mid-level managerial staff.¹⁴

Transport Infrastructure

2.14 The continued growth of London places a higher level of demand on existing social and physical infrastructure, including transport. London's future population growth depends not just on the provision of new homes and jobs but also on the provision of sufficient transport capacity and connectivity to effectively link new homes with jobs.

2.15 Through addressing the pressures faced by London's transport infrastructure we could better support London's continued economic growth through productivity gains and job growth. Such improvements would also help to drive new housing development and regenerate key opportunity areas, such as Thamesmead. The use of transport infrastructure to drive growth across London is well established through initiatives such as the Northern Line Extension to Battersea, where 18,000 homes will be built in the GLA led Vauxhall Nine Elms Opportunity Area.

¹⁰Source: Ibid.

¹¹ Source: ONS, *House Price Index*, (2015)

¹² Source: ONS, *Index of Private Housing Rental Prices* (2015)

¹³ Source: VOA, *Private rental market statistics* (2015)

¹⁴ Source: CBI, *London Business Survey* (2014)

3. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

Summary

- Developing London's transport infrastructure is essential in order to deliver a major uplift in housing delivery and create significant economic benefits to regeneration areas.
- We believe that Peabody's role in Thamesmead presents one of the biggest opportunities to tackle London's housing crisis. Thamesmead has the potential for between 15,000 and 20,000 new homes, as well as 6,000 to 8,000 new jobs. Fulfilling this potential will depend on the provision of new transport infrastructure, particularly the extension of the DLR from Gallions Reach.
- New river crossings and extension of the DLR from Gallions Reach are crucial for delivering the full potential of Thamesmead. They will deliver a step change in the connectivity of public transport for those living in parts of central and north Thamesmead and have the potential to act as a catalyst for attracting external investment.
- Peabody asks the Commission to recognise the growth potential of Thamesmead and the potential for a major uplift in housing delivery through the delivery of new river crossings and a DLR extension.

Thamesmead's growth potential

- 3.1 Thamesmead is a part of the GLA 'City in the East' Plan. Originally conceived as a new town for the 21st Century, Thamesmead has experienced mixed fortunes since the first families moved in in 1968. Many parts of Thamesmead have suffered from inconsistent governance, investment and management and it still suffers from poor connectivity and accessibility, exacerbated by an historic lack of transport infrastructure investment in comparison to other areas of London.
- 3.2 The poor provision of transport infrastructure has constrained development potential and the vitality of existing communities and employment areas. The locality has relatively low levels of income compared to the rest of London (for example, average household income in South Thamesmead is £37,652pa in comparison to an Outer London average of £48,530pa) and is in need of economic regeneration.

Peabody in Thamesmead

- 3.3 In 2014 the major landholdings and corporate responsibilities for Thamesmead were transferred over to Peabody, putting us in a unique position to facilitate a process of transformational change for the area. We have ambitious plans to regenerate the area into a high quality place to live, work and visit.
- 3.4 We have worked with Royal Borough of Greenwich and London Borough of Bexley to secure government investment into Thamesmead through the establishment of two Housing Zones, in addition to our own substantial investment. Working with our partners we are committed to delivering thousands of high quality affordable homes, with the first homes being delivered in the next five years.
- 3.5 Peabody is clear that Thamesmead is a community with huge growth potential and we have demonstrated our ambitions by committing to delivering a substantial regeneration programme.

Funding commitments from the two Housing Zones and other sources of investment are expected to result in £1.4bn worth of investment in the regeneration of Thamesmead. However, the full development potential of Thamesmead can only be unlocked with enhanced public transport and substantial investment in transport infrastructure.

- 3.6 The arrival of Crossrail to Abbey Wood in 2018 will significantly improve public transport accessibility for South Thamesmead and will enable the regeneration of key neighbourhoods around the station. However, strategic transport connections are still lacking across much of central and northwest Thamesmead. In order to maximise the impact of Crossrail and the development opportunity of the whole of Thamesmead, a co-ordinated programme of transport investment is required.
- 3.7 New river crossings, a DLR extension and improved local transit connections will deliver a major uplift in housing delivery in Thamesmead. Crossrail will bring 25,000 residents in Abbey Wood/South Thamesmead closer to central London with the ability to reach Canary Wharf in 11 minutes and Tottenham Court Rd in 24 minutes. This however, will not significantly improve the connectivity of 15,000 residents of North and Central Thamesmead (due to slower connections to Abbey Wood station), nor will it allow Peabody to bring forward significant land holdings for development in North Thamesmead.
- 3.8 The London Plan currently identifies a possible 3,000 new homes which are deliverable in Thamesmead, whereas the work Peabody has done with the GLA/TfL and the two Boroughs demonstrates the potential of between 15,000 and 20,000 new homes, as well as associated commercial development, including a new town centre for Thamesmead, if the requisite transport infrastructure can be provided. Clearly, transport infrastructure can more widely benefit an area than simply resolve transport problems.
- 3.9 New river crossings will be essential to attract the necessary investment to fulfil the development potential of Thamesmead. The increased connectivity will ensure Thamesmead becomes an integral part of London, providing the right conditions for attracting private sector investment in both residential and commercial developments.

Potential for further growth – key transport interventions for Thamesmead

3.10 Peabody's vision for Thamesmead is the creation of first-class transport connections that provide excellent connectivity into central London, to the wider region, opening up new routes into Kent, and within Thamesmead itself. This will unlock future development sites and encourage a greater level of investment within the area. We have identified the following key transport interventions:

- (1) River crossings:** A new river crossing at Gallions Reach would enable the comprehensive development of Peabody controlled sites in north and central Thamesmead, including Tamesis Point and the town centre. The crossing would play a key role in unlocking development potential, enhancing values and deliverability, and enabling residents to access employment opportunities in key employment locations such as the Royal Docks and Canary Wharf.

Our preferred option for the river crossing at Gallions Reach is a tunnel. We believe that a tunnel would have a number of advantages over a bridge as this would have a lesser impact on nearby residents and would enable the development of a higher volume of new homes compared to a tunnel. Peabody will be further outlining our case on this matter in the TfL river crossings consultation.

A new crossing at Belvedere would also support businesses, job creation and housing delivery for local people. It would also improve business productivity and output as a result of better connectivity, agglomeration and increased competition (see *Figure 1 below*).

Figure 1. River crossings

Indicative plan showing proximity of major development sites in Thamesmead to proposed Gallions Reach and Belvedere river crossings.



- Key
-  Existing rail network (and Crossrail to Abbey Wood from 2018)
 -  Proposed river crossings and strengthened public transport routes

(2) DLR: The extension of the DLR Beckton branch to Thamesmead over Gallions Reach crossing would transform the accessibility of north and central Thamesmead, improving local journeys and creating connections to areas of economic growth in Docklands. It would also act as a catalyst to the comprehensive development of key strategic sites increasing the ambition, deliverability and development potential of these sites. There is potential to achieve a further

extension from central Thamesmead towards Belvedere which would also be of major benefit to housing and employment sites in Bexley and Thamesmead.

We believe that the potential number of new additional homes which would be enabled by an immersed tube DLR transport option at Gallions Reach has so far been underestimated. Our estimates suggest that this option would enable the delivery of 7,800 new homes within the vicinity of the DLR station, with the potential for more depending on densities.

A DLR extension from Beckton to Thamesmead would also reduce journey times from the Town Centre to Bank (from 59 minutes down to 32 minutes) and to the Royal Albert Dock (from 64 minutes down to 8 minutes), thereby opening up accessibility to jobs and linking key development schemes north and south of the river (see Figure 2 below).

Figure 2. DLR Extension

Illustration of DLR extension providing a direct link from central Thamesmead to the Royal Docks, Canary Wharf and the City.



- Key
- Existing DLR
 - Existing rail network
 - Crossrail to Abbey Wood from 2018
 - - - Proposed DLR extension
 - - - Proposed river crossing at Gallions Reach and improved public transport route
 - - - Potential future phases of DLR extension (indicative routing)
 - - - Improved connections from Woolwich/Plumstead to Abbey Wood and LB Bexley

(3) Overground extension: The extension of overground services from Barking would connect the area into a new orbital network of outer London centres for the benefit of central Thamesmead and Bexleyheath. An extension of Crossrail to Ebbsfleet would also be beneficial in the long-term (see Figure 3 below).

Figure 3. Overground extension

Illustration of the Overground extension providing a link from the Crossrail station at Abbey Wood to central Thamesmead and Barking Riverside.



- Key
- Existing DLR
 - Existing rail network
 - Crossrail to Abbey Wood from 2018
 - - - Potential future Crossrail extension to Ebbsfleet
 - Potential London Overground extension from Barking Riverside to Abbey Wood
 - - - Potential London Overground route via Thamesmead town centre and Bexleyheath

(4) Local transit (east to west): Improved transit connections in the form of tram or enhanced bus services would play a vital role in improving local journeys from east to west between Woolwich and Abbey Wood. Other connections or interchange could be achieved via the new river crossings to connect into the Royal Docks and London Riverside.

(5) River bus: An extension of river bus services from Woolwich via Tamesis Point/Thamesmead Town Centre and beyond would provide a further connection to a number of destinations in central London.

4. Conclusion

- 4.1 Peabody welcome further opportunities to contribute to the debate on London's transport strategic challenges. We ask the Commission to recognise the growth potential of Thamesmead and the potential for a major uplift in housing delivery through the delivery of new river crossings and a DLR extension.
- 4.2 Since our merger with Gallions in 2014 we have committed substantial investment in development work and detailed studies identifying the overall potential of Thamesmead. We would welcome discussions with the Commission and TfL in regards to future pieces of work, particularly relating to new river crossings and a DLR extension.

For further information, please contact:

[contact redacted]



PENSION INSURANCE
CORPORATION

*Response by Pension Insurance Corporation plc to the National
Infrastructure Commission call for evidence*

8 January 2016

Contact:
[contact redacted]

Pension Insurance Corporation does not regard any of the information in this document as confidential.

Introduction

Pension Insurance Corporation plc (PIC) provides tailored pension insurance buyouts and buy-ins to the trustees and sponsors of UK defined benefit pension funds.

Clients include FTSE 100 companies, multinationals and the public sector. At year-end 2014 PIC had a portfolio of £13 billion and approximately 30% of this, or about £4 billion, was invested in infrastructure debt. PIC now has more than £16 billion in assets. The vast majority of the balance is invested in investment grade corporate bonds, UK Government debt and cash.

PIC is authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and Prudential Regulation Authority (FRN 454345).

For further information please visit: www.pensioncorporation.com

Our interest in this consultation

As a specialist pension insurer with liabilities analogous to those of a defined benefit pension fund, we look to buy and hold assets which provide long-term, stable cash flows which match the underlying liabilities of the pension schemes we insure. The regulatory environment is driving demand for these cash-flows to come in the form of investment grade debt. Our

portfolio is therefore principally invested in assets such as UK government debt, corporate bonds and cash.

One of the key facets of our portfolio is the very long-term, non-callable nature of the liabilities insured by PIC. This means we can invest in illiquid assets which are, by definition, hard to sell. A good example of this is infrastructure debt.

Infrastructure debt can offer investment grade, inflation-linked, long-term cash flows to match liabilities. It offers high recovery rates even in default, above similarly rated corporate bonds. An increase in availability of this type of investment would allow more pension liabilities to be matched. Given there are around £2 trillion of corporate defined benefit pension liabilities in the UK, there will be substantial demand for assets.

However, the UK is suffering from a major “infrastructure gap”, in that there are huge infrastructure demands within the economy and increasingly interested and cash-rich institutional investors, such as PIC, yet a dearth of suitable investments, notwithstanding the plans for the ‘Northern Powerhouse’.

A more stable and strategic approach to infrastructure planning and delivery by government would go a long way to helping grow GDP and produce secure investments at attractive yields for pension funds, insurance companies and other UK institutional investors.

We welcome the creation of the National Infrastructure Commission (NIC) as a step towards improving the investment environment and welcome this opportunity to contribute to the public discussion about infrastructure.

We believe a key objective of the NIC should be to build and then maintain a healthier ongoing dialogue between infrastructure planners and the UK funding markets. In our view there has been a strained relationship in the past, which is now improving. As institutional investors become an increasingly important part of the funding equation, there is a real opportunity now for a more collaborative approach.

As natural lenders we want government to understand what is important for us and to above all ensure consistency in its approach. The key aspect for long-term investors is long-term certainty and visibility of the cash-flows.

Most infrastructure projects are long term in nature, so the governance needs to reflect this.

This in contrast to short term political cycle so the governance needs to be de-politicised as far as possible, something we considered as part of a detailed study of UK infrastructure we undertook with Llewellyn Consulting in 2013.¹

This de-politicisation of the process has been done before with the removal of interest rate setting to the Bank of England.

¹ <https://www.pensioncorporation.com/news-media/news/pension-insurance-corporation-launches-white>

The NIC is able to take a longer view and create greater certainty for all interested stakeholders – consumers, construction industry, other industry participants such as facilities management companies, local government and the financing market.

This could be a win-win situation for the UK, a serial under-investor in infrastructure. At a time when the need for infrastructure investment has never been greater and the desire of institutional investors is correspondingly strong, it is time to ensure that these pools of money can be put to work rebuilding Britain.

The role of governmental bodies must be to facilitate the development of private capital funding, not replace it except when a project is not viable without governmental support or subsidised funding. They need to act as facilitators of projects and they can use guarantees and involve supranational bodies in the financing.

As noted, there is a very large demand for long dated high quality assets from UK institutions. Yet there is also a real ongoing risk of crowding out by supranational issuers such as European Investment Bank, who are able to offer cheaper debt.

An excellent example of successful facilitation by the government was Mersey Bridge, where the deal only obtained finance because of the Government's guarantee.

We confine our comments only to those areas in which we have a particular interest and expertise, namely those that relate to the governance and financing of infrastructure projects.

PIC is a consistent innovator in the field of infrastructure investment

- PIC invested in the first-ever UK Solar Bond financing in November 2012.
- PIC invested in Salford Pendleton Social Housing PFI debt which had project bond credit enhancement via mezzanine financing – this was before the European Investment Bank (EIB) had placed their first deal within the UK with a similar financial structure.
- PIC adopted a deferred funding model, where funding is being drawn down over three years in line with the construction profile, with its North Tyne social housing PFI transaction.
- PIC lent £70 million to the Church of England Pensions Board, which operates the Church's retired-housing scheme, in a new source of long-term financing for the Church housing scheme. The bond is the first ever Sterling issue with the coupon but not the principal linked to CPI and represents a step forward in the CPI linked bond market.
- PIC invested £75 million in debt issued by Virgin Atlantic Airways, secured on its portfolio of landing slots at Heathrow, the first time that this type of transaction has been completed.
- PIC has invested more than £1 billion in bilateral infrastructure transactions in sectors including utilities, transport, renewables, social housing, PFI and student accommodation.
- PIC has been involved in loan and bond funding for a number of primary deals, including investing in over £400m of transactions that have significant greenfield or construction risk.
- PIC has been involved in funding consortia for transactions working alongside banks, other insurance companies and other leading counterparties active within infrastructure in the UK.

- PIC provided around £150 million of funding as the key investor for two PFI bonds in Greater Manchester providing funding for Salford City Council to begin regenerating more than 1200 homes in the city and then funding for Manchester City Council to begin regenerating more than 1100 homes in the Brunswick area of the city.
- PIC is invested in long-dated fixed, floating and inflation-linked debt and works closely with borrowers to offer their preferred funding solution.

Connecting northern cities

What form of governance would most effectively deliver transformative infrastructure in the north, how should this be funded and by whom, including appropriate local contributions?

GOVERNANCE

The importance of governance

From an investor perspective, strong governance that brings long-term certainty and visibility of the cash flows is critically important, as it helps ensure:

- investment programmes have public support, therefore minimising the risk of policy reversal or abandonment;
- taxpayers receive value for money, underpinning the fiscal credibility of investment programmes;
- private investors have sufficient confidence in project management to provide early stage equity finance;
- where applicable, infrastructure assets are economically viable such that private investors can purchase bonds at project maturity;
- where there are guarantees or tariff regimes they will not be altered.

Key investor infrastructure investment governance issues

Certainty is important because investing in infrastructure is a complex area. This complexity is a significant barrier for many pension funds. It takes time and effort to build up the expertise and partnerships necessary to successfully invest in this area. Investors need to have the resources and ability to analyse:

- Credit issues
- Structure deals
- Price deals

They need to be confident that the time they spend looking at an opportunity and the effort expended in acquiring skills and resources to analyse the deal will be worth it. A lack of certainty in the process can undermine the desire of certain types of institutional investor, in particular pension schemes, to invest in infrastructure.

Championing infrastructure programmes

Agreed national infrastructure priorities could be championed more aggressively, perhaps using the 2012 London Olympics as a model for successful delivery. That was a large, complex, and diverse project, that involved numerous layers of planning and the engagement of all levels of government, and which at its completion generated numerous saleable assets.

In the case of the Northern Powerhouse, a similar delivery authority could be created. Due to the nature of the initiative, and the devolution of power to local level, city and local authorities would have to be formally recognised in the development and implementation of any plans.

Clear long-term plans with political buy-in are an absolute necessity

A delivery authority is of little benefit if there is no clarity about what precisely it is supposed to be delivering. This underlines the importance of a coherent infrastructure plan which is both technically sound and based on a rational assessment of present and future needs. We feel that the National Infrastructure Plan fell short of providing this, but the NIC's National Infrastructure Strategy could address these shortcomings, although we note that five years is still only one political cycle.

Features which we think are essential in governance structures at regional or national level are as follows:

- co-ordinated across different departments and levels of government (including local and city governments);
- devoid of frequent policy reversal and prevarication over key decisions;
- supported by regulatory stability (especially in relatively regulation heavy sectors such as energy and utilities); and
- dovetailed with the ability of construction firms to supply the necessary resources to do the job.

The role of the National Infrastructure Commission in governance

We welcome the creation of a National Infrastructure Commission and this consultation. The NIC has an opportunity to bring the long-term thinking and clarity that appears to have been lacking in UK infrastructure policy its National Infrastructure Strategies. The creation of a predictable project pipeline with delivery timelines would significantly enhance the infrastructure investment environment in the UK – including, crucially, in the North and bring strategic, long-term benefit to the UK economy.

London's transport infrastructure

What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2? What innovative funding mechanisms could be considered to support delivery of key schemes?

Is funding for London infrastructure projects a special case in the UK?

As an institutional investor, our views about the funding of large projects in London are similar to those relating to the funding of infrastructure in the North. However, the scale of the London economy and its global profile - along with greater devolved powers - does give London more scope to direct its own infrastructure priorities and potentially to fund them than other regions.

Initiatives such as the London 2050 strategy include practical steps to help make infrastructure planning and delivery easier through tools such as the Infrastructure Mapping Application. This shows the role that local and regional government can have as an enabler of investment as well as a policy maker and funder.

We believe that the NIC should have oversight of, and offer strategic guidance on, all major infrastructure projects including those in London – particularly since certain London infrastructure projects are of strategic national importance. Crucially, this will require partnership between the GLA, London Boroughs and the NIC. It is important that local government has a strong say in infrastructure projects, but equally projects must fit within a coherent national framework to avoid duplication and to ensure road, air, rail and sea transport are integrated in a way that serves the national economy.

We don't offer views on the how costs to taxpayers should be distributed as this is a political question – though there is logic to the view that those that benefit the most from improvements to infrastructure should bear a greater proportion of the costs of its provision. For this reason further consideration should be given to what fiscal and policymaking powers can be devolved to London authorities.



**National Infrastructure Commission
Call for Evidence:
London Evidence**

**A Response by the Pensions
Infrastructure Platform (PiP)**

January 2016

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Executive Summary

The issue of pension funds' investment in infrastructure cannot be looked at in isolation from the wider economy and, specifically, the role of defined benefit (DB) pension provision. Despite the gradual decline of DB pension provision in recent years, over a third of the UK's workforce is still accruing benefits in a DB scheme, with schemes themselves managing over £900bn of assets. It is therefore crucial that employers sponsoring DB schemes can meet their obligations to scheme members without facing undue impact on their ability to invest elsewhere in the economy.

In order to match their long term pension payment obligations, provide security for scheme members and reduce the risk of volatile cash contributions from scheme sponsors, pension schemes need investments that generate long term, consistent, low-risk, inflation-linked cash flow returns. Core infrastructure, including transportation system assets, can be a great source of these long term, low risk cash flows. Unlocking institutional investment into infrastructure on a large scale would also be highly beneficial to the economy.

However, achieving increased investment into infrastructure depends a great deal on the predictability of the returns that will be generated over the longer term. For transport assets, this predictability principally relates to the political and regulatory regimes the assets will be operating under, the level of any subsidies that may be paid and the usage revenues that will be obtainable.

Predictability in these areas is needed from start to finish – from the initial stages of project consideration – to make it worthwhile for pension schemes to incur the bidding and project development costs and to arrange long term funding – right through to operation.

Any reduction in long term predictability, whether real or perceived, increases the overall project risk for an investor, pushes up the level of returns required to reward the taking of that risk and therefore makes projects more expensive.

We believe that the definition of clear long term goals which form the basis for a coherent long term plan is the best way to provide confidence to pension scheme investors, developers and operators. Such a plan should also include transparent and predictable mechanisms for evolution to reflect changes in the external environment and to facilitate responses to unanticipated market or technological developments.

Overview of PiP Response

Introduction

1. The Pensions Infrastructure Platform ("PiP") is the UK infrastructure investment business set up "by pension funds for pension funds". Its objective is to facilitate investment into UK infrastructure projects by UK pension schemes, by developing investment vehicles which meet their needs in terms of structure, returns and cost.
2. PiP was established in 2012 following the signing of a Memorandum of Understanding by the National Association of Pension Funds ("NAPF"), the Pension Protection Fund ("PPF") and HM Treasury. The development was supported by 10 of the UK's largest defined benefit pension schemes.
3. PiP's first investment fund was launched in 2014. It is managed by Dalmore Capital and invests in PPP equity. The second fund invests in small scale (sub 5MW) rooftop solar PV installations. This was launched in February 2015 and is managed by Aviva Investors.
4. PiP has also worked with Dalmore on the successful consortium bid to construct and operate the new Thames Tideway Tunnel (TTT). PiP was instrumental in £370m of equity contribution to the project by UK pension schemes.
5. Since its establishment, PiP has helped secure over £1bn of committed investment into UK infrastructure projects.
6. PiP has recently received FCA authorisation. Future pension scheme investments into infrastructure will be delivered through a regulated investment fund, operated and managed by PiP.
7. PiP will not be commenting on the technical questions posed in the call for evidence. We are not urban planners, we are not transportation specialists nor are we electricity market academics. What we are is a specialist equity and debt financier, working on behalf of UK pension schemes to facilitate, source and manage effective investment by them into UK infrastructure projects. We do this because we believe the stable long term, inflation linked cash flows that can be generated by core UK infrastructure projects is a good match for the long term pension payment liabilities within such schemes. This makes decision making easy for PiP because there is one fundamental criteria above all else that determines whether pension schemes will invest into infrastructure; will the entry price, the risk taken on and the returns to be generated over the full project life improve the ability of pension schemes to pay their members pensions in full when they become due?

If this criteria is not met, there will be no investment since it would breach the basic fiduciary duty of the Trustees who are responsible for the financial security of the schemes they manage. No amount of political expediency, publicity or perceived "national interest" will overcome this basic requirement to safeguard the retirement provision for UK pension scheme members.

Background

8. When pension schemes assess investment into long term, illiquid assets, such as transport infrastructure, which typically will be bought and held for at least 20-30 years, a key consideration is the stability of the operating regime and therefore the robustness of the long term financial forecasts which need to be made. Political, regulatory, legal and subsidy environments are core parts of this stability assessment.
9. The perceived stability and predictability of the UK are real competitive advantages. Indeed, the reason why the UK has been so successful to date at attracting pension scheme investors into infrastructure projects is because it is viewed as having a very stable political, legal and regulatory environment. It is impossible to look forward to the potential for any future infrastructure investment projects without stating the essential precondition that the Government should NOT enact any retrospective legislation that would subsequently change legal contracts that have been freely entered into. Any such legislation would undermine the stability argument and severely damage long term investor confidence.
10. Where a system of subsidy payments forms a significant part of the operational economics of a project, it is equally important that these are predictable for the long term. This applies through the full project life from the earliest stages of investment appraisal, while funding sources are being secured and after project contracts have been signed.
11. Pension schemes have a fundamental obligation to pay accrued pension benefits to members, usually on a monthly basis. It is therefore vitally important that pension schemes have a reliable stream of income from their investment portfolios to enable them to fund their pension payments. This need for income imposes a finite limit to the proportion of every scheme's investment portfolio that can be invested into non-yielding assets, such as infrastructure projects which do not return any cash to investors during a construction period. In general, the longer the period of no income, the less attractive an asset is for pension schemes to invest in.

The recent Thames Tideway Tunnel project provides a good example of how multi-year construction projects can be structured to make them attractive to pension scheme investors. Equity investors begin receiving returns on their investment as soon as cash is drawn down to fund construction. The project delivers a yield from day one. To balance risk between investors and users, there are also contractual risk sharing mechanisms to maintain the incentive on the construction team to deliver an operational asset on time and on budget.

12. We now turn to the specific questions posed by the consultation, focusing on those where we disagree with the current proposals.

Response to specific key questions

Question 4: What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

Funding:

It is important at the outset of any project for there to be clarity over how the new asset is to be funded, both through its construction and its full period of operation.

- Will construction and operation be funded in one single package, as is standard in PPP/PFI projects, or is there separate construction funding followed by distinct operational funding?
- Will the users pay directly, for example through a tolling mechanism, or indirectly via taxes which support government or local authority project funding?
- Will there be any form of ongoing government subsidy for operation of the asset? If so, what mechanism or legal structure will govern the subsidy regime over the full life of the asset?
- Through what mechanisms will returns be generated for investors in the project? How secure and predictable are these return streams?

Financial markets and investors have consistently proven their ability to develop new and innovative forms of funding. This will continue and can be promoted by early definition of key project parameters.

Financing:

UK pension schemes are keen to invest into UK infrastructure projects that can provide long term, low risk, inflation linked cash flow returns. These investments can be into project debt or equity depending on precise risk profiles and return streams.

The 2015 Annual Survey of UK pension schemes by the Pensions and Lifetime Savings Association reveals that, on average, UK defined benefit schemes are only allocating 2.1% of assets to infrastructure. This would rise to 5% or even 10% if UK schemes matched their peers in Canada and Australia. There is a potential investment pool of over £25bn from UK pension schemes for projects structured to meet their needs.

The keys to accessing this pool of potential financing are:

- A clear pipeline of future projects to provide the confidence for pension schemes to develop the internal capabilities and mechanisms to invest in infrastructure.
- Projects structured to reduce overall risk consistent with producing real returns in the 2-5% range.
- Projects structured to minimise any initial periods of zero yield.
- Inflation linked return streams for both debt and equity financing.
- Clarity over the long term regulatory and subsidy regimes within which the asset will have to operate.

Delivery:

Although this call for evidence specifically excludes any consideration of the third runway in the Southeast of England, there are lessons that can be learnt from it for future London transport infrastructure projects:

It is imperative that all potential project participants, can be confident that the critical political decisions will be taken to enable projects to progress. Where timetables are provided they MUST be stuck to.

Major transport projects in London will inevitably affect many individuals and businesses. Some will benefit, some will be disadvantaged. In the age of social media there will also inevitably be pressure groups opposing projects and supporting them.

It will always be easy to delay a decision to allow for more research or consultation. Major projects need courageous decision making to make them happen. If the Government is serious about wanting to attract UK pension fund investment into UK infrastructure (as the Chancellor said in his autumn statement in 2012 and more recently in relation to investment by local authority pension funds) it must be prepared to take bold decisions with a focus on the long term, not short term political expediency.

The funding, financing and construction skills are all available in the UK to deliver major projects. The critical constraint on delivery is political decision making – or the lack of it!

Further Information

For further information please
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Pensions Infrastructure Platform

[contact redacted]



Port of London Authority Response

National Infrastructure Commission – call for evidence

3.1 London's transport infrastructure

The Commission is seeking evidence related to London's transport infrastructure, with particular emphasis on large-scale transport infrastructure improvements. Our response relates to the future potential of the Thames, the role it plays as both: transport infrastructure itself; and as a key transport route for construction of major new infrastructure, removing pressure on London's existing transport network.

Thames potential

Over the last nine months we have been developing, with stakeholders, a Vision for the development of the Thames over the next 20 years. The project has identified potential for increasing all types of river use, linking it to the growth of the city, particularly to the east. We are currently consulting on the emerging conclusions of this work around six goals, of which the following three relate to transport infrastructure:

- The busiest ever Port of London, handling 60 – 80 million tonnes of cargo each year (in 2014 the port handled 44.5 million tonnes)
- Double the number of people travelling by river – reaching 20 million commuter and tourist trips every year
- More goods and materials moved between wharves on the river, taking 550,000 lorry trips off the region's roads

A summary of the Thames Vision Goals and Priority Actions can be found on line, using this link: <http://pla.co.uk/assets/thamesvisionsummary.pdf>

The full Thames Vision Goals and Priority Actions consultation document can be found using this link: <http://pla.co.uk/assets/thamesvisionmain.pdf>

More information on the Thames Vision project is at: www.pla.co.uk/ThamesVision

We have included overleaf further information on: the Thames' existing contribution as a transport route; how the Thames is used to deliver major infrastructure schemes in the capital; the economic contribution that flows from employment of people working on and around the river; and river crossings.

Thames as a passenger travel route

- In 2014, there were ten million passenger trips on the Thames. The Thames Vision project has identified scope to double this.
- In the last couple of years, the river passenger transport network has grown west to Putney; in the coming years it is expected to grow to the east – with a series of new pier opportunities already identified.

Actions required for greater passenger travel:

- *Continued engagement between the PLA, the Mayor's team, the GLA, Transport for London and the Assembly around the ambitious targets to increase passenger travel.*
- *Making more efficient use of piers and riverspace, including new timetabling to manage peaks in traffic.*
- *Encouraging more use of piers at current low peak times.*
- *Long-term pier strategy, going beyond the existing River Action Plan: new piers at Thamesmead, Erith, Greenhithe, Swanscombe, Grays and Tilbury by 2025.*

The Thames and major infrastructure schemes

- The record 5.5 million of freight moved between wharves on the Thames in 2014, kept more than 250,000 loaded lorries off London's congested roads.
- Major schemes using the river as part of their logistics chains include:
 - Crossrail moved three million tonnes of excavated material away from London on the Thames, with 1,528 shipments taking 150,000 lorries off the roads.
 - Crossrail also used the Thames to move 110,000 tunnel segments for the eastern twin tunnels, from the factory where they were made in the Medway to the main tunnel drive site in Bow Creek, close to Trinity Buoy Wharf, saving an estimated 10,000 lorry movements.
 - Blackfriars Bridge station project over three years, starting in 2011, 80,000 tonnes of construction materials and site waste was moved on the Thames, including cranes, scaffolding, pre-cast concrete sections and 25-tonne steel rib sections that made up the skeleton of the bridge.
 - The Thames Tideway Tunnel project team has a legal commitment to move over 5.5 million tonnes of tunneling materials by river during their seven-year project, and is adopting a 'river first' policy, where materials can only be transported by road if it can be demonstrated it impossible to do it by river. This project will link to the Lea Tunnel scheme, which itself used the River Thames to move 1.7 million tonnes of excavated material from Beckton and Abbey Mills.
 - Northern Line extension: 600,000 tonnes of excavated waste material is being transport from Battersea by barge to Tilbury in Essex, removing over 40,000 lorry journeys by road and prevent 2,000 tonnes of carbon emissions.

Actions required for greater freight movement by river:

- *Work with Transport for London and the Greater London Authority to extend the River Concordat to promote freight movements by water*
- *Mandating the use of the Thames for major projects' transport needs, where projects are close to the river.*
- *Continued safeguarding and reactivation of wharves for port operations in London in accordance with national (NPPF) and regional (London Plan) planning policies; at least Peruvian, Orchard and Hurlingham wharves brought into operation over the next decade*
- *Establish a Thames Skills Academy by Autumn 2016, to provide a sustainable model for skills development on the Thames*

Thames' economic contribution

- Latest research into the economic impact of port and river operations shows that, in Greater London the Thames generates:
 - 10,000 full time equivalent jobs
 - £1 billion of economic value added annually
- The first ever study of the amenity value of the Thames found that:
 - At least 23 million people visit attractions by the Thames every year
 - Almost 100,000 people are employed in the tourism industry in wards adjacent to the Thames
 - These activities generate £2.4 billion gross value added a year

Links to the study findings are here: <https://www.pla.co.uk/About-Us/The-Thames-Vision/Evidence-Base>

River crossings

- We are supportive of the river crossings agenda, alongside retaining river access for ships into the Pool of London - as has been possible since Roman times. We will continue to work with Transport for London on this.

Action required around river crossings:

- *At least three further Thames crossings to the east of Tower Bridge, that allow continuation of river trade; the first by 2022*

About the PLA

The Port of London Authority (PLA) is a self-financing organisation, set-up by an Act of Parliament in 1909 to run the tidal River Thames in trust for future generations. The tidal Thames runs for 95 miles from Teddington Lock, through the capital, and out to the sea. Our 350-strong workforce oversees safe navigation, protects the marine environment and promotes the use of the river. We have no shareholders; any financial surpluses are reinvested in stewardship of the river and improving the efficiency of our operations. More information on the PLA: www.pla.co.uk

[contact redacted]

National Infrastructure Commission: Call for evidence

Francesca Medda
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London's transport infrastructure

3.1 What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

Different studies address the major long-term challenges which are strongly associated with steep increases in the London population, and thus the necessity to develop and adapt the transport system, particularly public transport. As a consequence, the priority will be to tackle environmental issues such as the reduction of air and noise pollution.

3.3 What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

It is possible to hone the capabilities of the Land Value Finance (LVF) tool. LVF is a financial policy tool already used in Crossrail 1 through which it is possible to finance transport infrastructure in an efficient, transparent, and equitable way. Due to the persistent effects of the 2008 economic crisis on public sector budgets, large-scale infrastructure investments such as London's Crossrail or the Northern Line Extension have typically suffered from substantial funding shortfalls; thus, there was the need to find innovative tools to finance London transport investment. Land Value Finance (Business Rate Supplements, Tax Increment Finance and Betterment Tax) was used to raise complementary financial resources to reduce this shortfall.

In the case of Crossrail 2, two specific strategies can be considered in order to improve the use of LVF, reduce costs and increase benefits. Strategy one considers a modification to the fiscal scheme of the Business Rate Supplement (BRS) by linking it more directly to the land value benefits generated by Crossrail 2. The second strategy is to use a discounted cash flow analysis to examine the gains which could be

achieved through the issue of a municipal bond backed by BRS additional revenues. We have tested the two strategies for the Crossrail 1 scheme by collecting BRS data and real estate values of London boroughs for 2009, 2010 and 2011. The results in the case of Crossrail 1, which can be extended in the case of Crossrail 2, indicate that the two strategies are indeed able to raise additional funds and reduce the costs of the transport scheme.

3.4 What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

Due to the importance of London infrastructure assets in the global context, we need to take into account the existence of heterogeneity among different infrastructure sectors and sub-sectors. As Oyedele observes, “infrastructure is an incorporation of many heterogeneous sectors including roads, bridges, ports, power generation, electricity, gas, utilities, and telecommunications with no two having identical attributes.” As verified in our analyses, UK infrastructure sectors and sub-sectors such as transport perform differently and show variations in annual returns and volatilities.

From this perspective, at present private capital exceed desired and possible investments in London. Investors are forgoing risk and seeking stable, secure options, preferably with non-zero returns, but they are seemingly sometimes happy with zero or negative returns (pension funds and other savers are essentially paying fees to park money). Despite efforts to develop innovative financial mechanisms and structures that satisfy all the needs of investors, still more can be done, particularly in the form of government initiatives to support transport infrastructure investments. When we consider private sector transport infrastructure investment, we notice how it has taken the brunt of the criticism meted out. Apart from the short duration of investment funds, another drawback is the amount of leverage of these funds and the high fees charged by fund managers, which when taken together reveal a misalignment of interests. The high fees and carried interest are beneficial for fund managers, as they lead to a buy-hold-flip structure, but they do not correspond, for example, to pension fund needs. Government restructuring of these instruments would certainly represent an important step towards encouraging pension fund investment in infrastructure such as transport.

One innovative possibility is for investors to invest directly in large physical assets such as infrastructures like Crossrail 2. However, when we consider this investment option, since a high level of capital is needed, the investor is exposed to various risks, of which policy and demand risks are among the most significant. These risks are significant since the stability of cash flows is only guaranteed if there is no change in both the transport provision of services and in the legal and regulatory conditions pertaining to a project. Within this context, three financial options: (1) London Transport Infrastructure Fund, (2) Urban Investment Portfolio, and (3) UK Sovereign

Wealth Fund, could be important as effective vehicles for transport investment in London. These three financial mechanisms allow for diverse investment across a range of sectors, and by so doing, they minimise exposure to risks that may be associated with policy making, to take one example.

Given the wide range of private and institutional investors present in the market, it is surprising that few analyses have thoroughly studied the different analytical strategies of investors. In consideration of our analyses dedicated to UK infrastructure, we can reach some interesting conclusions on the matter at hand.

The creation of a UK Sovereign Wealth Fund will aim to boost investments in large-scale infrastructure projects. The idea of creating the first UK Sovereign Wealth Fund to invest in homes, roads, and railway systems such as Crossrail 2 has recently gained a new and substantial wave of support among important figures in the UK fund management industry. This idea proposes the merging of a number of public sector pension schemes, in partnership with authorities, to create a large fund to invest in infrastructure, while simultaneously generating savings and creating attractive returns for pensioners. The potential of having a UK Sovereign Wealth Fund for infrastructure investments in London, particularly transport, is significant. This fund could not only address current infrastructure needs but also benefit future generations. Nevertheless, this idea is not without great challenges. Persuading pension funds to merge will not be easy. Some pension schemes have developed solid business models during the past 25 years, and will most likely be resistant to change. Despite the challenges, however, the idea still remains highly attractive.

In relation to the Urban Investment Portfolio, we can observe that investing in transport infrastructure within a portfolio is beneficial as long as it is part of investment in other assets, such as real estate. Our research findings have concluded that urban investments need to be treated as an integrated and interdependent entity, and that an Urban Investment Portfolio approach, by allowing for both risky and less risky urban investments, will achieve private sector high financial returns while also addressing the wider environmental/social and urban/transport needs. Private sector participation is likely to increase if the investment portfolio ranges across sectors and objectives, thereby reducing exposure to risk.

Additionally, we can confirm that the creation of a Transport Infrastructure Fund that invests in a specific infrastructure sub-sector, such as London transport, can certainly satisfy diversification benefits. In our analysis, transport shows a strong performance over the period between 2004-2014, with a return of 9.35% and volatility at 23.81%. It is the best-performing infrastructure asset, with a Sharpe Index of 0.334. This is not surprising, as transport is a very stable sector. Moreover, by focussing on transport, a fund manager can gain complete knowledge of the performance of the sector and still enjoy diversification benefits.

The introduction of these three mechanisms would allow sustainability in decisions to fit better into existing financial decision-making models and be compatible to cost-benefit approaches. The three mechanisms are also likely to foster private investor involvement because private investors help to curtail the risk of making poor investment decisions and investing too heavily, or too little, in London transport infrastructure.

3.5 How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

London has been and continues to be a role model of radical and innovative financial mechanisms for transport investments. For instance, the London Green Fund is an interesting structure after which the proposed London Transport Infrastructure Fund can be structured. To our knowledge, examples of Urban Investment Portfolio are not yet available, with the exception of our study for the European Investment Bank (EIB). The cities that have developed smart city strategies have made manifest the concept of integration of their urban investments; metropolitan role models include Barcelona, Freiburg, Malmo, and Chicago in the USA. All of these cases provide useful lessons but, as each city is different, the financial instruments would need to be defined and tailored for London.



RAC Response to the National Infrastructure Commission Consultation

ABOUT THE RAC

With more than eight million members, the RAC is the oldest and one of the UK's most progressive motoring organisations, providing services for both private and business motorists. As such, it is committed to making driving easier, safer, more affordable and more enjoyable for all road users.

The RAC, which employs more than 1,500 patrols, provides roadside assistance across the entire UK road network and as a result has significant insight into how the country's road networks are managed and maintained.

The RAC is separate from the RAC Foundation which is a transport policy and research organisation which explores the economic, mobility, safety and environmental issues relating to roads and their users.

The RAC website can be found at www.rac.co.uk

RESPONSE SUMMARY

The RAC welcomes the role of the NIC as a new, independent body which will look broadly at long-term infrastructure needs and provide impartial advice to ministers and Parliament.

The RAC's response to this consultation is based upon its experience and knowledge on road policy and will focus its response on sections 1 and 2.

RESPONSE

The RAC welcomes the National Infrastructure Commission's role in providing impartial advice on long term issues such as inter-connectivity and improving the transport infrastructure network.

Section 1 – Connecting Northern Cities

- 1. To what extent are weaknesses in transport connectivity holding back northern city regions (specifically in terms of jobs, enterprise creation and growth, and housing)?**

The RAC believes the poor state of local roads (both in the north of England and across the whole of the UK) can heavily impact upon all of the areas mentioned in the question. The vast majority of journeys begin and end on local roads, whether or not the on-going journey is by road, rail or by air. The state of local roads is now the biggest concern for motorists, according to the 2015 RAC Report on Motoring. Our figures show that for 10% of drivers the state of local roads is now their number one concern, while a further 20% listing it as a top four issue. Half of motorists (50%) say the condition of roads in their area has deteriorated over the course of the past year. Transport spending priorities reflect these concerns: 30% say local road maintenance is their top priority for government transport investment (higher than any other spending priority), and indeed 45% of motorists say they would pay higher motoring taxes if the revenue raised was ring-fenced for road maintenance.

The Government's own estimates suggest that in order to get local roads in England back to an acceptable standard, it would require a 1-off investment of £8.6bn. Independent forecasts for the Asphalt Industry Alliance suggests the sum required is closer to £12bn. The cost to businesses through damage to suspension and steering of fleet vehicles has been estimated to be around

£215m¹. Such estimations are likely to have a wider impact on business and enterprise growth. The RAC estimated that in 2013, the cost to motorists was £100m².

For this reason, the RAC believes that the National Infrastructure Commission should look carefully at the role that fit-for-purpose local roads can play within the wider infrastructure debate. Improving the strategic road network and connecting cities with new roads, whilst vital, will count for little if motorists and businesses continue to suffer costly repairs and disruption when using the local road network. Whilst we understand that local roads are primarily the responsibility of local authorities, we call upon the Commission to look further into how better quality local roads can support wider infrastructure projects.

2. **What cost-effective infrastructure investments in city-to-city connectivity could address these weaknesses? We are interested in all modes of transport.**

For the reasons highlighted above, the RAC believes it is vitally important that upgrading local roads forms part of the debate of addressing city-to-city connectivity. We strongly urge the Commission to look into this in both northern cities, and the wider United Kingdom.

3. **Which city-to-city corridor(s) should be the priority for early phases of investment?**

The RAC has no specific comment to make on this question.

4. **What are the key international connectivity needs likely to be in the next 20-30 years in the north of England (with a focus on ports and airports)? What is the most effective way to meet these needs, and what constraints on delivery are anticipated?**

The RAC has no specific comment to make on this question.

5. **What form of governance would most effectively deliver transformative infrastructure in the north, how should this be funded and by whom, including appropriate local contributions?**

In relation to local roads, it is right that local authorities continue to have the primary responsibility for local road maintenance. However, local authorities have far more prescriptive legal obligations in the provision of other services such as education and social services. As a consequence, local road maintenance commands a relatively low priority even though motorists rank local roads as second only to education when it comes to prioritising local authority budgets. The 2015 RAC Report on Motoring demonstrates this, ranking education investment first at 46%, with local road investment second at 18%. There is a role, therefore for central Government to establish a ring-fenced source of funding for development and maintenance of local roads in a similar way to which they will hypothecate Vehicle Excise Duty to establish a Road Fund for the development and maintenance of the Strategic Road Network.

¹ <http://www.fleetnews.co.uk/news/2013/3/4/potholes-costing-fleets-millions/46357/>

² <http://www.bbc.co.uk/news/uk-england-25736223>

We should welcome any actions by the Commission to look at how better quality local roads can play a role within the wider infrastructure framework.

Section 2 – London’s transport Infrastructure

- 1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?**

For motorists in London, local road maintenance is important. According to the 2015 RAC Report on Motoring, 30% of London motorists in the capital say their roads have deteriorated since 2014. Whilst this is only half the rate (59%) reported among drivers who live in villages or rural areas, it is never the less a significant percentage. It is unclear whether this is indicative that the condition of local roads in London is better than in more rural areas, or whether it is a reflection that Londoners generally have better access to other forms of public transport and so are less dependent on local roads.

- 2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?**

The RAC continues to believe that the road infrastructure will continue to play a major role in personal and public transport and in the delivery of goods and services. It is therefore essential that London’s local roads infrastructure is maintained to high standards and evolves to support ultra-low carbon road transport.

The Commission may wish to consider whether future revenue streams, such as that from the London Ultra Low Emission Zone, should be ring-fenced to further develop the infrastructure for ultra-low carbon vehicles, such as charging points for electric and plug-in hybrid vehicles and in the longer term, a hydrogen distribute network to support the refuelling of Hydrogen Fuel-cell vehicles.

- 3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?**

The RAC is not in a position to answer this question.

- 4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?**

The RAC is not in a position to answer this question.

- 5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?**

The RAC is not in a position to comment on major metropolitan areas in other countries.



[contact redacted]

Rail Delivery Group

Response to:

**National Infrastructure Commission call for
evidence:
London's transport infrastructure**

Date: 8th January 2016

Rail Delivery Group Response to National Infrastructure Commission call for evidence: London's transport infrastructure

[contact redacted]

Business representative organisation/trade body

Introduction: The Rail Delivery Group (RDG) was established in May 2011 to lead the industry in delivering a higher performing, more cost effective and sustainable rail network for Britain's rail users and taxpayers. The RDG brings together the chief executives of passenger and freight operator owning groups with Network Rail. RDG develops policies, strategies and plans for the coherent management of the rail industry and advances the provision of a safe, efficient, high quality rail service for users and taxpayers.

The RDG mission is to promote greater co-operation between train operators (passenger and freight) and Network Rail through leadership in the industry and by working together with Government, the supply chain and stakeholders. It is committed equally to the long-term health of the railway as well as the need to see improvement in the shorter term. It does this by developing strategies for the industry to put into practice and by proposing solutions for policy makers to implement.

For enquiries regarding this consultation response, please contact:

[contact redacted]

Rail Delivery Group
2nd Floor, 200 Aldersgate Street
London EC1A 4HD

What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

London's economy is continuing to grow, encouraging further population growth and demand for rail services within and beyond the capital.

The Long Term Planning Process (LTPP) has been developed to provide robust, consistent growth forecasts; and to allow the rail industry to respond flexibly to the challenge of growing demand and plan the long-term capability of the rail network. The LTPP consists of a number of studies:

- Market Studies forecast demand over a 10 and 30 year period for freight and for three passenger 'markets' – long distance, regional urban and London and southeast.
- Route Studies then develop options for all future train services, local as well as long distance, based on the demand forecasts and priorities set by the market studies.
- Network wide issues, including the requirements of freight and the potential for technological innovations, are addressed through a series of network studies (also known as Network RUS).

The London and South East Market Study included a comprehensive review of the key drivers for future rail growth, based around four scenarios determined by the trade-offs between the economy and social/environmental planning. In every scenario growth in employment in central London continues, reflecting London's unique status as a global employment market. The density of employment in central London is high, driving agglomeration and enhancing productivity.

The high density of employment in central London and the lack of capacity of the road network has created a strong market for rail travel, which is expected to grow further in line with increases in central London employment. The current mode share of rail, Underground and DLR for peak travel into London is 80%, and in recent years the number of people entering Central London by car in the peak has fallen – from 143,000 in 1996 to 64,000 in 2012. This is attributed to measures to improve bus and cycle flow (and safety) that have in effect reduced road capacity for cars, as well as to some extent the effect of the congestion charge. The need to cater for a growing commuter market amplifies the existing challenge of providing sufficient capacity for peak travel, which may remain underutilised at other times (although a growing economy should deliver increasing levels of disposable income which would encourage further off-peak travel).

The presence of employment attracts people to live in London, and the mayor's London Plan forecasts continuing high rates of population growth. However, given existing low levels of housing affordability and limited availability of land the likelihood is that many employees will be forced to live either in outer areas of the city or in the towns beyond the green belt. In both cases rail is well placed to meet this demand, as distances become too long to be undertaken feasibly by other modes and, assuming roads policy remains broadly consistent, it is unlikely that sufficient road capacity will be available for journeys to be made by car. Network Rail is particularly conscious that, in addition to strategies which support investment in rail within London, it is critical that investment supports settlements beyond the city itself, given the significant proportion of the London employment market comprised of employees who live outside the city.

It is also anticipated that the number of Londoners in older age groups will increase, strengthening the need for investment to improve the accessibility of the transport system. Although potentially of less relevance for the rail market, a number of other demographic challenges are identified in the London Plan. These include an increasing proportion of ethnic minorities and children, and the need to address continuing levels of social deprivation.

Whilst accommodating demand for peak travel (particularly into Central London and Docklands) clearly poses the greatest capacity and connectivity issue for transport infrastructure, it is also vital that connections to international gateways (particularly airports but also HS1 stations) are maintained and improved. Providing sufficient connectivity to HS2 will also be a key future requirement.

What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

It is critical to the London and southeast economy, and the wider UK economy, to continue to enhance rail services in and around the London area. The demand from passengers continues to grow, and both the infrastructure (including stations) and many specific train services are operating

beyond capacity. If further investment in both the digitisation of railway network and more conventional infrastructure and rolling stock enhancements are not progressed over the next 5 to 10 years then it is predicted that passengers will see significant overcrowding and a consistent deterioration in the reliability of performance of these railways.

Options for enhancing the network in London and the southeast are identified in the Route Studies, which form part of the LTPP. Network Rail has just completed and published, on behalf of the industry and in collaboration with DfT and TfL, four Route Studies that cover in detail investment priorities on four of the major routes into London. To complete the set of studies covering all routes into London a further five Route Studies are also underway or are yet to commence. The challenge each of the Route Studies faces is to balance the need for high-frequency commuter services with long-distance passenger and freight services connecting a diverse range of destinations.

The text below references the key conventional infrastructure-based solutions currently proposed for resolving the capacity, and in some cases service reliability, gaps. The prioritisation is down to a combination of the currently understood demand and resulting business case, but also importantly Network Rail's assessment of works that are likely to be implementable in CP6 (2019 -2024), given the current planning and consents framework. In each case where large infrastructure investment is referenced development work is already underway at Network Rail.

It is important to note that infrastructure enhancements do not offer the sole means of enhancing the capability of the network to keep pace with demand. Although peak trains tend to run with the maximum number of vehicles permitted by platform lengths on the respective routes there remains some scope for off-peak trains to be lengthened where required to accommodate passenger demand. Reconfiguration of interiors by franchisees might also enable higher numbers of passengers to be carried on individual trains.

Demand could also be more effectively managed through a combination of changes to the fares structure and improved information provision. Where they have freedom to set fares, operators have attracted increasing numbers of passengers with discounted tickets, demonstrating the potential for some demand to be attracted to times of the day where there is more spare capacity. A key factor in supporting the take-up of these cheaper fares is clear and accessible information, combined with simpler technology-enabled means of ticket purchase. Improved information on train loadings and availability of seats could further encourage a more efficient use of capacity. However, a more extensive shift of travel from peak periods would require changes to established working patterns including more widespread adoption of remote working.

Brighton Main Line and South Central suburban

The Brighton Main Line (BML) links the top three most densely trafficked parts of the UK railway network (the approaches to London Bridge, the area between East Croydon and Selhurst/Norwood Junction, and the railway through Clapham Junction), and the particularly complex way that the route is configured, with numerous branches and two major London terminals, makes this the toughest railway in the country to operate reliably. There is minimal grade separation, so the timetable requires an almost uniquely high level of flat junction crossing moves, with a routine need for trains having to be planned across busy tracks running in the opposite direction. There is also a very high level of platform utilisation at several locations and many areas where fast and stopping trains must share the same pair of tracks.

Whilst leisure based journeys and inter regional trips have grown substantially on the route in the last decade, it remains predominantly a peak commuter route, both into central London and outer London hubs such as East Croydon. Gatwick Airport is a key destination and consequently the nature of future demand on the route will be strongly influenced by the government's response to the Airports Commission. The main operator on the BML, Govia Thameslink Railway (GTR), is to provide an additional 10,000 seats on this and connecting routes by 2018. Simplified ticketing and improved passenger information will also help to ensure that this capacity can be effectively utilised.

There is already regular existing peak standing from the Gatwick Airport area into London today, with some individual services with significant standing from as far out as Haywards Heath and Hove. The BML faces substantial demand growth – by 2023 consistent standing on most peak services is forecast to extend to at least as far south as Haywards Heath; and by 2043 to Brighton, Hove and Lewes. By this date it is likely that the number of standing passengers would routinely lead to passengers being unable to board trains at key intermediate stations such as Gatwick, East Croydon and Clapham Junction, which would then, in turn, increase dwell times potentially leading to fewer trains being able to run. It is notable that this type of constraint is already manifesting itself at some

times during the high peak, particularly at Clapham Junction and East Croydon. Accommodating these levels of forecast demand can only be achieved through running more trains than the existing infrastructure can currently accommodate.

In addition to the demand challenge, and due to the operational constraints arising from the existing route configuration, it is unlikely that long term performance levels will reach those desired by stakeholders, unless capacity bottlenecks are addressed. GTR currently accounts for around 16% of national Public Performance Measure (PPM) – the largest single TOC contributor.

The South East Route: Sussex Area Route Study set out a number of key interventions which would free up capacity at major operational bottlenecks, to meet forecast CP6 and CP7 (2024-2029) demand and improve performance. For CP6 the proposals focus on the operationally critical East Croydon to Selhurst area, with new grade separated junctions to remove the need for flat crossing moves, additional platforms and concourse space at East Croydon station and additional tracks between these two elements. This would be supplemented with some much smaller scale work at a small number of other locations on the route, delivering additional peak capacity and performance improvements. In CP6 it is assumed that four additional trains per peak hour would be facilitated, split equally between Victoria and London Bridge and also equally between the Redhill route and the BML, with some services starting from Haywards Heath. However the infrastructure design is flexible so several other combinations are possible.

For CP7 and beyond a choice would arise as to whether to run further additional trains to the London Bridge or Victoria route. Running additional trains via the London Bridge route would require Norwood Junction remodelling and potentially an extension of Automatic Train Operation and ETCS Level 2 south of the Thameslink core down the Sydenham corridor. The delivery of ECTS/ ATO and Traffic Management systems on the Route would all be delivered as a joint package for a subdivided area of our Three Bridges Regional Operations Centre (ROC). Grade separation of Keymer Junction enabling more trains to start from Eastbourne, Brighton or Hove is also anticipated at this time.

The BML upgrade would provide a major catalyst for the ongoing redevelopment of central Croydon, potentially with significant oversite development above the new station. The reconfiguration of East Croydon platforms, together with the additional of new concourse space, could enable provision of large numbers of homes and office space above, consistent with demand. The London Borough of Croydon is a major stakeholder of the scheme and is a strong supporter of Network Rail's proposals.

The ongoing redevelopment of the central Croydon area means that there is potentially a limited window of opportunity to upgrade the BML in this critical area, due to the risk of development of the land outside the railway boundary which would be required. If the opportunity is not taken in CP6 it cannot presently be assumed that the option would be available in CP7.

The Croydon area upgrade proposals would, as well as enabling more trains to run fast north of Croydon, also unlock a key bottleneck on suburban slow line routes which serve a densely populated area of London not served by the London Underground network. Further work is ongoing with Transport for London to further identify which other constraints would need to be resolved to increase suburban services in CP6 and beyond.

South West Main Line

The South West Main Line (SWML) is one of the busiest and most congested routes on the network. It serves a major commuter area as well as providing long distance services from the South and South West of England to London Waterloo.

Work being delivered in Control Period 5 will see the Main Suburban and Windsor Line services extended to 10 car operation which along with the new Class 707 Desiro City rolling stock currently under construction will support the capacity needs in the suburban area. The key challenge is for main line services which use the Fast Line. The density of operation on the single Up (London bound) Fast Line inwards of Surbiton during the peak is higher than on any other single stretch of main line in the UK. The significant growth in passenger numbers alongside the constraint on network capacity means even the smallest delay can quickly be transferred to other services.

For the main line services, it is critical to note that even before growth is considered approximately 20% capacity is required to deal with existing overcrowding. Standing is commonplace from Woking and Basingstoke on main line services today, and without further, large scale, intervention beyond CP5 the SWML could see levels of crowding resulting in passengers being unable to board services from inwards of Farnborough.

The Wessex Route Study describes a strategy to meet demand to 2043. At least 37 trains per hour will need to be operated on the Main Fast Line by CP9 (2034-2039), compared with the capacity to deliver 24 trains per hour today. The key challenge on the SWML is increasing the capacity between Surbiton and Clapham. To unlock further services on this section will require a significant infrastructure intervention (or combination of):

- Crossrail 2 (delivers 32-36 peak Main Line trains per hour)
- ETCS + ATO (30-34 peak trains per hour)
- Fifth track from Surbiton inwards (30-34 peak trains per hour)

There are a number of other interventions also needed on the route to complement any combination of the above 3 options in the inner area, these are predominantly grade separation of junctions.

The scale of intervention required across the whole route is significant and therefore would need to be delivered over multiple control periods.

Several interventions have been prioritised for CP6 to provide resilience and reliability in the short term and support achieving the capacity required once combined with further interventions. The priorities for CP6 interventions are:

- Woking Grade Separation
- Woking Platform 6
- Extension of the Up Main Relief Line between Queenstown Road and London Waterloo
- Clapham Junction passenger congestion relief

Grade separation of Woking Junction will, in the short term, improve performance through the removal of the need for Portsmouth Direct Line services having to cross the opposite flow on the SWML towards Southampton. In the longer term it will enable the reliable operation of the increased level of service proposed by the implementation of the 'inner' solutions. To achieve an increased level of service at Woking will also require additional platform capacity.

A key constraint to reliably increasing the capacity on the Main Line is the section between Clapham Junction and Waterloo. To support the future train service uplift modifications will be required to the layout to support operation of an Up Main Relief Line between Nine Elms Junction and London Waterloo to support segregation of the Windsor Line and Main Line services.

Great Eastern Main Line

The Great Eastern Main Line (GEML) carries a fast-growing long distance flow from Norwich into London, key commuter flows from Southend Victoria, Chelmsford, Clacton on Sea and Braintree, as well as a significant amount of freight generated by the port of Felixstowe. Crossrail, which completes in 2019, brings significant investment to the London end of the GEML, benefiting local suburban passengers inwards of Shenfield with new rolling stock and direct connectivity to and beyond central London.

The GEML services face substantial growth between now and 2043. With services already operating at full length and no affordable solution for further lengthening due to constraints at London Liverpool Street, accommodating the forecast demand can only be achieved through running more trains.

Without intervention, services on the route to London Liverpool Street via Chelmsford will be over seated capacity and between 40 per cent and 100 per cent of standing capacity will be taken up for well over 20 minutes. Services that start from Norwich, Stowmarket, Witham and Chelmsford tend to have the highest load factors and demand is at or exceeds seated capacity now inwards of Chelmsford.

The main line inwards of Shenfield is already highly congested in the peak hour in terms of the number of services operating on the fast lines. This means that increasing the level of service above 24 trains per hour, achievable in early CP6, comes with a likely adverse effect on reliability and performance without a series of interventions to improve the capability of the infrastructure.

The Anglia Route Study set out a number of key interventions that are required over multiple control periods to accommodate the forecast demand and improve performance. For CP6 the proposals focus on delivering additional capacity on the Norwich to Shenfield corridor where current crowding and future growth is greatest. There is also a focus on improving the journey times for services on this

corridor to London and therefore the interventions provide both capacity and journey time benefits. A passing loop to the north of Witham will support an increase in peak passenger services from Norwich and Ipswich to London. The passing loop will also support journey time improvements as in the off peak it can be used to overtake slower moving freight services travelling to/from the Port of Felixstowe. Additional platform capacity at London Liverpool Street is required to support any increase in main line trains services. Trowse single line on the approach to Norwich is a critical constraint on the route which restricts the number of additional services which can service Norwich. The single line section includes a swing bridge and would need to be replaced with a two track structure to support the increase in train services required.

For later control periods, further interventions will be required to improve the signalling headway on the route to support an increase in the number of services on the section between Chelmsford and London Liverpool Street, this will require ETCS and ATO technology, part of Network Rail's Digital Railway plans for the Route. Network Rail is currently assessing whether ETCS Level 2 could be implemented earlier on the GEML in CP6 to release capacity benefits earlier. The delivery of ETCS/ ATO and Traffic Management systems on the Route would all be delivered as a joint package for a subdivided area of the Romford Regional Operations Centre (ROC).

Great Western Main Line

The Great Western Main Line (GWML) operates from London Paddington station through the Thames Valley towards the West of England and South Wales. It serves a variety of passenger markets and carries a significant amount of freight (second only to the WCML). It suffers from on-train crowding at peak times, congestion at London Paddington station, and significant constraints to operating more train services. Heathrow Airport is a key destination at the London end of the route, and if the government approves the Airports Commission's recommendation of a third runway the volume of demand it generates will increase further.

Significant investment is taking place to enhance the capacity and capability of the route. The Great Western franchise is to introduce new trains and will provide 4,000 extra morning peak seats into Paddington every day by December 2018.

On the Relief Lines, Crossrail will complete in 2019 and will provide a significantly enhanced service for passengers at stations between Reading, Heathrow Airport and London. Opportunities exist to further increase capacity through running more trains west of London Paddington, and through potentially lengthening the trains from 9 to 11 cars in the future.

On the Main Lines, the rolling stock currently used for passenger trains will be replaced with new Intercity Express trains with greater overall capacity than today. Peak frequency will also be slightly enhanced to provide 20 trains per hour arriving at London Paddington in the peak period. However, the capacity provided will only be sufficient to accommodate the demand forecast during CP5. Additional capacity will be required to accommodate forecast demand for CP6 and beyond whilst meeting crowding standards etc.

The Main Line train service required for capacity is as follows (assuming the same capacity per train as at the end of CP5):

- End CP5 20 trains per hour
- CP6 22 trains per hour
- CP7 24 trains per hour
- 2043 29 trains per hour

To run a frequency of train service above 20 trains per hour will require infrastructure changes due to the constraints of the signalling system, and the physical constraints of trains needing to cross the paths of other trains approaching or leaving London Paddington station (throat).

The Western Route Study assessed what would be required to run 24 trains per hour and developed an option to provide a grade-separated junction in the area of Ladbrooke Grove in west London. A number of configurations are possible but in essence a flyover or dive-under would take one track or pair of tracks over or under another to remove the physical constraint of trains crossing on the same level. Grade separation of Ladbrooke Grove Junction would increase the capability of the whole system, reducing the level of conflicting train movements creating greater timetable capability, increasing flexibility in the platforming and operation of services using London Paddington and associated depots. Signalling improvements would also be required to allow trains to follow each other more closely.

Linked to this is the opportunity to rationalise the layout of the throat at London Paddington station. The track in this area was installed in the early 1990s and is due for renewal during CP6. If a grade separated junction is provided at Ladbrooke Grove then it is possible to reconfigure the track layout to reduce complexity (and potential for asset failure), increase safe access for maintenance while trains are running, and change which trains use which platforms at London Paddington station, which will potentially ease crowding at pinch points within the listed train shed.

The interventions would allow 24 trains per hour to operate, and potentially more subject to further signalling technology improvements in later years.

The opportunity exists to align the enhancement of Ladbrooke Grove Junction and Paddington approaches with the renewal and the opening of the new HS2 station at Old Oak Common. Such an approach could minimise passenger impact while achieving efficient delivery of a system enhancement through alignment with the renewals.

Midland Main Line

The East Midlands Route Study examined forecast service levels on the Midland Main Line (MML) out of London St Pancras International together with local routes that radiate out of Derby, Leicester and Nottingham. The MML carries Thameslink services from the capital as far as Bedford along with Long Distance High Speed (LDHS) services to Corby, Leicester, Nottingham, Derby and Sheffield.

Enhancements planned over CP5 and CP6 will allow a new, 6 train per hour electric LDHS service to operate on the Midland Main Line. Electrification to Kettering and Corby is planned to be delivered during CP5, with the remainder of the MML to Nottingham and Sheffield via Derby being delivered during CP6. It is envisaged that new electric rolling stock to operate this service will provide the additional capacity required to meet demand for long distance journeys to London. To facilitate this, interventions will be required to lengthen platforms at certain stations along the route. These interventions will, where possible be delivered alongside electrification works; as such, Phase 1 of this work will be complete in CP5, with Phase 2 (stations north of and including Leicester) planned to be delivered during CP6. Capacity improvements enabling the sixth LDHS path are planned to be completed during CP5. Passenger growth on cross-country, regional urban local routes can be met by train lengthening where required and will not require infrastructure interventions.

While electrification also delivers stated HLOS outputs regarding energy usage and operating costs, the project will additionally provide a freight route cleared to W6, W7 and W12 gauge. Freight growth, particularly along the Felixstowe to West Midlands corridor is the other key driver for infrastructure intervention in the East Midlands in CP6. While CP5 capacity schemes between Bedford and Kettering, and between Kettering and Corby will provide for additional freight paths along the North South route, growth in these paths along with an increase in freight from Felixstowe ports will exacerbate capacity constraints in the Leicester area. A package of interventions have therefore been proposed for this area to remove conflicts between east-west (freight) and north-south (passenger and freight) flows and provides additional regulation points for freight services to provide additional pathing options and improve performance.

East Coast Main Line

For London and the southeast, the East Coast Route Study is looking at the strategic requirements for suburban services to Moorgate and Kings Cross. This part of the route also supports outer suburban services from Peterborough, Kings Lynn and Cambridge, and the growing long distance commuter market from places such as Grantham and Newark.

The new East Coast franchise will offer an additional 12,000 seats on 65 new Intercity Express trains, and it is anticipated that growth in demand will continue, supporting further investment in new rolling stock but further increasing pressure on the infrastructure. The southern part of the East Coast Main Line (ECML) is one of the first parts of the national network due to be made compatible with the ETCS (European Train Control System) during CP6. This will offer opportunities to bring digital railway solutions to bear on capacity constraints.

Demand analysis to 2023 indicates that growth on the peak inner suburban services to Moorgate will quickly outstrip current capacity, but could be accommodated through higher capacity rolling stock being procured as part of the current TSGN franchise. To accommodate that rolling stock, additional turnback facilities will be required at Stevenage. This is an enhancement that will be recommended as a priority for delivery in the next control period.

Analysis shows that significant growth continues through the period to 2043. The route study will consider the impact of accommodating additional services on the Moorgate branch infrastructure, which is known to be operating close to its design limits. Again, digital railway solutions will be key to enabling the high frequency metro-style service needed here.

The route study is also looking at how forecast growth on outer suburban routes impacts service levels: the need to balance sufficient capacity whilst minimizing the time passengers have to stand on longer journeys will focus the range of enhancement options. Given the current numbers of trains using the main line, infrastructure interventions will be required to accommodate the additional train paths identified as required by 2043.

For the services using the ECML into Kings Cross, the challenges are to accommodate long distance high speed services along with freight and outer suburban traffic carrying passengers from Peterborough, Cambridge and beyond. This mix of traffic focuses attention on pinch points such as the two-track viaduct near Welwyn. The high cost of civil-engineering solutions here will mean that options that can improve traffic management will be attractive.

The strategy to increase line capacity by finding ways to run trains closer together naturally places greater emphasis on infrastructure resilience and performance management. The future railway serving Moorgate and Kings Cross will have to run closer to maximum capacity, more of the time; that means that the infrastructure put in place will have to be specified to be more reliable. Robust industry-agreed procedures for managing perturbations to the timetable will also be important.

Chiltern Main Line

Under the Chiltern Railways franchise there has been significant investment in infrastructure and rolling stock which has led to considerable growth in demand on the Chiltern Main Line. It is likely that sufficient capacity can be provided on-train to meet demand through to the end of CP6, however there will be the need for interventions at London Marylebone to meet forecast passenger growth and facilitate passenger circulation and interchange with London Underground, for example the extension and reconfiguration of the gateline and relocation of concourse facilities.

The West Midlands & Chilterns Route Study is in development and is not due to report in draft until spring 2016. However, it is likely to identify that within and beyond CP6, further growth on the route is likely to be particularly constrained by flat junctions between Princes Risborough and London Marylebone, and two key factors at London Marylebone itself:

- The passenger capacity of the station
- The number and length of trains that can be accommodated into the station (and the difficulty of expanding a physically constrained station approach and footprint)

The Route Study is expected to also identify an option to enable some Chiltern Main Line services to divert via an enhanced Wycombe Line to an alternative London terminus at Old Oak Common. In addition to easing capacity at Marylebone, this would provide additional and improved connectivity from locations served by the Chiltern Main Line to High Speed 2 and Crossrail services. A solution is required for London Marylebone in CP7, however it is likely to be appropriate to develop and deliver the latter option in conjunction with the Old Oak Common station and in readiness for High Speed 2 Phase 1 opening in 2026.

Beyond the immediate Marylebone area, in the longer-term (for example from late CP7/the late 2020s), we would foresee a modernisation of the route to provide increased capacity and opportunities for improved journey times and performance through a package of enhancements including electrification and the implementation of ETCS as part of the Digital Railway programme.

Potential electrification of the main line highlights the need to consider options for the Metropolitan line from Amersham to Marylebone.

West Coast Main Line

The key issue for the West Coast Main Line (WCML) is the construction of HS2, with Phase 1 planned for 2026 and Phase 2 in 2033. It is anticipated that the LTPP will fully assess the implications for the WCML once the route decisions for Phase 2 are confirmed. An industry study (Capacity Plus) is currently underway to develop strategic options for train services on HS2 and WCML for HS2 Phase 1.

From a WCML perspective, the need for HS2 is based on capacity. There are three capacity challenges on the WCML:

- Capacity for future growth in commuting to London Euston, predominantly on the WCML Slow Lines.
- Demand by franchised and open access operators for additional long distance services, both to existing destinations and for through services to new destinations. The underlying driver is the need for improved connectivity.
- Capacity for freight growth, especially intermodal traffic.

Significant demand growth is expected to continue, with options to increase capacity very limited. In the short term, a programme of train lengthening will be required to meet demand but this will only be sufficient on parts of the route until the mid-2020s.

Given the mixed traffic and stopping patterns on the route, the WCML is effectively full at current levels of performance, over a number of key sections. The Network Rail report *West Coast Main Line and Trans-Pennine Capacity and Performance Assessment* concluded that with the current traffic mix and stopping patterns, there was little spare capacity for additional fast line paths. The report indicated a maximum of one fast line path may be available with a modest overall impact on PPM. Even if growth could be achieved on existing services, the full range of aspirations for additional passenger services (franchise and open access) cannot be accommodated.

Beyond the mid-2020s, a fundamental step change in capacity provision will be required. Although train lengthening schemes are required to increase capacity, the total capacity does not make the step change necessary to meet future demand predicted. That step change in capacity is provided by HS2 from 2026, releasing significant capacity on the WCML Fast Lines.

What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Crossrail 2 has the primary objective of improving public transport connectivity to key opportunity areas in London and the southeast, promoting economic growth in the region. The project will also address significant existing capacity constraints on the national rail network, particularly on the SWML from London Waterloo, and the West Anglia Main Line (WAML) from London Liverpool Street. The project is consistent with rail industry long term strategy set out in the London & South East Route Utilisation Strategy (RUS) of 2011, the recently established Wessex Route Study and the soon to be published Anglia Route Study.

The route study process includes examination of alternative options that result in changes to benefits and expected capital and/or operational costs. These are assessed by a common methodology to provide choices and recommendations. Options to increase capacity on both the WAML and SWML and are set out in the relevant route studies, and summarised in the response to the preceding question.

Crossrail 2 is a substantial project with very significant benefits to the economy. Network Rail has been working with TfL to assess alternatives, including but not limited to those indicated in the route studies.

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8th January 2016

Railfuture response to consultation questions on 'London's Transport Infrastructure'

Dear Sir,

Railfuture is a national independent voluntary organisation campaigning for a bigger, better railway in Britain, so we welcome the opportunity to provide an informed response to the questions posed by the consultation.

We recognise the importance of the provision of a responsive growing railway in contributing to wider economic, employment and skills, social inclusion and environmental issues.

If you require any more detail or clarification please do not hesitate to get in touch.

Yours faithfully

Chris Page

Chris Page
Railfuture
Vice Chairman

www.railfuture.org.uk www.railfuturescotland.org.uk www.railfuturewales.org.uk
www.railwatch.org.uk

Response to National Infrastructure Commission consultation 'London's Transport Infrastructure'

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two or three decades?

London has been an economic success based upon population and economic growth. This has in some way been sustained by London's legacy transport system but continued growth has led to a position where London is becoming a victim of its own success. Transport capacity has become a key issue with some major rail capacity schemes coming on stream in the near future, namely further London Overground, Crossrail (1 and 2) and Thameslink, together with continued investment in the Tube.

This investment will continue to sustain growth in the short term but further investments are necessary, particularly in two areas of National Rail general infrastructure: mostly radial plus addressing orbital links.

2. What are the strategic options for future investment in large scale infrastructure improvements in London –on road, rail and underground, including, but not limited to Crossrail 2?

Strategic investment, if it is to be strategic as apart from for example building more road based river crossings, needs to address the future economic and social sustainability of London.

As well as sustained investment in the Tube and improving the road network to accommodate a greater range of road users, the two areas issues of concern are outer London (and beyond) radial rail capacity and outer London orbital links (journeys currently mainly undertaken by car).

London radial rail links

Strategic investment in increased infrastructure capacity and operational resilience is needed on existing radial rail routes to accommodate the following:

- Increased capacity and frequency metro style London Overground operating within Greater London and some adjacent towns.
- Growing outer suburban services (in some cases Inter City also but alleviated by HS2) allowing for commuting and further growth in the provision of housing
- Further capacity (and journey time improvements) on key airport corridors serving Gatwick, Stansted and Luton
- Far greater operational resilience
- Better integration with orbital and Overground links away from London terminals.

London Orbital rail links

TfL's statistics show that the car is used for the predominant number of orbital trips, with bus sharing the same infrastructure not making significant inroads. Popular opinion was that rail

could not provide an effective solution here until the provision of the London Overground, now carrying a staggering 120m passengers per year.

Further strategic investment is proposed in infrastructure provision for orbital London links as follows:

- Better integration of the now existing London Overground London orbital route by provision of additional interchanges with radial routes and the bus network in particular at: Brixton, Old Oak Common (2 lines), Brockley and extension beyond New Cross (as at New Cross Gate)
- Provision of a second orbital London Overground route involving new route infrastructure further out from the centre than the existing route but well within the M25 corridor, connecting suburban centres such as Ealing, Kingston, Sutton, Croydon, Bromley, Lewisham, Woolwich (Crossrail), Barking, key North London interchanges (Underground and main line including Crossrail 2) and linking with the new centres of economic development at Old Oak Common, Stratford and Docklands
- Provision of further infill light rail routes, initially based on the Croydon/Wimbledon tram system again carefully integrated with Overground, rail and bus routes.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme

Crossrail 2 suffers from a similar issue as faced with Crossrail 1 ie lower ridership projections at the extremities than in the centre. Crossrail 1 also has a wider core from Paddington to Liverpool Street projected to the massive traffic generators of Stratford and Canary Wharf and Heathrow.

The key to increasing outer ridership on Crossrail 1 was integration with other routes. Two examples are quoted: Abbey Wood and Whitechapel. Abbey Wood in one sense is similar to interchanges from the national network but ridership is boosted by Crossrail providing for other destinations than Central London, for example Canary Wharf. Whitechapel was added later to provide interchange with the orbital London Overground line (as well as the Tube) and is now projected to be one of the busiest stations on Crossrail 1.

It is proposed that to achieve increased ridership, Crossrail 2 should include:

- Maximum integration with the orbital London Overground system, national rail, the Tube and a properly integrated bus service
- Integration with a new outer London orbital Overground system (proposed above)

It is suggested that delivery of Crossrail 2 in cost terms would be improved by:

- Reduction in the number of branches, particularly in South London (compensated by more or better interchanges)
- Provision of a client side team to oversee the project with a strong Network Rail component fully integrated into the project.

4. Funding and Financing

Railfuture is not an investment bank so comments in this area are confined to practical suggestions as seen from other projects.

It is clear that traditional Network Rail RAB style funding is not appropriate for the 'on network' or the new elements of such a programme. TfL is better equipped to undertake new construction, certainly any light rail element. However for Crossrail as a national project a special purpose vehicle and funding was proposed to deliver the project. The weakness with this arrangement is the contracted Network Rail element. In the case of Crossrail 2 this gains particular significance so a straight read across to adopt the Crossrail model is not right either.

Railfuture has responded to the Connecting Northern Cities consultation and sees provision of infrastructure projects in London as on a similar basis with a special purpose client side body including Network Rail, Highways Agency and TfL with a degree of stakeholder participation from the London boroughs. TfL and DfT/Treasury would be principal sponsors.

Ring fenced funding would be a function of the benefits and the beneficiaries of such benefits, achieved as with Crossrail from government (as currently funded by Network Rail, TfL, the farebox and benefits to businesses and housing either hypothecated or by specific local taxation). The workstream on this is sizeable on previous experience, but probably worth it.

5. Have other metropolitan areas in other countries responded to similar challenges and priorities? Are there any responses to be learned and applied to London

Other than the obvious, but relatively simple cases in land ownership and governance terms of Hong Kong and Singapore, London itself in the form of TfL is probably the best example of derivation and implementation of a strategic transport solution set against wider economic criteria. TfL has through the London Overground and Crossrail 1 developed into the area of national rail sponsorship and projects although the structures here may be somewhat different.

Paris RATP has formed a strong partnership with London and has applied a very long term strategic approach of sustained investment. More particularly RATP is well advanced in the sustainable provision of orbital services with its fast developing orbital light rail projects. Like London, Paris has had a difficult relationship with SNCF/RFF as providers of national rail infrastructure.

New York, for years a traditional system like London has also embarked upon a series of major transport infrastructure projects designed to increase capacity and resilience of the system. The strengths of this example are in the area of coping with complex stakeholder and governance systems, hampered by geography in that a key part of the catchment area of the city is in a different state -New Jersey. This has in the recent past led to some very ill conceived transport projects, but New York has delivered generally in a very much more complex stakeholder scenario than London. New York had also set up a major projects division to deliver large infrastructure projects.

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8th January 2016

National Infrastructure Commission (NIC): Call for Written Evidence

Introduction

RICS – Royal Institution of Chartered Surveyors - is pleased to respond to the above consultation. Intelligent infrastructure planning is vital to the social and economic health of the country, and the creation of the NIC to identify the UK's infrastructure priorities is hugely welcome. The Commission now needs to fulfill its potential, and our response sets out some of our ideas on how this can be achieved.

RICS is the leading organization of its kind in the world for professionals in property, construction, land and related environmental issues. As an independent and chartered organization, RICS regulates and maintains the professional standards of over 100,000 qualified members (FRICS, MRICS and AssocRICS) and over 50,000 trainee and student members.

It regulates and promotes the work of these property professionals throughout 146 countries and is governed by a Royal Charter approved by Parliament, and monitored by the Privy Council, which requires it to act in the wider public interest.

Since 1868, RICS has been committed to setting and upholding the highest standards of excellence and integrity – providing impartial, authoritative advice on key issues affecting businesses and society. RICS is a regulator of both its individual members and firms enabling it to maintain the highest standards and providing the basis for unparalleled client confidence in the sector.

RICS and Infrastructure

Our members are integral to providing the necessary project management and cost savings through the whole life of infrastructure projects. They use professional standards and relevant guidance, as well as benchmark data, to deliver projects on time and on budget. This ensures that infrastructure projects are considered, planned for, financed and executed appropriately, crucial to ensuring business and investor confidence. In addition, we can provide expertise on spatial planning and locational investment to equip the Commission to make effective strategic choices on the UK's infrastructure priorities.

We were at the forefront of calling for a National Infrastructure Commission to develop a long-term strategic approach to the UK's infrastructure needs, and the establishment of the Commission last year was a highly intelligent step towards achieving this. We are continually

developing our activities in the infrastructure sphere and will work closely with the Commission to meet the UK's infrastructure needs.

We are unique amongst the professional institutions for the built environment in the breadth and depth of our understanding across land, property and construction. We also have strong working relationships with other organisations across the sector, and are uniquely placed to engage with the Commission to develop a holistic strategic approach.

It is in this spirit that we have launched the [Infrastructure Forum Steering Group](#), which is designed to give a voice to the best practice commercial delivery on UK infrastructure projects, and to lead a significant forum of professionals who seek to maintain and enhance value outcomes for lower levels of expenditure. The membership of this group includes leading figures from across the built environment, not just RICS members, and can be an invaluable source of advice, expertise and input for the work of the Commission.

Our President-Elect Amanda Clack plays a leading role in the infrastructure sector as Head of Infrastructure at EY. Her previous experience of working across land, property and construction for PwC gives her a unique insight into the issues involved, and she has written extensively on the challenges that need to be overcome if we are to deliver the UK's infrastructure requirements. Amanda has steered our infrastructure work and will continue to do so when she becomes President later this year. Her appointment as President will be another opportunity for RICS to support the work of the NIC and we look forward to continuing our collaboration.

This submission addresses a selection of the questions raised in the call for evidence. We have engaged widely across the sector in formulating the response, which is based on a large number of research papers, thought leadership pieces and other documents which can be provided to the Commission upon request.

Connecting Northern Cities

1. To what extent are weaknesses in transport connectivity holding back northern city regions (specifically in terms of jobs, enterprise creation and growth, and housing)?

Our members strongly perceive the lack of sufficient connectivity between northern city regions to be a severe constraint on economic growth and a threat to the realisation of the Northern Powerhouse. The 2014 Report produced to support the Higgins Review of HS2 – *Transport Constraints and Opportunities in the North of England* – identified many of the costs associated with the relative weakness of connectivity infrastructure in northern regions – specifically between the large city regions. For example, commuting between Manchester and Leeds is found to be 40% lower than would be expected given the size, location and socio-economic profiles of the two city regions¹. This is largely due to prohibitive transport costs associated with such commutes, in the form of longer journey times and ticket prices. This has a real knock-on effect in terms of labour mobility, the flexibility of the housing market and business creation.

¹ Steer Davies Gleave, *Transport Constraints and Opportunities in the North of England*, 2014

The problem of connecting northern cities is particularly significant because, in common with all areas of the UK, the economic health of the region as a whole is dependent on economic growth within its largest cities. Urban areas benefit from the advantages associated with the concentration of jobs and enterprises within a specific area. Productivity is higher in urban centres, with output per worker 15% more than in rural areas. The five largest Northern cities of Manchester, Liverpool, Leeds, Sheffield and Newcastle account for 60% of the region's Gross Value Added (GVA), and for this strength to be leveraged for the benefit of the whole region, the transport infrastructure connecting them needs to be radically improved.

Infrastructure spending per head in the North is vastly lower than in London. For example, whilst the figure for London is £5,426 per head, the North West receives £1,248, Yorkshire and the Humber £581 and the North East a mere £233². Whilst it is understandable that investment in the capital is very high, the disparity needs to be addressed if the government is to achieve its stated objective of rebalancing the UK economy and unleashing the potential of the Northern Powerhouse.

2. What cost-effective infrastructure investments in city-to-city connectivity could address these weaknesses?

The announcement in the Autumn Statement that HS2 will extend from Birmingham to Crewe 6 years earlier than initially planned was very welcome given the need for certainty and clarity over investment plans. Our members were also pleased to see the funding for Transport for the North (TfN) confirmed at £50 million as part of an overall transport budget of £13 billion.

The simple fact is that the Northern Powerhouse does not at present have any real meaning as a coherent entity due to the excessive travel times between its various regions. For example, a rail journey from Newcastle to Manchester takes 2-3 hours, whilst a journey from Liverpool to Hull takes 3 hours. This is in stark contrast with the south, where journeys of similar distances typically last less than 2 hours. To address these issues, the Manchester-Leeds transport corridor needs to be improved, and cities currently outside of major planned developments such as HS2 need to be better integrated into the system as a whole. Road transport should be similarly improved, as the motorway network currently suffers from many of the same shortcomings as the rail system.

It should also be recognised that there are significant gains to be made from improvements to the existing infrastructure – connectivity improvements between northern hub cities will not always necessitate entirely new projects. Too often infrastructure is seen as being synonymous with brand new schemes, and the benefits of maintaining and improving existing transport links should not be underestimated.

3. Which city-to-city corridor(s) should be the priority for early phases of investment?

² IPPR North, *Transformational Infrastructure for the North*, 2014

As is referred to above, the economic health of the North as a whole depends on stronger transport links between all of its core cities. Until connectivity between cities such as Newcastle, Liverpool and Hull is improved to create a single, coherent economic unit, there is no incentive for policymakers in any of these regions to agree to investment in improvements in other areas when their electorate or employees cannot benefit because travel times and fares put jobs there out of reach.

The concept of a HS3 corridor between Manchester and Leeds would be a good starting point, but it is vital that the concerns of other cities are also addressed. In particular, there is a perception in the North-East that cities such as Newcastle, Sunderland and Middlesbrough could be left out of the equation as the Northern Powerhouse agenda proceeds. These cities must be given careful consideration as the network as a whole is developed.

4. What are the key international connectivity needs likely to be in the next 20-30 years in the north of England (with a focus on ports and airports)? What is the most effective way to meet these needs, and what constraints on delivery are anticipated?

In terms of the North East of England, the joint report 'Faraway so close: the North East as an international gateway' from IPPR and NECC puts forward a well-argued case for the development of North East ports and airports to create a better international gateway on the eastern side of the country (<http://www.ippr.org/publications/faraway-so-close-the-north-east-as-an-international-gateway>). This would underpin the development of manufacturing in the region, which remains the only English region with a consistent positive balance of trade.

5. What form of governance would most effectively deliver transformative infrastructure in the north, how should this be funded and by whom, including appropriate local contributions?

A major threat to the delivery of a coherent and integrated transport system for the North is the fragmentation of governance structures. As has already been stated, the Northern Powerhouse is not (and arguably can never be) a monolithic entity. The region comprises numerous different cities and areas with different agendas and priorities; the creation of a successful infrastructure network serving the whole of the north requires that these disparate areas cooperate and coordinate with one another.

The establishment of TfN was a welcome step in terms of the strategic oversight it can provide for transport infrastructure in the north. It is vital that this body works closely with industry leaders and elected Mayors in ascertaining the needs of the region, and the RICS is willing to provide support and advice. At present TfN is very much public-sector dominated and it must work in close partnership with the private sector if it is to be effective.

The devolution announcements made by the Chancellor last year were a bold statement of intent with regards to shifting power from Whitehall to local authorities, and could be the start of a process that allows all regions of the UK to fulfil their potential. In practice, the delivery of City Deals now needs to ensure that fragmentation is avoided. For example, whilst directly elected

Mayors can provide effective local leadership in delivering infrastructure developments, they could also result in competing demands and conflicts of interest which hinder developments of regional and national strategic importance. Mayors will need to recognise the value of collaboration, and the NIC should make a compelling case for cooperation between cities when publishing its National Infrastructure Assessments.

The granting of powers over business rates to elected Mayors, giving them the power to increase the rate by 2% to fund major infrastructure projects (in agreement with local businesses) is a welcome incentive for Mayors to take ownership of development in their regions. By decoupling infrastructure spending from the vagaries of direct government grants, this should help northern cities take a more flexible and strategic view of long-term infrastructure requirements, and again this is an area where the recommendations of the NIC can add significant value. However, more clarity is needed on whether the increased funding from business rates retention and the power to increase rates will be sufficient to meet any shortfall from the reduction of direct grants. The final funding settlement needs to ensure infrastructure spending is protected.

London's Transport Infrastructure

1. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

The Government's Construction 2025 strategy set ambitious targets to reduce costs by 33% and delivery times by 50%. For these ambitions to be met on large-scale strategic infrastructure projects like Crossrail 2, delivery needs to be significantly improved – around 75% of capital projects are still reported as going over budget. The surveying professionals represented by the RICS, particularly commercial managers and quantity surveyors, are indispensable to the achievement of cost savings on the scale required.

A key element of the Construction 2025 strategy is the creation of an infrastructure sector "underpinned by strong, integrated supply chains and productive long term relationships". To explore how this vision can be realised, RICS are currently working on a number of high-level Insight Papers to be published over the next year, across Building Information Modelling and Engineering, SME Engagement, Skills & Training, Team Building, Procurement, and Whole Life Cycle Costing of Rail Assets. The findings of these papers will apply to all rail projects, and will be especially applicable to the delivery of Crossrail 2.

The working hypothesis underpinning these Insight Papers recognises that the rail infrastructure industry is naturally fragmented but that better alignment could be secured through reaching a better understanding of enablers and measures (e.g. technology, policies, and training) and by focusing on ways of removing such barriers.

In addition, some of our members have expressed the desire to see stronger links between Crossrail 2 and Gatwick Airport as a way of improving access from across the capital and by extension, across the South-East more broadly.

2. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

The past decade has seen some major strategic successes in the delivery of large-scale infrastructure projects in the capital, most notably on the 2012 Olympics and Crossrail. These achievements were made possible because they were based on a political consensus, a bold strategic vision, and they made effective use of innovative public-private delivery partnerships. Future infrastructure projects need to recognise what went right in these cases and where possible, replicate their experience.

The successful delivery of infrastructure requires both public strategic oversight and private delivery and funding mechanisms. The benefits of infrastructure for private investors are primarily the scale, longevity and certainty of long-term returns, and the NIC should assess how the full potential of private investment in the sector can be unlocked. We have already written to Commercial Secretary to the Treasury Lord O'Neill offering to convene a review of the barriers to infrastructure investment through collaboration across the built environment professions. Infrastructure cannot be entirely reliant on international investment and pension funds, and we are willing to work with the Commission to explore in-depth how funding can be obtained from other sources.

Electricity Interconnection and Storage

1. What changes may need to be made to the electricity market to ensure that supply and demand are balanced, whilst minimising cost to consumers, over the long-term?

The most effective way to minimise cost to the consumer is to ensure that as new forms of energy come forward, they are delivered in a technology neutral manner deploying the lowest cost generation mix. A mix of intermittent and base load needs to be delivered with the true cost of carbon being accounted for, coupled with the likelihood that currently all forms of new generation need some form of market support mechanism.

In the short term given the lack of new generation and investment coming forward, there needs to be certainty for investors in new generation, something that the ongoing changes to renewables and CCS funding have severely affected.

Balancing supply and demand will require the mix of generation types, whilst the meeting of climate change targets will require continued deployment of renewables alongside other new low carbon base load. In the short term the premature closure of existing thermal coal plants will adversely affect supply/demand and balancing if these plants are taken off line before there is a

clear pathway to delivering fossil fuel plants with carbon capture and storage. If an SO can assist in achieving these objectives then it will be of benefit.

2. What are the barriers to the deployment of energy storage capacity?

The energy storage sector within the UK is immature and requires policy, regulatory and market support mechanisms to ensure that the long-term investment required can be delivered.

There is a need for storage technology at all of levels. For those that would work within the transmission network and distribution network scales, the investment will be significant and therefore needs clear government focus and support to ensure that new storage investment and technologies are able to come forward and work effectively within the current UK market mechanism.

3. What level of electricity interconnection is likely to be in the best interests of consumers?

Interconnection plays an important part of the UK supplier/demand arrangements, but there appears to be an increasing over-reliance upon interconnection with mainland Europe rather than bringing new generation capacity on stream within the UK. There are a number of implications of this, including over reliance on non-UK generation at the time of tight capacity margins. They do nothing to stimulate investments into new UK-based low carbon generation, whilst adding to carbon leakage as emissions have the potential to become 'offshored'. For example, fossil fuel plant within the UK has to bear the significant extra cost of the UK's unilateral carbon floor price, whilst fossil fuel generation in Europe does not bear the same level of carbon taxation, and is able to export into the UK via interconnectors.

Yours faithfully

[contact redacted]

Royal Borough of Greenwich

Response to the National Infrastructure Commission call for evidence

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

The challenges facing London over the next two to three decades are well documented and are wholly related to population growth. It is recognised that the greater part of this growth is going to take place in East and South-East London. The challenge is to provide the necessary housing mix and social and transport infrastructure to support and facilitate that growth in a timely way.

In recent polling commissioned by London Councils, Londoners named housing, health and schools as their top three infrastructure priorities, as well as strong support for investment in the 'unseen' infrastructure that is vital to the city's functioning – waste, energy, digital and flood defences.

London Councils' polling indicates that 88% of Londoners believe there is a housing crisis. The challenge is to increase the supply of new housing, and particularly affordable housing, at the same time as increasing (primarily public) transport infrastructure and services so that existing and new populations have good access to employment opportunities and other facilities.

The additional challenge in south and south east London relates to convergence. It is clear that, overall, residents have lagged behind the London average in terms of educational attainment, wealth, health and life chances. The challenge is to ensure that growth takes place in a way that supports convergence.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

- How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?
- What might their potential impact be on employment, productivity and housing supply in London and the southeast?

The Royal Borough believes that there a number of strategic transport infrastructure schemes and initiatives that London needs..

We believe that transport schemes that will unlock housing numbers and growth in jobs and businesses and facilitate convergence should be prioritised. Transport schemes are not ends in themselves, but are a vital part of the wider infrastructure the city needs to provide for its residents and businesses.

The Commission will recognise that schemes such as the Jubilee line and Docklands Light Rail extensions and have unlocked areas of London for growth and regeneration and that Crossrail is already having a positive impact. However it is clear that further investment infrastructure is needed.

East River Crossings

The completion of a package of additional vehicular and public transport River Crossings, in east and South-East London needs to be prioritised in order to support growth and development in East London.

A package of crossings, constructed from west to east to match the direction of growth, would link new areas of population growth, such as Kidbrooke, with areas of employment opportunity and would support the sustainable development of areas such as Thamesmead where poor accessibility has hampered growth.

The proposed Silvertown tunnel will support growth and employment and improve resilience but needs to incorporate a DLR extension between the residential areas of Eltham and Kidbrooke and emerging employment opportunities north of the river if benefits are to be maximised.

Additional river crossings, including schemes such as the Gallions Reach crossing and extensions of the DLR and London Overground to Abbey Wood and Thamesmead, would provide access to London's wider transport network and support growth and development those areas at a fraction of the cost of schemes such as Crossrail 2 and add further benefit to those that will be secured through Crossrail1.

Additional local vehicular crossings are needed to support business growth but must be built with integrated public transport and be supported by walking and cycling routes so as to ensure that the use of more sustainable transport modes is encouraged in order that air quality is improved and local amenity sustained.

Change of responsibility for Rail

A change in the governance arrangements around Rail in London needs to be a strategy priority. The responsibility for managing rail services in London needs to be delegated to the Mayor for London at the earliest opportunity. The current franchise system simply does not support the growth and development of London and has not provided the services that Londoners deserve.

The transformation of the North London Line when it became part of the London Overground service shows what can be done with Mayoral control, focus and investment. The London Overground handled over 143m journeys last year, an increase of 7% over the previous year - demonstrating that Londoners need excellent "turn up and go" rail services.

A rail service managed by the Mayor would see joined-up London rail network with more frequent services and increased capacity, improve customer service with joined up travel information, more integrated fares and a more accessible network. It would enable local communities to have a greater local input into train services.

All this would support the economic and social vitality of London, particularly areas such as South- East London that are not part of the London Underground network .

However, a change in governance will not on its own result in a step change in rail performance, services and facilities. Further investment is required and needs to be prioritised in areas where existing operators have underperformed and have failed to invest. The London Overground is evidence that focussed investment in local rail services increases ridership and supports the more intensive growth and development that London needs.

Improve orbital routes in outer London

At present London rail and road infrastructure is too focused on getting people into central London and out again. The London Overground and the DLR extensions from Lewisham and Woolwich have, to an extent, supported growth in East London. Crossrail and the Silvertown Tunnel will provide further support.

However in the outer London boroughs a reasonable proportion of residents commute orbitally to work in another town centre or outer borough. Town centres in outer London such as Woolwich, Eltham, Kingston, Sutton, Croydon and Bromley would benefit from improved public transport and light rail links between these areas.

Investment in efficient orbital public transport needs to be prioritised to support the growth and vitality of outer London town centres and to free up capacity on radial services which are too often used by passengers seeking to make orbital journeys.

The success of the Croydon tram-links is evidence that investment in light rail can support orbital movements between outer London town centres, encouraging growth and development and reducing car dependency.

Crossrail

It is clear that the opening of Crossrail will represent a step-change in London's transport arrangements particular in the northern part of the Royal Borough where access to emerging employment areas has been constrained.

However priority needs to be given to opportunities to extend Crossrail so as to improve access to emerging growth areas. In the south-east priority needs to be given to an evaluation of the benefits of extending Crossrail to Ebbsfleet.

Crossrail 2

Crossrail 2 is needed to address severe capacity constraints that will exist on the London Underground and mainline Network Rail services such as those into London

Waterloo. When High Speed 1 is complete, Crossrail 2 is needed to provide capacity to allow those passengers to transit easily through London Euston. Crossrail 2 will support significant numbers of jobs and housing along the line and provides general regional connectivity, which at present is only offered by the Thameslink line. Crossrail will improve this but more rail lines which negate the need to use the tube will have wide benefits for the rail and tube network in London as a whole.

An improved bus network

Whereas investment in major transport infra-structure projects such as Crossrail is critical for the economic prosperity of London and the UK priority needs to be given to enhancing and improving the bus network.

Bus infrastructure and services can be more responsive to local needs and developments and should be prioritised for continued investment. There are countless examples in the Royal Borough where new bus services have proved to be oversubscribed shortly after opening and have needed to be enhanced.

Investment needs to be prioritised in a mechanism, particularly in outer London, which is more responsive to changing local circumstances.

Cycling and walking

Although the Commission is focussed on large – scale infrastructure projects there is evidence that investment in cycling and walking is also essential to support the growth and economic vitality of London in a sustainable way. Any major infrastructure scheme must be fully integrated into the local bus, walking and cycling network. Moreover, away from the major transport hubs, continued investment in walking and cycling networks is required to reduce car dependence, improve air quality and encourage healthy lifestyles.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Crossrail 2 would assuredly support the necessary growth and development of London and produce a step-change in transport capacity it would not directly impact on the Royal Borough of Greenwich.

Accordingly the Royal Borough has insufficient understanding of the Crossrail 2 business case to respond to this question and would refer the Commission to the response submitted by London Councils.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

- What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?

- What innovative funding mechanisms could be considered to support delivery of key schemes?

The funding mechanism for Crossrail is unique and has ensured delivery of a scheme that might otherwise not have happened. It should not however be considered the default solution for Crossrail 2 or other similar infrastructure schemes.

The Royal Borough would expect the Commission to make recommendations to Government that (i) recognises that every transport infrastructure scheme will have a different distribution of benefits and (ii) based on an analysis of funding mechanisms utilised elsewhere in Europe and beyond.

Submission of the Royal Borough of Greenwich

7th January 2016

[contact redacted]



THE ROYAL BOROUGH OF KENSINGTON AND CHELSEA
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Councillor Timothy Coleridge
Cabinet Member for Planning Policy, Transport and Arts
e-mail: Cllr.Coleridge@rbkc.gov.uk

Mr Andrew Adonis
Interim Chairman
National Infrastructure Commission
1 Horse Guards Road
London
SW1A 2HQ

8 January 2016

Dear Mr Adonis,

National Infrastructure Commission Call for Evidence - Large Scale Transport infrastructure projects in London

Response from Royal Borough of Kensington and Chelsea

The Royal Borough has confined its comments to London's transport infrastructure and thought it would be helpful to set out the response in the light of our experiences with Crossrail 1 and 2. We have framed the response in terms of the impact on this borough as we believe this will be of most use to the Commissioners.

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

The main challenge facing London is accommodating a population predicted to increase to 10 million by 2030 within a limited metropolitan area, which has already resulted in hugely inflated housing prices.

This house price inflation is increasing geographical inequality forcing people to live in the less accessible, and therefore cheaper, parts of outer London making investment in transport infrastructure even more critical for the capital's future success. In the Royal Borough this is particularly marked as middle income groups can no longer afford to live here and the vast majority of the people who work in this borough have to commute in.

For population increase to be sustained there needs to be growth not only in residential units but in jobs and wealth as a whole. We would urge the Commission

not to take too narrow a view of how this might be achieved. It is not only in terms of additional homes. We have calculated that with the Crossrail 2 proposed station in the King's Road in Chelsea an additional 3,500 residential units with a GDV uplift of more than £7billion could come forward in the 40 year timeframe that has been allowed.

Account should be taken of the agglomeration effects of central London – namely the productive benefits that come when people and organisations from different sectors work closely with each other are realised to maximum effect. Without good communication and excellent public transport facilities in the next 20-30 years, this will simply not be achieved. As part of this submission we include an economic and productivity paper at Appendix A which demonstrates the social and economic benefits which would be achieved, or to put it more simply, what would be lost without a station in Chelsea.

For London to continue to compete as a World City the Mayor of London has made it abundantly clear in London Plan policy that the capital must maintain its reputation in a variety of world markets. Global competition will increase in the next 20 – 30 years. Success against this competition can only be achieved with a public transport system that has excellent coverage, ample capacity and that is fit for purpose. We believe that this is where a Crossrail 2 station at Chelsea can provide what no other station can. Chelsea has a world class medical hub which will need excellent accessibility to be able to evolve and remain dominant in the field of heart, lung and cancer research and treatment. The King's Road is a unique shopping and leisure destination. Chelsea also provides a home to some of the country's most influential people operating over a wide variety of disciplines that contribute to UK plc.

Chelsea is home to some of the people that help to power London as a world-class centre of economic activity and finance; these people help the capital to compete with other global cities like New York, Frankfurt and Paris. People who live in Chelsea most commonly work in the West End, the City and Canary Wharf, as Appendix A shows, so being able to use Crossrail 2 would considerably reduce their journey times, improving their quality of life and their potential productivity. However, it is essential both economically and socially, that a Crossrail 2 station is also provided for those households on lower incomes living in areas of higher deprivation such as Cremorne or the Sutton Estate.

Apart from significant benefits to the Chelsea medical Quarter Crossrail 2 would contribute to wider employment opportunities in the borough. Many of our schools, shops and offices are struggling to retain staff and this social trend is set to continue and intensify in the next 20-30 years unless there are excellent transport linkages in place.

Air quality is another significant challenge. Poor air quality is a factor in 1 in 12 deaths in the Royal Borough. With growing awareness of the health impacts of poor air quality, this could become a significant deterrent to living or working in central

London. Appropriate public transport facilities with CR2 being exploited to the full will help to avoid such a scenario.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

- How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?
- What might their potential impact be on employment, productivity and housing supply in London and the southeast?

Future investment in large-scale transport infrastructure must not be driven solely by project delivery requirements. It is vital that the full regeneration benefits of infrastructure investment are identified at the project's inception, and additional benefits are actively sought out throughout the project to ensure the maximum possible benefits are extracted from public investment.

In the case of this Borough we have presented evidence to DCLG (via the Community Budgets Project, see Appendix B) demonstrating that we have found it difficult to make our case heard for a fully funded Crossrail 1 station for Kensal Gasworks Opportunity Area, that would unlock development of a major brownfield site, because the scheme's joint transport sponsors TfL and DfT are only charged with delivering their defined project on time and on budget. Clearly, investment opportunities cannot be appraised properly if the regeneration aspect is not given appropriate weight or prominence.

Last summer we had to make a similar case to the HS2 Select Committee because that scheme was proposing to relocate a depot onto land that is needed to improve access to the Kensal gasworks site. Without this additional access route the capacity of the one remaining major brownfield site in this borough will be limited to about 700 homes. With the second emergency access it could accommodate over 4,000 homes.

Currently we are making the case that quite modest additional investment in track would increase the reliability of services on Crossrail 1 and enable delivery of a Crossrail station at Kensal Portobello that would unlock this site and deliver: over 4,000 homes; £2bn Gross Value Added and £2bn Gross Development Value. TfL and Network Rail are now actively considering this proposal but it has taken over seven years to get to this point.

We also think there may be merit in considering the varying productivity of individuals living in different areas when assessing investment decisions. The work we have undertaken for the Crossrail 2 Growth Commission has shown that the average salary of people living is at least Chelsea twice the London average. So the

value of their journey time savings should be calculated on this basis rather than the London-wide figure.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Some might be tempted to view the £27 billion project cost as a starting figure, to be pared back by the selective removal of some stations or sections of line. Indeed there is a group in Chelsea campaigning for removal of the King's Road station, and reduced cost is one of their justifications.

It is true that TfL could save around £1bn from capital costs without this station but this would be a short sighted and false economy. Initial calculations suggest that stamp duty alone from increased residential prices in the vicinity of the station and additional development that is likely to come forward (£720 million calculated over 40 years) would cover 70% of the cost. The overall redevelopment that might come forward, at a scale appropriate for the borough, could yield £6billion in additional Gross Development Value. This is before consideration of the Gross Value Added that this development would deliver.

As referred to in response to question one above, it is important to consider the type of people who live in Chelsea and would benefit from a station in King's Road. Average salaries here are 50% higher than London as a whole which means that the journey time savings would be in the region of £400 million (over 60 years), compared with £275 million based on London average earnings.

This is without considering other benefits which are more difficult to quantify like: shorter journey times improving staff retention; enhance employment prospects; increase in business rates; maintaining London's position as a global city; additional tax payments from households that might otherwise not chose to locate in London and; even more difficult to quantify, the health benefits resulting from improving air quality. It may be worth commissioning research to calculate these benefits for the whole line.

Crossrail 2 has already taken the decision to invest in the wider benefits that a regional, rather than a metro style route, can deliver. It would not make sense now to cut out a station that would serve a major retail and cultural centre, and the Chelsea Medical campus, which provides world-leading treatment for cancer, heart and lung disease, as well of one of London's premier residential districts.

We are working with the Crossrail 2 Growth Commission to quantify the benefits a station in Chelsea would deliver.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

- What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?
- What innovative funding mechanisms could be considered to support delivery of key schemes?

The funding currently identified for Crossrail 2 will come from fares, Mayoral CIL, Business Rate Supplement, Council Tax precept and over station development.

Knight Frank have identified that prime London Central London prices have increased by 13% over the market average within a 10 min (roughly 800m) walk of a Crossrail 2 station. Work undertaken by this Borough for the Crossrail 2 Growth Commission has shown that if there was a similar 13% increase in value additional Stamp Duty on properties around the proposed station at King's Road this would produce £7.5m p.a. in Stamp Duty or £300m over 40 years (£163m cumulative present value). So local retention of Stamp Duty, or at least retention of the increase in Stamp Duty, could be a useful funding stream.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

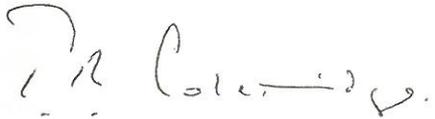
Whilst we do not have experience of how metropolitan areas in other countries have responded to challenges and priorities which are similar to London, we would urge strongly that the silo structure for delivering large infrastructure projects is broken down and such projects are delivered in a more creative and holistic manner. As outlined in our response to question 2 it has taken us seven years of tenacious hard work and lobbying to start to see real movement in getting a Crossrail 1 station at Kensal. This, despite the fact that we had, in principle support from the Mayor of London and the station appeared in our adopted Local Plan at the end of 2010.

We have also agreed to fund the cost of the station and it is key to optimising development of up to 4,000 residential units on the Kensal Canalside Opportunity Area. Despite housing delivery on Opportunity Area sites being possibly the prime consideration of the London Plan we have sadly experienced significant barriers for getting traction for the scheme. I am pleased to say that we are now making headway with the able assistance of Isabel Dedring, Deputy Mayor for Transport, but it has certainly been much harder work and more difficult than we feel it should have been.

Having so many different bodies and organisations involved in infrastructure delivery, all of which have different priorities and timescales has not assisted and there needs to be much clearer direction and thought given to such projects so that a key figure can act as a clear point of contact and has sufficient authority to push projects of importance through without them becoming bogged down in technical

detail which can nearly always be overcome. I suspect that the approach in many other countries is more coordinated. At least we have the benefit of a strategic authority in London. I would hate to think how any headway could be made outside London, given the current arrangements. I hope these comments will be of use.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Tim Coleridge'.

Councillor Tim Coleridge
Cabinet Member for Planning Policy, Transport and Arts

1. Background

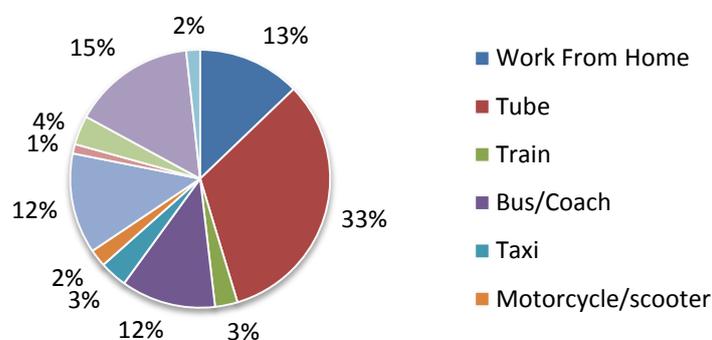
1.1 We have taken a 960m (12 minute) walk from the point of the station and considered a good distance for considering the socio-economic profile of Chelsea.

2. Travel

2.1 As is seen below, around a third of Chelsea residents use the tube to get to work. This is slightly higher than the Inner London average of 30 per cent. Whilst part of the impact will account for those living in the immediate vicinity of Sloane Square station, this still indicates that there is a strong demand for our residents to use mass transit systems to commute.

2.2 Over 2000 (12 per cent) use the bus. This number could be cut significantly should a Crossrail2 station come forward on the Kings Road, Potentially; the number of people travelling by car could also come down. Including taxis, car usage equated to 15% of residents.

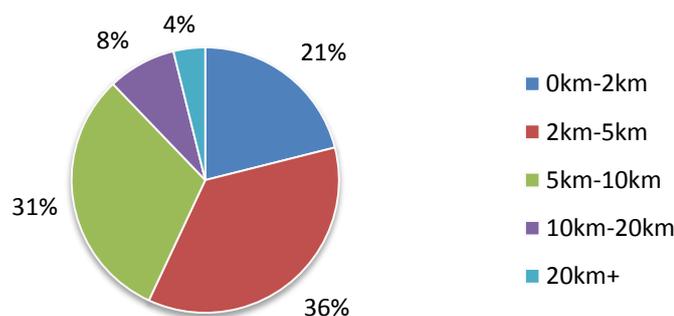
Mode of travel to work



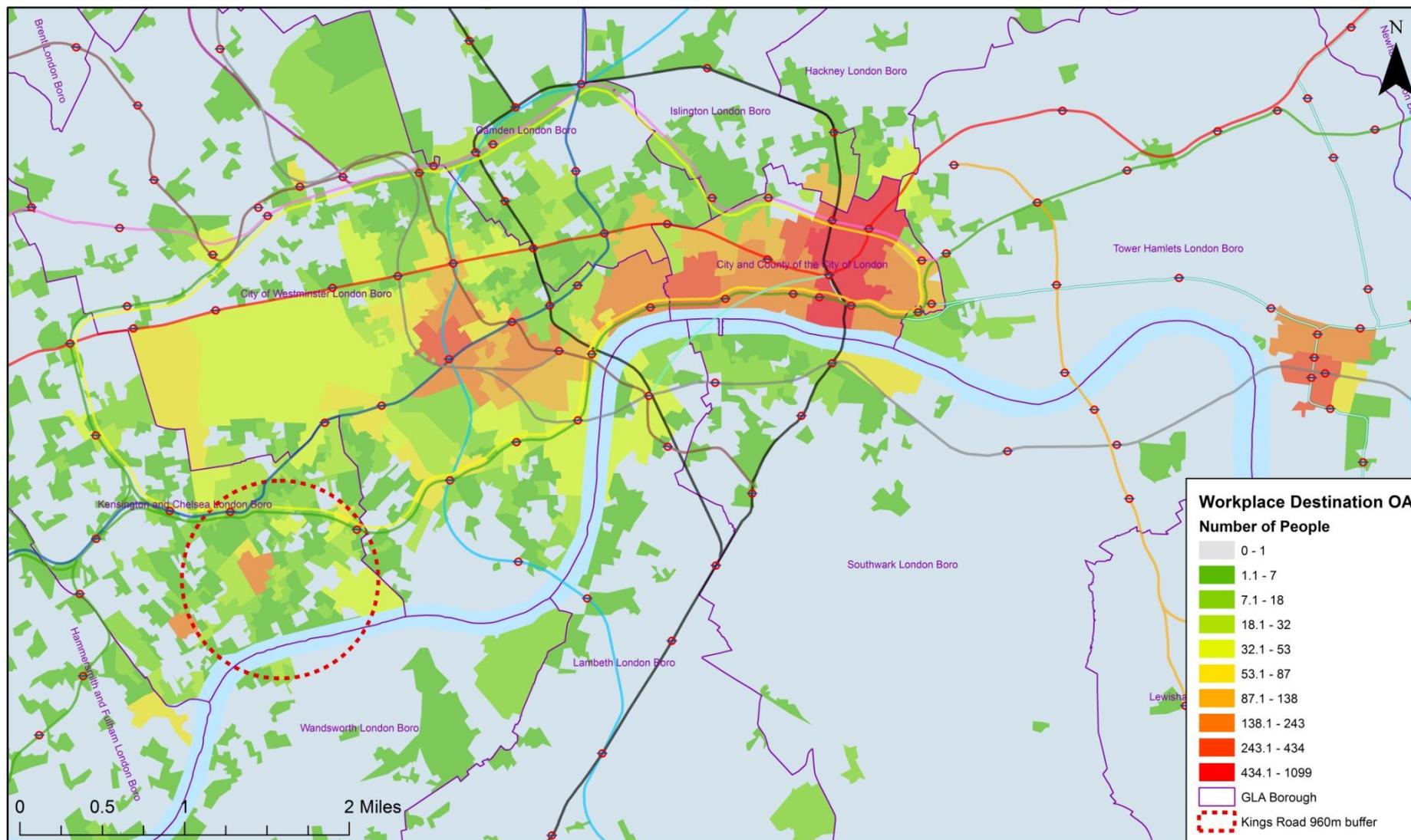
2.3 To understand who benefits from Crossrail 2, it is important to consider where people are working and how far they travel. The chart below considers the comparative distances that the residents of Chelsea travel to get to their place of work. The map on the following expands on this further indicating that the majority of residents within the 5-10km bracket tend to be working in the City or West End and the majority of those travelling 10-20km are likely to be working in Docklands. Combined, this equates for 39% of the population.

2.4 The long journey times between Chelsea and key employment centres is only part of the problem in making Chelsea a more desirable place to commute from, the crowded services on the District and Circle Lines also make travelling between home and work less appealing.

Distance travelled to work



Census 2011 - Location of workplace at OA level from Kings Road buffer



Title: Chelsea



Ref: 000004082015

Author: Oliver Turner

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Date: 05/08/2015

Status: Final

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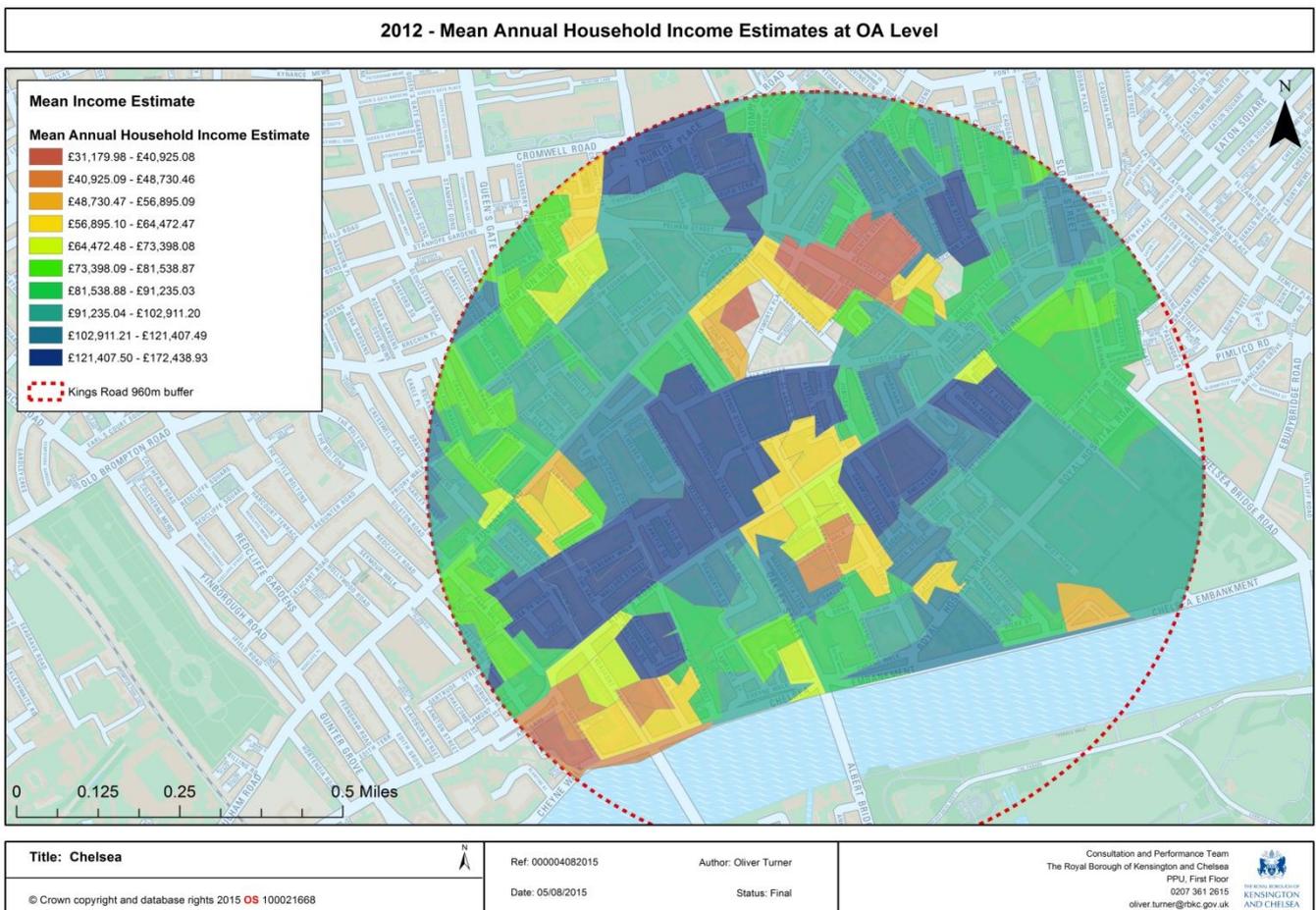
3. Employment and educational attainment

3.1 Having understood where people are travelling, it is important to understand more about the kind of work in Chelsea. Ward level data shows that between 40 and 50 per cent of residents work in professional occupations, or are managers and directors. This is significantly above the London average of 34 per cent. This is reflected in the map below which highlights the average household income of residents in the area.

3.2 This broadly tallies with the level of educational attainment in Chelsea. This shows that 55 per cent of those living in the catchment area (17,311 people) are educated to at least degree level, compared to the national average of 30 percent.

3.3 For the most part, incomes in this part of Chelsea exceed the borough, city and national averages at over £110,000 p/a. When coupled with the data on location of workplace, this paints a picture that Chelsea is home to some of the people that make London a world class centre of economic activity and financial powerhouse; helping the Capital to compete with Global Cities like New York and Paris. London needs Chelsea to provide a high quality and unique residential environment for its most productive residents and Crossrail 2 can deliver this.

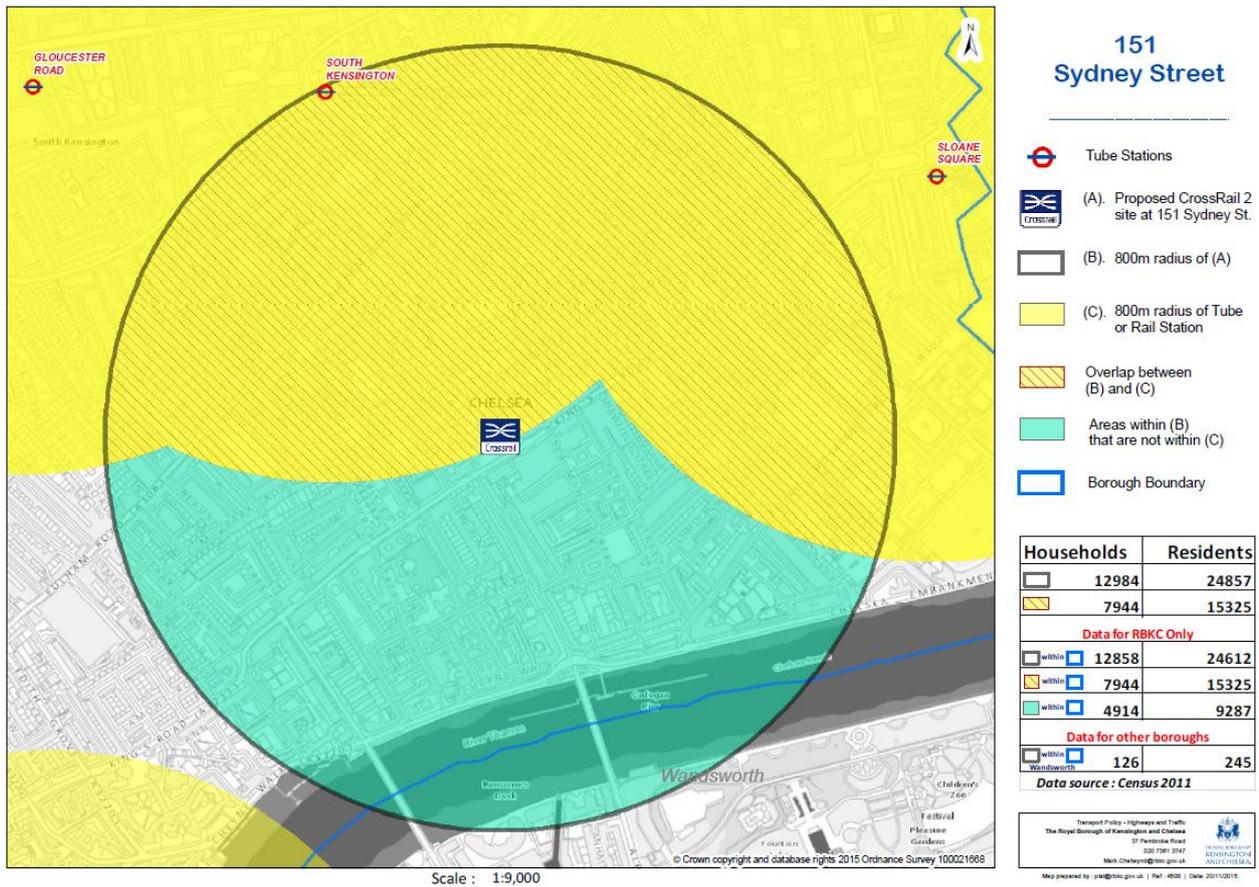
3.4 However, it is important to note that Crossrail 2 will also unlock accessibility for those households on lower incomes, living in areas of higher deprivation such as Cremorne or the Sutton Estate. Being within a 12 minute walk of a station on the King's Road will improve accessibility to jobs and opportunities elsewhere in London; helping to tackle the stark contrast of inequality in Chelsea.



4. Economic impact

Additional development

- 4.1 At present, it is estimated that there are 12,000 households within an 800m radius of a station around the Fire Station. Whilst slightly tighter than the 960m radius used in the previous section, this distance reflects a 10 minute walk and is a more directly appropriate scale for considering the immediate sphere of influence for the station.
- 4.2 Within this radius, nearly 5,000 homes are not currently within a 800m walk of an existing station. It is fair to assume that these properties stand to benefit the most from a station.



- 4.3 However, we must also consider the impact of the station on new development. It seems fair to assume that the station is likely to create even more interest from housebuilders.
- 4.4 The Borough is mindful that any development must respect the rich heritage assets that exist in and around the King’s Road but assuming this can be achieved it would be reasonable to assume densification could still happen whilst preserving Chelsea’s unique character.
- 4.5 Transport for London has assumed that roughly 850 new units could come forward. However, it the Council’s belief that in theory, as many as 3464 could be developed as the plan on the following page indicates.



4.6 This figure represents a maximum and is designed to look at capacity rather than a detailed urban design framework. Clearly, not all of these sites are available for development and nor would the Council support this level of disruption in light of the current flurry of construction in the south of the Borough. However, over the course of a 40 year period, it is not unreasonable to think that at least some of these sites will be developed. Averaged out, this equates to around 90 new units per year, just over 10 per cent of the borough's current annual housing target set by the Mayor.

4.7 The 2015 Zed Index notes that the average house price in SW3 is around £2.35 million and price per square foot of £1,900. This figure is used as a broad rule of thumb to understand the value of development in the local area.

4.8 This indicates 3464 new units would yield £6 billion NPV in Gross Development Value.

4.9 Admittedly, these are high-level assumptions based on the maximum return possible and we have not, as yet, made assumptions regarding build costs or affordable housing. Due to the Council's aspirations to deliver new affordable housing as part of the already committed estate regeneration programme, the strategic, borough-wide approach to affordable housing adopted in this report's methodology is considered robust.

Property values

4.10 Unsurprisingly, as Chelsea provides homes for some of the Capital's most economically productive people, this is reflected in the area's property prices.

- 4.11 Directly capturing the benefits within the housing market is difficult without some significant financial modelling. However, as a rule of thumb from the [2014 Nationwide House Price Index](#), those living within 500m of a station can expect a 10.5 per cent increase in property value, or 7.6 per cent if within 750m. We believe that due to the desirability of the Royal Borough, this figure could be even higher. The [recent study by Knight Frank](#) has suggested that between 2008 and 2014, Prime Central London prices within a 10 minute (roughly 800m) walk of a Crossrail station have increased 13 percent over the market average. This is in spite of the on-going construction around the stations; we can anticipate further price growth once construction is complete and the line opens.
- 4.12 It is also interesting to consider the impact on Treasury savings in terms of capital receipts from stamp duty. Admittedly, the methodology for this is somewhat rudimentary.
- 4.13 As previously quoted, the average house price in SW3 is currently £2.35 million (Zed Index, 2015). In the 12 month period up to September 2015, 295 properties were sold. Using these figures, an average stamp duty receipt of £196,312 per unit would have been generated. This equates to nearly £58m. Applying the uplift of 13% calculated by Knight Frank, the anticipated increase in value results in roughly an additional £7.5 million p/a being generated as a direct result of Crossrail 2. If calculated over 40 years, the additional stamp duty receipt would represent £300 million at present value.
- 4.14 In addition to this, the 3464 new build homes discussed in paragraphs 4.5 and 4.6 would generate more than £421m in stamp duty. When combined with the figure above, this receipt alone represents more than 70 per cent of the cost of the station.
- 4.15 Added to this is the receipt that would be generated from National Insurance and income tax arising from a percentage of the additional new households and jobs that would be created as a result of the station and line and might be lost to London if this development did not take place. As referenced in paragraph 3.3, the average salary in Chelsea is more than £110,000, meaning on average, £33,400 p/a of income tax is owed, with a further £5,500 p/a in National Insurance. If we assume just 10 percent of new residents would not be living in London without this development, this figure equates to more than £11.5 million in tax gains per year and nearly £2 million in National Insurance. However, as this methodology is relatively untested, this figure has not been included in schedule of benefits but if refined and perfected, should be assessed in Transport for London's next iteration of economic analysis for the King's Road station.

Journey time savings

- 4.16 It is anticipated, that the average journey time for those living near the King's Road station and working in the City or Canary Wharf will come down from around 45 minutes to about 20 minutes.
- 4.17 Using TfL's projected morning peak access at the station of 2,000 passengers together with their value of time: £11.57 p/hour, the average annual figure generated by each passenger would be nearly £3,000 (including outward and inward journeys). If calculated over 60 years, cost benefit saving of the station as a whole, equates to more than £275m.
- 4.18 However, this does not allow for the higher than average value of time for professions of our residents as indicated in paragraph 3.3. Within the Royal Borough, the median average earnings of residents are around 50 per cent higher than the London average (London Datastore, 2015). If this increase is applied, the 60 year cost benefit saving is more than £400m.

Business Rates

- 4.19 Whilst residential values make the economic impact on Chelsea so significant, the King's Road also has a distinctly commercial character that will add to these benefits. At present, the stretch of King's Road roughly 800m either side of the station generates £20 million per annum in business rates.
- 4.20 Unlike residential values where Crossrail 1 acts as a direct comparator, finding a retail centre of the same nature as King's Road is not possible, so speculating on magnitude of this increase would be unwise. However, it is logical to assume that rates will increase as footfall associated with the station, and consequently business profitability increases.

5. Summary

- 5.1 It is clear that the cost of the station is a significant outlay. However, positive contributions can also be made. In total, this paper has noted that around **£7.1 billion of additional economic value** (see table of benefits below) could be generated by the station through a modest increase in residential density and journey time savings; both the former and the rise in value of the existing stock of housing would generate tax receipts.
- 5.2 It should also be noted that the benefits to the Exchequer do not include the significant amounts of indirect value which could come forward from welfare savings and tax revenues.
- 5.3 More qualitative impacts on securing the success of the Chelsea Medical Quarter, and the scale of improved business rates, have not been analysed but would be expected to contribute further to the positive business case for a station.
- 5.4 Chelsea's performance as an area of desirable homes for some of London's most productive people is vital too. The better the residential offer, the more London can continue to success on a global scale.

Table of benefits

	Benefit (£billion)	Direct Exchequer Benefit (£billion)	Combined benefits (£billion)
Additional development	5.946		
Journey time savings	.400		
Stamp duty		.721	
TOTAL (Net Present Value)	6.346	.721	£7.1 billion



London Borough of Hammersmith & Fulham | The Royal Borough of Kensington and Chelsea | Westminster City Council

TRI-BOROUGH WHOLE PLACE COMMUNITY BUDGET

INFRASTRUCTURE – AN INTEGRATED APPROACH

Securing Regeneration and
Wider Economic Benefits from
Major Railway Infrastructure Projects

October 2012



INFRASTRUCTURE – AN INTEGRATED APPROACH

Securing Regeneration and Wider Economic Benefits from Major Railway Infrastructure Projects

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Executive Summary

The problem

Railway infrastructure projects are currently designed and planned as ‘silos’, purely to deliver railway schemes. This approach stifles the additional wider benefits such schemes could otherwise deliver through real estate development, economic regeneration, inter-modal connectivity, etc. and provides very little opportunity to understand the rationale behind the decision making process, and even less scope for those outside the silo to influence decisions. Timetables are set on this basis, and then modifications to take a more holistic view are regarded as ‘costs’ as they risk ‘delays’.

Why does this matter?

This report uses the example of High Speed Rail 2 (“HS2”) and Crossrail to demonstrate how a different approach, based on optimisation through a process of partnership working and integrated assessment, could deliver significant economic benefits. Our initial findings are that – if the railway design were optimised to facilitate development – then development at Old Oak Common and a Crossrail station at Kensal for Portobello could potentially yield approximately 21,000 new homes and 196,000 new jobs, with a gross value of approximately £17 billion¹ based on current land values. The additional development at Old Oak Common and Kensal would release substantial economic value, with local Gross Value Added of up to £74 billion in net present value terms (for Old Oak Common alone up to £2.3 billion would accrue to HM Treasury in the form of additional taxes). If these benefits are realised, and reflected in the appraisal of High Speed 2, then it would significantly strengthen the economic case for the project². If developed fully the Old Oak Common site alone could accommodate up to twenty-five per cent of London’s growth over the next thirty years and much of this site is in public ownership (BRBR, TfL and DfT). Kensal / Portobello could be developed from 2018, with parts of the North Pole Depot available immediately.

Options for addressing the problem

Maximising the economic value of railway projects requires Government to work with local partners in a different way. The railway infrastructure and associated development and regeneration will only be optimised where the development and regeneration potential are integrated into the options and analysis from the outset, and co-designed with those partners who are best able to identify those options. In the case of the HS2 and Crossrail projects, that means working with the local authorities to ensure that the configuration of the stations and depots at Old Oak Common and Kensal support the development and

¹ Source: H&F estimate. This figure will be verified shortly through additional economic impact assessment work

² We estimate that a £2.5 billion improvement in the net benefits of HS2 would improve the benefit: cost ratio (BCR) of that project by approximately 0.1

regeneration potential of west London. Formal consultations, such as the current consultation on safeguarding the route between London and the West Midlands, have a role to play, and boroughs will of course engage with such processes. But they are not a substitute for working in partnership from the outset of project development.

There is still an opportunity to ensure that development and regeneration opportunities are realised. The necessary changes can be made to the proposed configuration of the infrastructure. Those changes have the best chance of being optimised and implemented if the following conditions are met:

- The remit of HS2 should be broadened to include engagement with the local authorities along the route to ensure that investment in HS2 is planned to enable these areas to benefit from development opportunities around proposed stations and to deliver wider economic growth;
- The Royal Borough of Kensington and Chelsea should be invited onto the HS2 London / Heathrow Stakeholder Group;
- The assessment methodology for the project should be revised to include consideration of the regeneration benefits that the project will deliver;
- Government and Crossrail should acknowledge the wider economic benefits that a Crossrail station at Kensal /Portobello would deliver and plan the station into its future modelling of the business case and train timetabling;
- The Strategy Board of the Old Oak Common Opportunity Area Planning Framework should have a broader remit and should include Department for Transport at a suitable level of seniority (e.g. a member of the Ministerial team);
- Opportunities should be investigated for finance that can be mobilised by the development potential associated with the projects, e.g. Tax Increment Financing, Community Infrastructure Levy and/or section 106 planning obligations.

The approach advocated in this paper may be replicable elsewhere and should thereby help to ensure that the UK can secure maximum value from the programmes and projects within the Government's national infrastructure plan. Maximising the opportunities for regeneration and development on the back of major infrastructure projects needs to be a cross-government responsibility, and it is recommended that the Department for Communities and Local Government should review how it can contribute to this agenda most effectively.

1. Purpose of the Report

- 1.1 Railway infrastructure projects are currently designed and planned as ‘silos’, purely to deliver railway schemes. This approach stifles the additional wider benefits such schemes could otherwise deliver through real estate development, economic regeneration, inter-modal connectivity, etc. and provides very little opportunity to understand the rationale behind the decision making process, and even less scope for those outside the silo to influence decisions.
- 1.2 This report uses the example of High Speed Rail 2 (“HS2”) and Crossrail to demonstrate how a different approach, based on optimisation through a process of partnership working and integrated assessment, could deliver significant economic benefits. Our initial findings are that – if the railway design were optimised to facilitate development – then development at Old Oak Common and a Crossrail station at Kensal for Portobello could potentially yield approximately 21,000 new homes and 196,000 new jobs, with a gross value of approximately £17 billion³ based on current land values. The additional development at Old Oak Common and Kensal would release substantial economic value, with local Gross Value Added of up to £74 billion in net present value terms (for Old Oak Common alone up £2.3 billion would accrue to HM Treasury in the form of additional taxes). If these benefits are realised, and reflected in the appraisal of High Speed 2, then it would significantly strengthen the economic case for the project⁴. If developed fully the Old Oak Common site alone could accommodate up to twenty-five per cent of London’s growth over the next thirty years and much of this site is in public ownership (BRBR, TfL and DfT).
- 1.3 The approach advocated in this paper may be replicable elsewhere and should thereby help to ensure that the UK can secure maximum value from the programmes and projects within the Government’s national infrastructure plan.
- 1.4 This paper has been prepared by officers⁵ from the London Borough of Hammersmith and Fulham (LBHF), the Royal Borough of Kensington and Chelsea (RBKC) and Westminster City Council, during the course of preparing the tri-borough’s community budget submission to Government in October 2012.

³ Source: H&F estimate. This figure will be verified shortly through additional economic impact assessment work

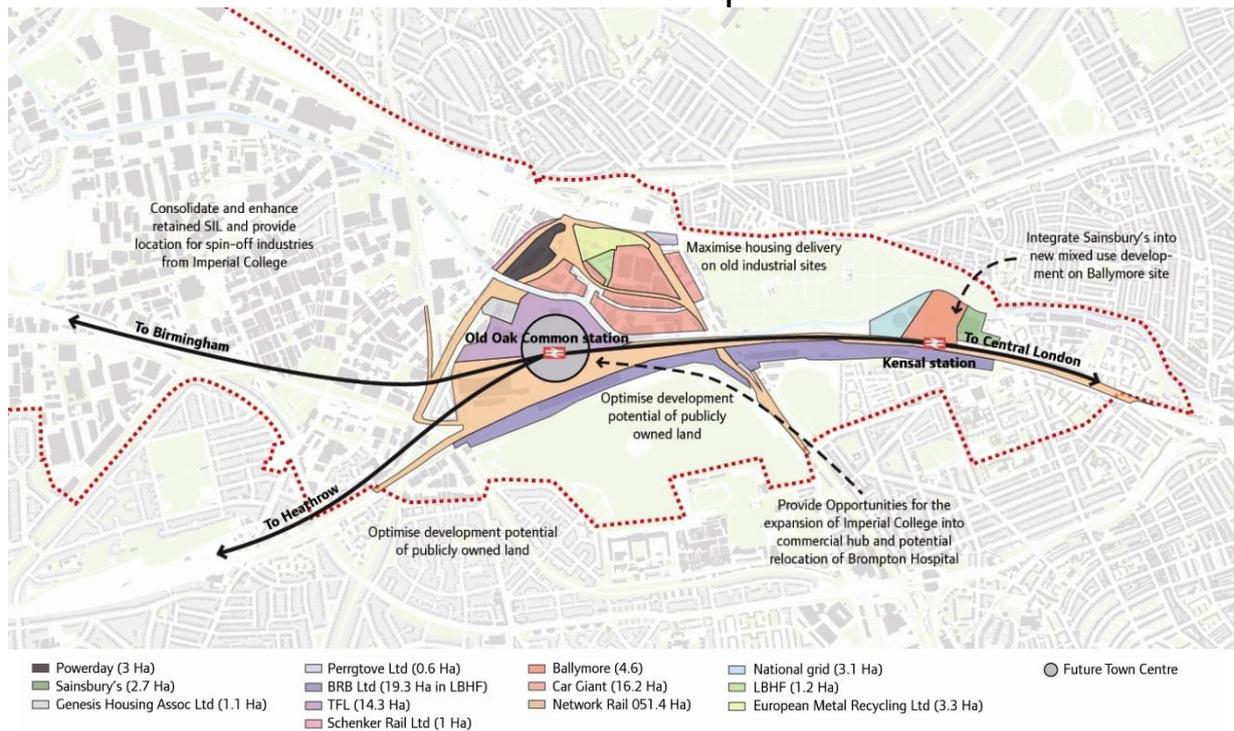
⁴ We estimate that a £2.5 billion improvement in the net benefits of HS2 would improve the benefit: cost ratio (BCR) of that project by approximately 0.1

⁵ See Appendix B for a list of contributors to the report.

2. Current Proposals

2.1 The map below shows the location of the proposed HS2 and Crossrail Stations at Old Oak Common and Kensal and adjacent land ownerships.

Location map



HS2 Old Oak Common Interchange

2.2 As part of the High Speed 2 rail link from Birmingham to London, a new station will be built at Old Oak Common in the north west of London. Old Oak Common could become a new transport super hub for London linking to Birmingham (38mins), Heathrow (11mins), central London (15mins) and potentially to Watford and Milton Keynes. The journey time to Birmingham would be shorter than to Gatwick, making a second runway at Birmingham a realistic alternative or addition to further development of Gatwick, Heathrow or a new London airport. This level of connectivity will transform the surrounding areas, which are currently quite inaccessible, but this impact is not considered in HS2 / Crossrail station design or the government's investment decisions.

2.3 The current HS2 Ltd remit is to deliver the proposals as set out by the Department for Transport in January 2012. This includes the following:

- Old Oak Common will provide an interchange between HS2 and Crossrail services;
- A 14 platform station is envisaged at Old Oak Common, with 6 platforms for HS2 services and 8 platforms for Crossrail/Great Western Main Line (GWML) services.

2.4 On construction and operational cost grounds the station at Old Oak Common is currently being planned as a sunken, open-box station without enabling any associated development. Indeed, without an integrated approach, such a scheme might frustrate or blight future commercial investment and development.

2.5 At the time of finalising this report, DfT has just launched a consultation on safeguarding the HS2 Phase 1 route. We will seek early engagement with HS2 on the safeguarding lines, particularly in relation to construction sites and their potential implications for early development. It is important that the Safeguarding Direction does not preclude upcoming planning applications in the HS2 Old Oak station area that relate to the regeneration of the area and integration of HS2 with the local community.

Kensal (Portobello) Crossrail Station

2.6 In order that a Crossrail station could be installed at a future date, Parliamentary assurance was given to RBKC to provide clear tracks - so called 'plain lining' - when the Crossrail Act went through parliament. RBKC is working with the Crossrail sponsors to establish a Crossrail Station at Kensal for Portobello. It is hoped that, once further modelling on both the business case and train timetabling has been completed (envisaged by Spring 2013), and discussions regarding financial undertakings of the Council have been resolved, the station will be included in the Crossrail construction programme, to open as part of the overall Crossrail project in 2019. Work completed to date suggests that a rail link is the only direct way of connecting Kensal to Old Oak Common. This will also be vital to bring forward the first phases around Old Oak Common before that station opens.

Crossrail Depots Old Oak Common

2.7 Alongside the proposed HS2/Crossrail interchange station at Old Oak Common, there are proposals within the current Crossrail Act to provide a stabling depot and maintenance depot on land to the north of the station covering an area of approximately 13.7 hectares of land.

North Pole Depot

2.8 North Pole Depot runs from Ladbroke Grove in RBKC to Old Oak Common Lane in LBHF, running to the south of the West Coast Main Line. The depot had previously been used in association with

Eurostar. The site is owned by the Department for Transport, currently held by the British Rail Board (Residuary) Ltd (BRBR) which is shortly to be disbanded. The western part of the depot has been leased for a depot to 2038, as part of the Intercity Express Programme (IEP), related to the electrification of the Great Western Mainline (GWML). Most of the land to the east of Scrubs Lane, however, has been provisionally earmarked for development by BRBR. However, it is now likely some of the site might be required for depot facilities displaced by the HS2 project.

3. Issues with the Current Approach and Missed Opportunities

HS2 Old Oak Common Interchange

- 3.1 In functional terms the station will primarily act as an interchange enabling High Speed 2 passengers to transfer on to Crossrail and Great Western Main Line, reducing pressure on the HighSpeed Terminus of Euston.
- 3.2 The location of the new station, although at the junction and confluence of a number of major railway lines, currently has no national rail station on the site. The site is located at the centre of the Park Royal/Willesden Junction Opportunity Area identified in the London Plan, and adjacent to Kensal Canalside Opportunity Area. The wider area is predominantly industrial but it is also home to a number of residential communities as well as natural assets including Wormwood Scrubs and the Grand Union canal. The opportunity area has the potential for major mixed use development and it is important that the new High Speed 2 station plays a role in this regeneration.
- 3.3 It would be possible to design a station that focuses almost entirely on interchange passengers with no interaction with the surrounding area. However this would be a colossal failing in forward planning and would mean that a once in a lifetime opportunity to regenerate this area would be missed.
- 3.4 It is for this reason that the GLA, Transport for London and the surrounding local authorities - Hammersmith & Fulham, Royal Borough of Kensington & Chelsea, Brent and Ealing have started the production of an Opportunity Area Planning Framework (OAPF) for the area, which looks at the potential for regeneration around the new Old Oak Common station.
- 3.5 As part of this work, the authorities have set out three overarching principles for the station design:
 - To support the major development of the surrounding Opportunity Area;
 - To create a strategic transport interchange for west London as set out in the Mayor's Transport Strategy; and
 - To relieve pressure at Euston.
- 3.6 The authorities feel that in order to satisfy the above objectives, HS2's station remit would need to be changed so that:
 - The station is designed to allow for over station development;

- The station is designed with entrances that fit with the emerging plans for the Opportunity Area; and
- The station design allows for the re-routing of the North London Line and West London Line to a new station sitting between the HS2 station and the Crossrail/GWML station.

3.7 The initial findings of the work on the OAPF indicate that if the station were to be designed to take over station development, there would be capacity for up to 800 homes and 14,300 jobs, releasing a minimum of £1.9 billion⁶ gross value based on current land values. Furthermore, development in the vicinity of Old Oak Common Station could potentially yield approximately 19,000 new homes and 190,000 new jobs in 4.6 million square metres of floor space with a gross value of approximately £15.1 billion based on current land values⁷.

3.8 Under the current proposals, transport modelling has estimated that 30% of travellers into London on the High Speed 2 line will stop at Old Oak Common, with the remaining 70% travelling on to Euston. The inclusion of the potential for a North London Line/West London Line connection has been estimated to alter this dispersal split so that 40% of passengers would disembark at Old Oak Common, with only 60% therefore travelling on to Euston. This would have profoundly positive impacts on the ability of the London Underground system at Euston being able to cope with passenger numbers. The proposed connection would also drastically reduce travel times for residents and businesses in western, southern and eastern London to Heathrow and to the new High Speed 2 line.

Crossrail Kensal Portobello station

3.9 This significant development site, consisting largely of the existing and former gas works, was allocated as a strategic development site in the RBKC Core Strategy (adopted 2010). RBKC has prepared an issues and options paper as a first step for the preparation of a Supplementary Planning Document or Local Plan for the site, which offers three broad options, ranging from 2,000 – 3,500 new homes and up to 2,000 jobs⁸, depending on the provision of a station (see above). This shows how a station would stimulate significantly increased regeneration benefits for the area than could be achieved by the development of the adjacent sites without a station. The site comprises:

- Sainsbury's and Ballymore's landholdings to the north of the railway, fronting Ladbrooke Grove and in part the canal. There is an existing Sainsbury's supermarket that would be reprovided as part of the redevelopment. Crossrail have required, via a Transport and Works Act Order, the use of Ballymore's land (which currently has no permanent use) for construction of Crossrail and are

⁶ Source: H&F estimate this figure will be verified shortly through additional economic impact assessment work

⁷ Source: as above

⁸ Source: RBKC Kensal SPD Issues and Options

resisting pressure to provide an end date for this requirement. This uncertainty is delaying the development of these sites.

- National Grid, with two gas holders which are programmed for decommissioning and ancillary equipment and housing. National Grid have recently announced decommissioning dates for all of their gas holders in London. The date for mothballing the Kensal holders has just been confirmed as November 2012, but the date for decommissioning remains to be confirmed. Consequently 1.7 ha of the site remains subject to the Health and Safety Executive's Consultation Zone requirements and cannot be developed. The landowners have long argued (with the support of the Council) that these requirements, and indeed, the arcane process of responding to proposals, require updating. However, opportunities to debate these matters have been very difficult to secure.
- Part of North Pole Depot, to the east of Scrubs Lane (the remainder of the depot is dealt with separately in this paper - see below). Crossrail have recently begun to acquire part of the North Pole Depot near the entrance to the site for a maintenance depot, which is being relocated from Old Oak Common. This is not good economic use of the land which could have a site value of as much as £53⁹m if used for residential and commercial, with a development capacity of around 850¹⁰ homes. Crucially redevelopment of the eastern end of North Pole Depot is an integral part of the regeneration of Kensal, as it will allow for a bridge over the railway line, providing access from the surrounding housing to the proposed Kensal Crossrail station, and better integration of the development sites to the north into the surrounding area. Whilst the land take is only 1,500 sqm its location at the gateway to the site will adversely affect the desirability and financial uplift of this publicly owned land. Despite requests from RBKC and BRBR, Crossrail have rejected this argument and refused to investigate alternative locations, stating that the needs of the network outweigh all other concerns.

3.10 Work by Regeneris, an economics consultancy firm, has shown that compared to other Crossrail stations, the Kensal for Portobello station represents a significant regeneration opportunity, being the 5th most deprived location for a new station. A Crossrail station at Kensal could deliver in the region of £690m additional economic benefits for the wider community, without additional call on the public expense¹¹. The Royal Borough has agreed to underwrite the £33million cost of the station, although the intention is that this will ultimately be met through developer contributions. All that is required is commitment to include a station at Kensal as part of the Crossrail programme. Recent work by GVA has identified that the uplift in property values as a result of having a Crossrail station is in the region of 20 per cent. RBKC are seeking to confirm what the uplift for Kensal/ Portobello would be¹².

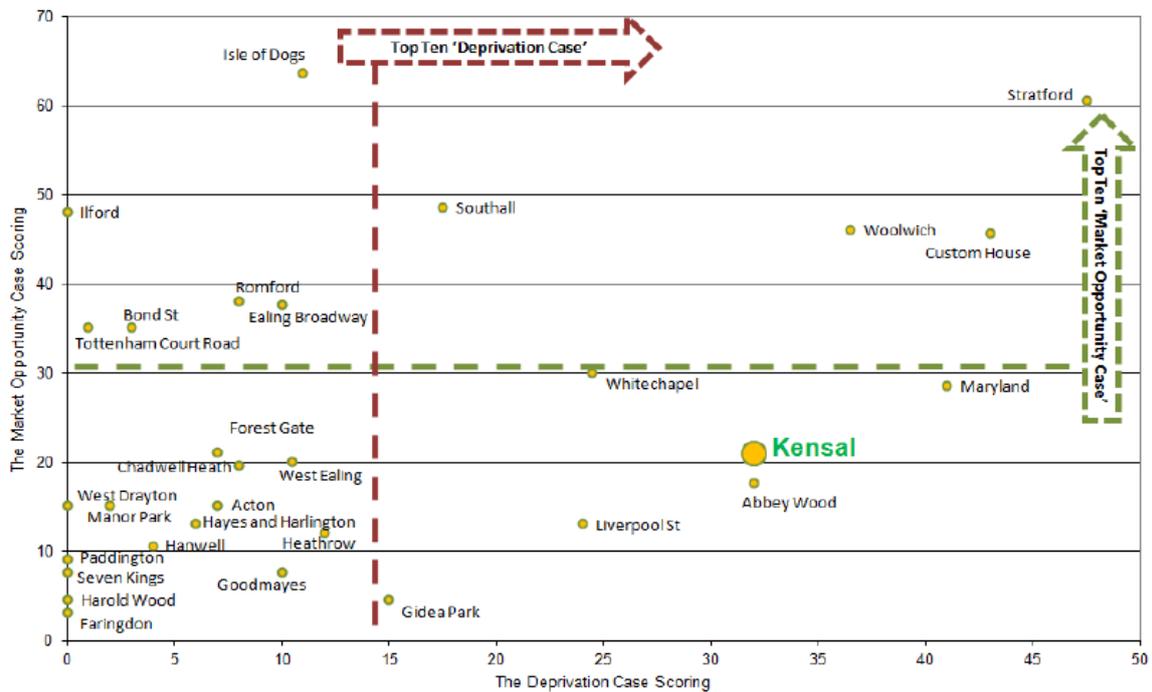
⁹ Source: Knight Frank August 2011 (unpublished report)

¹⁰ Source: Urban Initiatives North Pole Depot Masterplan 2011 (unpublished)

¹¹ See http://www.rbkc.gov.uk/pdf/crossrail_note_on_results2.pdf for further detail.

¹² GVA Crossrail Property Impact Study 2012

Crossrail regeneration benefits



Crossrail Depots Old Oak Common

3.11 The Old Oak Common Economic Impact Assessment has identified that the Crossrail stabling depot and maintenance depot sites, if developed, have the potential to provide 4,500 homes and 9,500 jobs, or approximately 685,000sqm of floor space generating approximately £1.1 billion¹³ of gross added value, based on current values in the area. The Crossrail land also sits between the station and what is considered to be one of the biggest areas of development potential in the vicinity of the HS2 station to the north of the canal. The inclusion of the Crossrail stabling and maintenance depots within any development scheme is therefore integral in order to make a viable place.

3.12 The authorities acknowledge that there are problems with altering the plans set out in the Crossrail Act, but believe that were plans for the HS2/Crossrail station to proceed, the HS2 Bill would provide a mechanism to relocate the Crossrail stabling and maintenance depot and realise the development potential that the site could deliver and the potential for this to strengthen the business case for HS2. The probable expansion of Crossrail to Reading and the electrification of the GWML provide other options for reviewing depot allocation and the current proposals for terminating 14 trains per hour at Westbourne Park looks like a poor return on the investment in Crossrail when other options for improved services are possible utilising new rolling stock and electrified routes.

¹³ Source: H&F estimate this figure will be verified shortly through additional economic impact assessment work

North Pole Depot Hammersmith and Fulham

3.13 The western part of North Pole Depot will be used as a new IEP Depot and will have a lease until at least 2038. Through discussions with the Department for Transport it has become apparent that this is fixed and there will be no opportunities for the release of this part of the depot site for development opportunities in association with the new HS2/Crossrail station. This is regrettable. Work on the OAPF has shown that this site has the potential to deliver up to 2,000 homes and 4,150 jobs or approximately 250,000 sqm of development with a gross development value of almost £2 billion¹⁴. The authorities believe that, were the HS2 scheme to proceed, consideration should be given to finding an alternative site for the IEP depot in order that the development potential of this section of the North Pole Depot can be realised.

3.14 More generally, the North Pole Depot site also provides the potential for an east-west connection between Old Oak Common Lane, Scrubs Lane and Ladbroke Grove, which could potentially have a huge impact on increasing accessibility to the new High Speed 2 station, as well as relieving pressure on the surrounding road network, particularly at Harlesden which is currently afflicted with severe traffic congestion.

Summary – the extent of the opportunity

	Homes	Jobs	Gross Development Value (homes plus non-residential)	Gross Value Added
Kensal with a Crossrail station 2014 – 2030	2,500	2,000	£1 bn	£700m ¹⁵
Old Oak Common				£73bn ¹⁶
- Over station	800	14,300	£1.9bn	
- Around station	17,500	180,000	£14.1bn	
Total	20,800	196,300	£17 bn	£74bn

¹⁴ Source: H&F estimate this figure will be verified shortly through additional economic impact assessment work

¹⁵ Economic Impact Assessment of Crossrail: Kensal addendum

¹⁶ Old Oak Common Economic Impact Assessment

4. New Approach

- 4.1 This paper calls for a new approach, under which the Mayor, Network Rail, DfT and HS2 would work together to deliver these rail infrastructure schemes in a way that maximises wider regeneration benefits and integrates with emerging Opportunity Area Planning Frameworks for Old Oak Common and Park Royal. That means not only looking at **what** will be built, but also the optimum **sequencing**, since this will affect when land values can be liberated. Together, these parties would investigate:
- The potential for Old Oak to become a major transport interchange for London, including links to existing and new transport infrastructure in the vicinity (with economic benefits estimated at £73 billion);
 - How the station design can support major regeneration of the surrounding area and how this regeneration can support the economic case for HS2;
 - The case for a Crossrail station being opened at Kensal / Portobello at the time Crossrail starts operating (with economic benefits estimated at £700 million), together with the opportunity to bring forward the first phases of development around Old Oak Common before that station opens.
- 4.2 Governance will be crucial. This project is about bringing the expertise of relevant parties to the table to co-design value-adding approaches. At the same time, the arrangements must avoid the risk of confusing responsibilities for the delivery of a complex railway project to time and budget.

HS2 Governance

- 4.3 The remit of HS2 was set out in January 2012¹⁷ and is being revised in November 2012. The remit also includes a commitment to provide a document detailing sponsors' requirements early in 2012 but it is not clear if this has materialised. In summary the remit covers:
- Delivery of a safe and affordable route design;
 - Assessment of the environmental impacts of this design and production of the Environmental statement;
 - Consultation with all relevant bodies on aspects of the proposals;
 - Continue current work on developing routes from the West Midlands to Leeds, with a connection to the West Coast Main Line, and a spur to Heathrow, to include appropriate engineering designs and sustainability appraisal and the implications for the whole Y network;

¹⁷ See <http://www.hs2.org.uk/publications/HS2-Ltds-remit-of-11-January-2012-79709>

- Prepare materials and provide advice to develop and inform informal consultations necessary to develop proposals for High speed rail;
- Undertake strategic work on the longer options for serving Scotland and the North East;
- Continue to advise DfT on costs, transport benefits and commercial issues so that the business case for the London to West Midlands phase of the whole Y-shaped network can be updated and costs controlled.

4.4 We would recommend that this remit be amended to include:

- Engage with the local authorities along the route to ensure that investment in HS2 is planned to enable these areas to benefit from development opportunities around proposed stations and to deliver wider economic growth.

4.5 The HS2 London / Heathrow Stakeholder Group is:

- London Councils
- London Borough of Hammersmith & Fulham
- London Borough of Camden
- London Borough of Hounslow
- London Borough of Ealing
- London Borough of Hillingdon
- Slough Borough Council
- Westminster City Council
- Greater London Authority
- South East England Development Agency
- London Chamber of Commerce and Industry
- Thames Valley Economic Partnership
- London First
- CH2M Hill
- Network Rail
- Transport for London, London Rail
- Crossrail
- BAA

4.6 RBKC is not currently a member of the HS2 London/ Heathrow Stakeholder Group although connection into Old Oak Common and the development of Kensal are key issues for the borough. RBKC ought to be invited onto that group.

The Economic case for HS2

4.7 The wider economic impacts of HS2 are currently assessed in terms of impacts on:

- agglomeration - improvements in urban transport networks, to local rail services and road congestion relief as a result of released capacity;
- imperfect competition - increased output as a result of reduced transport costs;
- labour market impacts – reducing time and cost of travelling.

4.8 We would recommend that the assessment methodology is revised to include consideration of the regeneration benefits that the project will deliver. By bringing the boroughs into the process of project governance and co-design, greater confidence can be gained that the regeneration benefits will be realised, thereby improving the robustness of the project economics.

Crossrail

4.9 Government / Crossrail should acknowledge the wider economic benefits that a Crossrail station at Kensal for Portobello would deliver and therefore plan the station into future modelling on both the business case and train timetabling.

OAPF Governance

4.10 Details of the OAPF Governance structure can be seen in Appendix A. The main problem presented by this structure is that it is designed to meet the technical requirements of delivering a project of this kind. The Strategy Board is made up of the GLA Deputy Mayor, Leaders (or other representatives) of four boroughs (LBHF, RBKC, Ealing, Brent) and TfL Planning. There is no strategic representation from DfT that could allow consideration of wider national priorities like using investment in major infrastructure projects to deliver economic development.

4.11 The board could have a broader remit which includes all of the infrastructure to be put in place at Old Oak Common / Kensal and to include DfT (e.g. a member of the Ministerial team). Consideration would need to be given to protecting any planning proprieties (e.g. separation from any powers that DCLG Ministers have under the spatial planning processes and, if relevant, any similar considerations under the HS2 hybrid bill process). Potentially, this body could have a life extending beyond the planning process.

Mayoral Development Corporation

4.12 The possibility of a Mayoral Development Corporation (MDC) for Park Royal, Old Oak Common and Kensal Canalside has been mooted. Whilst this may be desirable to bring forward this site in an

integrated manner and deliver benefits to London as a whole, it would not be sufficient to tackle the all the issues identified in this paper. The 'silos' we have identified are within DfT, HSE, Crossrail and HS2 and therefore outside the scope of a MDC.

Funding

4.13 This project has identified instances where additional up front funding could have safeguarded longer term development opportunities. For example, the decision to build the Crossrail stabling and maintenance depots without the necessary piling to support over-development will mean that to develop these sites at a later date, the depots will need to be relocated.

4.14 It is possible that Tax Increment Financing could be used to cover additional costs like these. Alternatively local authorities should have the option to consider underwriting additional costs against future CIL/ s106 receipts, much as RBKC has committed to underwrite the cost of Kensal station (whilst intending that landowners should ultimately fund the station through developer contributions).

Benefits

4.15 To London and the wider economy:

- The plans that emerge are optimised overall in terms of what gets built (and when). With a development befitting a major interchange, Old Oak Common could provide up to a quarter of London's employment growth (London Plan figures) and a major contribution to housing development and therefore housing affordability.
- By maximising the connections of existing overground and underground lines into HS2, the interchange has the potential to divert passengers away from Euston, which will be of benefit to Westminster as well as Camden.
- Through connecting to the North London Line and West London Line, connectivity with London as a whole is further improved, drastically reducing travel times for residents in western, southern and eastern London to Heathrow and to the new HS2 line.
- The new station at Old Oak will transform an area of Hammersmith and Fulham characterised by low density employment uses into one of the best connected areas of London, with the capacity for significant development.
- RBKC, along with Brent and Ealing, abuts the Old Oak Common area and the facility will thus have benefits for its residents. The Crossrail station at Kensal /Portobello can bring significant growth benefits to a very deprived part of RBKC, without the need for public funding.

4.16 To HS2:

- Potential for development benefits arising from the development to contribute towards the cost of infrastructure.
- Potential improvement to BCR
- Participation of the boroughs will help generate buy-in to the proposals.

4.17 To Crossrail:

- Delivery of additional regeneration benefits through serving a neighbourhood which is the fifth most deprived on the Crossrail route with a station at Kensal that would generate £690m additional economic benefits.

4.18 To the GLA/TfL:

- A success for the OAPF process.
- Potential Mayoral Development Corporation.
- Accommodating 25% of London's growth over the next 25 years.

5. Timing

HS2

- 5.1 It is anticipated that the remit for High Speed 2 will be fixed in September/October 2012. It is therefore a matter of urgency that any alteration to HS2's remit is agreed and implemented as soon as possible.
- 5.2 As part of the OAPF work, the authorities have commissioned a study looking in greater detail at the economic benefits that can be achieved through development around the HS2 station. This study focuses on value uplift and the sequencing of infrastructure delivery and development sites in order to realise the greatest value from development. Further work is being commissioned on the net value of development and extrapolating its impact on London which can be used to strengthen the business case for HS2. It is anticipated this work will be concluded by the end of 2012.
- 5.3 The authorities are working with Transport for London on the case for connecting the HS2/Crossrail station at Old Oak Common to the North London Line and West London Line. The initial work has been shared with the Department for Transport.
- 5.4 The authorities are in the process of producing plans for the design of the HS2/Crossrail station. These plans will show how the authorities envisage that the station could be designed so that it maximises the station's impact on the regeneration of the surrounding area, through its contribution to a sense of place and through the creation of a welcoming public realm within and outside of the station.

Crossrail Depots

- 5.5 Crossrail are currently in the process of appointing a development partner to deliver the Crossrail depot sites. It is important that any solution is designed to allow for the potential release of these sites for development at a future date.
- 5.6 The economic benefits study identified the benefits of the inclusion of the Crossrail depots within a comprehensive approach to the regeneration of the Old Oak Common area as £700 million.

Kensal / Portobello Crossrail Station

- 5.7 In order to ensure that the station at Kensal can be inserted into the Crossrail programme without causing delays, a decision on a station at Kensal is required before the end of 2013. Prior to that date discussions surrounding the businesses case and timetable modelling need to have been concluded.

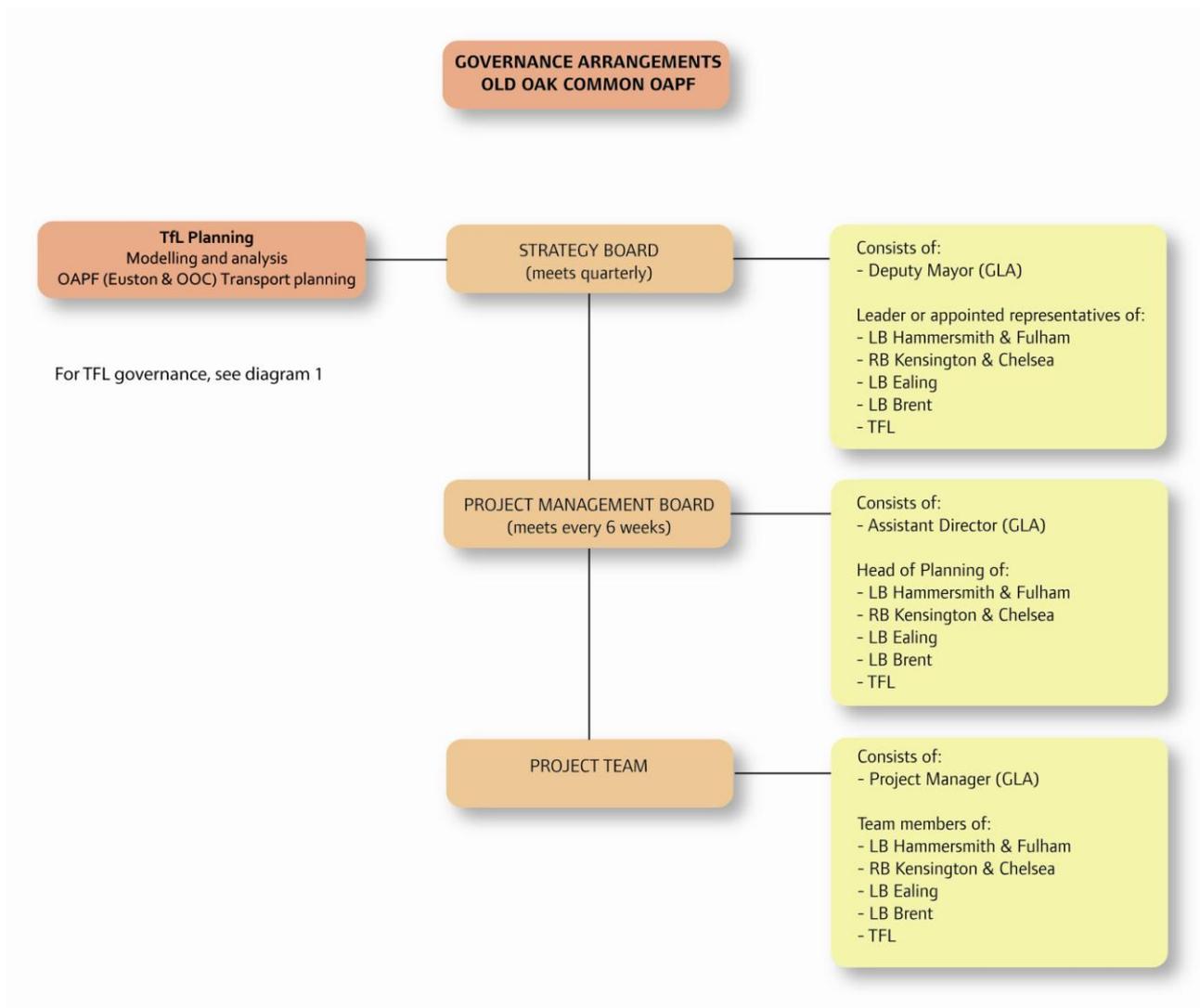
North Pole Depots

- 5.8 The economic benefits study identified the benefits of inclusion of the western part of the North Pole Depot to be used by electric trains to 2038 within a comprehensive approach to the regeneration of the Old Oak Common area as £200 million
- 5.9 The depot use is ill-conceived and whilst it may represent an optimum railway solution, it is important that the wider benefits of using the site differently. Early confirmation that the eastern part of North Pole Depot will be released for development (rather than be used for a depot) would significantly aid the project, as it is integral to ensuring the main sites can be connected effectively into the surrounding urban area.

6. Replicability

- 6.1 Many of the processes that are involved in major transport infrastructure projects are similar, so the ideas presented in this paper can have broader application, although this would need to be tailored to the specific circumstances. The particular lessons that can be learned by taking a different approach to this project, which could be adopted elsewhere are:
- Focussing from the outset on integrating the transport project with the wider benefits that can be realised;
 - Involving local partners in the design and governance of the project, in a way that generates buy-in, maximises benefits, allows local partners to make a contribution to the success of the project but without blurring accountabilities for delivery;
 - Ensuring that where decisions are made that prevent development, now or in the future, the value of the lost development is identified and acknowledged in the cost benefit assessment, and conversely ensuring that regeneration benefits that are delivered are included as benefits;
 - Allowing Local Authorities to be part of the design decision making process so that they have the option to consider calling upon alternative funding mechanisms like s106, CIL or Tax Increment Financing in order to deliver wider economic benefits from infrastructure investment.
- 6.2 Whilst the Department for Transport is the lead department for major transport infrastructure projects, maximising the opportunities for regeneration and development on the back of such projects needs to be a cross-government responsibility. In particular, the Department for Communities and Local Government would have a strong interest in ensuring that regeneration and development are factored in at the earliest stages of project development, and it is recommended that DCLG review how it can contribute to this agenda most effectively.

Appendix A: Opportunity Area Planning Framework Governance



Appendix B: Contributors to the Report

This report has been written with contributions from:

London Borough of Hammersmith & Fulham

- Chris Bainbridge, Head of Transport Planning
- Thomas Cardis, Policy & Projects Officer
- Gordon Prangnell, Head of Highways and Construction
- Farrah Rossi, Principal Projects Officer

The Royal Borough of Kensington and Chelsea

- Joanna Hammond, Neighbourhood Planning Team Leader
- James Masini, Neighbourhood Planning Officer
- Penelope Tollitt, Head of Policy and Design

Westminster City Council

- Graham King, Head of Strategic Planning & Transportation
- Barry Smith, Operational Director

Tri-borough Whole Place Community Budget Team

- Mark Davis, Theme Lead (Economic Opportunity)



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Royal Borough of Kingston upon Thames
Response on National Infrastructure Commission Call for Evidence
London's Transport Infrastructure

The Royal Borough of Kingston upon Thames welcomes the creation of the National Infrastructure Commission and its objective of providing independent advice to government on long term investment choices. We are pleased to provide comment on the following questions relating to London's transport infrastructure.

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

The predictions for population growth and associated requirement for jobs represents one of the major challenges facing London. Working with partners, this Council is striving to deliver against London Plan targets with ambitions for sustainable growth within the borough, and notably in and around a number of well connected key locations in the Borough. The Council is proactively engaging to shape growth to encourage high quality, innovative development of exemplar design and sensitively integrated within its surroundings.

However, there is an overriding need to balance housing provision with the location of new jobs to create balanced and sustainable communities. Population growth in our area needs to be matched by significant local growth in employment, otherwise most new job opportunities will be concentrated in central London and create even greater pressure on our already constrained radial transport routes. Appropriate mixed use development is key to achieving successful redevelopment and intensification, particularly in central locations. Metropolitan centres such as Kingston need to become a focal point for new jobs and transport oriented development, helping reduce the need for radial trips to central London. Investment in high capacity orbital links are therefore needed to kick-start both housing and employment growth more evenly across the region. This is particularly important accounting for the fact that the South London Sub Region has the lowest connectivity of any sub-region which is a principal constraining factor on our economic growth.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

Kingston strongly supports the Crossrail 2 initiative which is desperately needed to address severe capacity constraints in the public transport network and also support the growth in housing and jobs which is predicted across the area in the coming years. Crossrail 2 will help address some of the key imbalances that exist in Kingston, in particular its poor connectivity by rail and lack of tube/tram connections and over reliance on the bus, which are all evident despite its status as a Metropolitan Centre. Importantly, it would facilitate the creation of new investment markets (for employment and residential use) above and beyond the scale of which could be delivered without Crossrail 2, for example at Tolworth.

Crossrail 2 would transform travel to and from the area providing direct train services to destinations across the region with increased capacity for many more people travelling in peak periods, helping relieve crowding and congestion. Enhanced journey times to central London (particularly from the south of the borough) and the provision of step-free access at all stations on the proposed Crossrail 2 route are seen as major steps forward and improvements that many local people have been requesting for some time.

Crossrail 2 will make London's financial and business districts more accessible to Kingston residents, with improved and more frequent services. It will also make Kingston's unique cultural and shopping offering more accessible to the rest of London. Through Crossrail 2, the Council wishes to take the opportunity to explore the potential of remodelled and reconstructed stations in Kingston, Tolworth and New Malden centres to secure better connectivity into the towns.

South London Boroughs would benefit from improved orbital rail links between key centres such as Kingston, Croydon and Wimbledon. This is a matter that boroughs in South West London have been pursuing for many years through various transport forums. There is potential for improvements to orbital travel for all modes, in particular linking key metropolitan centres to areas of housing growth.

Bus operations are of particular importance to Kingston due to the current lack of alternative public transport options. A package of significant bus measures would be of particular benefit in the area to provide more frequent and reliable services and new routes.

In terms of cycling infrastructure, the current mini-Holland initiative, which is being trialled in 3 London boroughs including Kingston, is a major opportunity. The success of these measures will be tested and no doubt the potential for rolling out similar initiatives on a London wide basis will be assessed.

There is also the need to consider interdependencies between investment in numerous areas of infrastructure in terms of delivering optimum levels of development. For example, at Tolworth, while Crossrail 2 is an essential piece of public transport infrastructure which will help facilitate growth in this area of opportunity, there is an associated requirement to improve the A3/A240 road intersection and identify supporting new road arrangements in the area which will help free up space for the required redevelopment. In particular this involves reducing the severance effect that the A3 Trunk Road has on this area.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

RBK strongly supports the increased benefits of the Regional scheme over the Metro scheme. The Regional scheme would bring significant benefits to a many outer London boroughs which would otherwise see little benefit from the alternative Regional scheme. It includes a number of south west branches that would make a real difference enabling sustained growth in our boroughs. We believe that the benefits, both transport and non-transport, will probably be maximised with the current scheme and that any further route extensions or new stations would simply add increasing complexity for marginal benefits. Crossrail 2 will promote new and sustain existing community infrastructure and business growth in outer London to support and create balanced sustainable communities.

The Regional scheme would see significant funding through future growth while the use of existing railway tracks in outer London will certainly contribute significantly to reduced overall scheme costs. Any cost cutting resulting in the loss of branches or stations, capacity or frequencies would undermine the viability of the project and specifically the benefits to our residents and businesses.

The Council is currently working with the Greater London Authority (GLA) and Transport for London (TfL) to produce an Opportunity Area Planning Framework (OAPF) for Kingston with Kingston Town likely to be designated an Opportunity Area in the updated London Plan. Crossrail 2 is a major piece of supporting infrastructure in the facilitation of such growth. Key sites in and around the town centre are being identified for redevelopment including

intensification and potential land use changes. There is also the possibility of a similar approach being adopted for the Tolworth and New Malden areas of the borough with associated supporting studies. In particular, there are potentially a number of significant development sites in Tolworth that could optimise their development potential and an associated change in land use patterns through the provision of a Crossrail 2 station.

Recent economic studies report Kingstons' relatively poor levels of rail connectivity being a major contributory factor in the town having failed to attract significant new office development in recent times. Crossrail 2 provides a significant opportunity to attract investment to secure the employment potential offered by Kingston town centre as well as creating new strategic markets for employment use in Tolworth, New Malden etc.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

Crossrail 1 is being funded through a combination of fares revenue, the Business Rate Supplement and Mayoral Community Infrastructure Levy (CIL). The London wide benefits mean that there is a need to press the Mayor, TfL and government to reflect the Crossrail 1 approach to securing funding from all London Boroughs for Crossrail 2 (and Councils that will see benefits from additional rail capacity, connectivity and economic development). To propose funding is drawn only from the boroughs or developments that directly benefit from the south west to north east routes would be seen as inequitable and as such unacceptable to our communities and businesses.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

We recognise the value of learning from the experience of cities around the world in terms of funding and delivering transport infrastructure in many innovative and effective processes.



National Infrastructure Commission: call for evidence

Royal HaskoningDHV Response

07/01/2016

1.0 Introduction: Setting the context for our response

Royal HaskoningDHV is an independent, international engineering and project management consultancy with more than 130 years of experience. Backed by the expertise and experience of 7,000 colleagues all over the world, our professionals combine global expertise with local knowledge to deliver a multidisciplinary range of consultancy services for the entire living environment from over 130 countries. By showing leadership in sustainable development and innovation, together with our clients, we are working to become part of the solution to a more sustainable society now and into the future.

In the UK, Royal HaskoningDHV's experience encompasses projects in several sectors including ports, flood risk, energy generation, transport, aviation and waste. Our collaborative approach means that our staff work outside, as well as within, sectoral silos and across geographic boundaries, ensuring that we identify opportunities or issues of mutual relevance to our clients and share project solutions from other sectors or countries. We firmly believe that working in partnership across sectors and disciplines delivers successful outcomes that cannot be achieved by those working solely within a sector.

We therefore consider that the sectoral and geographic split of the three initial challenges facing the Commission risks limiting the identification of links between these challenges (and others). The National Infrastructure Commission has a 'once in a generation opportunity' to seek to understand the drivers that shape the characteristics of the regions of the UK and how those drivers and characteristics interrelate. Transport and energy should be the facilitators of this grand vision instead of being pushed into the role of drivers of economic growth.

In our view, a National Infrastructure Commission should present the overarching picture of infrastructure assets and needs built from knowledge of connections, synergies, mutual benefits and the need to respect differences. The Commission should avoid starting with the status quo and considering only infrastructure that has already been identified from within the confines of regional, sectoral or administrative boundaries. Existing knowledge and expertise must be used, but a strategic UK Master Plan should be built in partnership from the ground up – not in sectoral isolation and then measures taken to try and join unconnected aspects together.

We call for an Integrated Master Plan delivering a vision for the country; what do we really want the UK to be? It must be more than the sum of the sector silos.

2.0 The Challenge: Large-scale transport infrastructure improvements in London

Royal HaskoningDHV has been involved with the transport planning of many developments in the Greater London Area for more than 40 years. We always take the position that transport should form an integral part of the evolution of a scheme at an early stage and sometimes leads to new standards. The ultimate goal is the delivery of a development that is accessible, sustainable and resilient.

During the last 5 years our involvement with delivering the Cycling Ambitions of the Mayor of London has grown significantly. We are currently part of the Implementation team for London Quietways and Implementing Quietways and involved with sections of the Super Cycle Highway.

We strive to leverage our global experience for the challenges for London. With projects such as North-South Metro in Amsterdam, Netherlands, Decision Support System for the Traffic Management Centre of Beijing, China, the Rail Investment Program for the Amsterdam Metro Area, Netherlands and the Development Plan for the Diraab Corridor in Riyadh, Saudi Arabia.

In responding to this challenge we have identified a number of underpinning themes and principles and also directly answered Questions 1 and 5.

Underpinning themes:

- **Transit Oriented Development** for the entire UK will be key in delivering a sustainable transport system.
- **Focus and prioritise based on a holistic approach to transport**
 - Do we really want to continue and repeat the transport solutions from the Victorian era? While recognizing their contribution, they are in principle almost 150 years old (on average) with the train 185 years, the car 120 years and underground 153 years.
 - The National Infrastructure Commission questions focus to a great extent on the existing solutions. Is that really how we want to plan and develop the UK for the next 30 years? Do we sufficiently understand the questions?
 - We should focus and prioritise investment for the next 10 years on the key capacity bottlenecks in rail, road and ports.
 - Use the first five years for developing a holistic approach to transport for this country including the technology developments in the pipeline, demographic trends and anticipate its wider impact on how we want transport to be.
 - Set minimum restrictions to allow businesses to develop and implement new technology within the framework.
 - Minimum requirements of the transport system in 2030 should be 100% carbon neutral, fast, reliable and at a human scale.
- **Enable innovative solutions**
 - The National Infrastructure Plan is planning for 20 to 30 years going forward (related to lead times and available capital funding). We must plan in an agile way, to ensure easy adaptation of new technologies.
 - Technology tends to have a life cycle of a just a few years on average compared to 50 to 100 years for structures.
 - The original technology should be compatible with the next version and adaptable to future versions.
 - “We should accept that cities are never finished, everything is always in a beta stage” (quote from: Martijn Aslander and Erwin Witteveen in “Nooit Af” (Never finished) 2014)
- **Strive for multi-functional design**
 - Plan a corridor approach to roads, rail, water and power transport thereby combining funding resources (in other words: ‘de-silo’) and reducing redundancy.
 - Integrated solutions provide increased resilience. A good example for this approach is with flood defence. The floods in the North of England in December 2015 caused significant damage and disruption, including impacts on the transport network. It is self-evident that flood risk and climate resilience have to be taken into account in designing improvements to the transport system. However, there is an opportunity to do more: the new infrastructure itself could be designed to help reduce risk to property and people, and for particularly

vulnerable places the investment could even trigger a redesign of the area for a more climate-proof future. We see this type of multifunctional integrated design as an important part of the solution for the UK's flooding crisis, inspired by the Rebuild by Design approach developed in New York after Super Storm Sandy.

Question 1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

Delivery model

We anticipate an increasing tension as a result of the devolution of the surrounding county councils around London. Travellers and goods want seamless journeys and don't recognise administrative boundaries. With the goal of delivering an optimized transport experience we advocate for more power and influence of the Greater London Assembly. This will ensure an integrated approach, keeping projects on their anticipated delivery dates, while at the same time adhering to good governance standards. If this is not feasible, the National Infrastructure Commission should, as the next stage, be transformed into a delivery organisation and agency as part of the Treasury, which will coordinate infrastructure investments.

Housing – what and where?

We must anticipate and plan for changes in the type and location of housing over the next 30 years. What is the real preference of how people would like to live? If that is suburbia (house, garden, and car on the driveway) it is not sustainable (given the increasing population) when considering the demands for all the different type of services (e.g. water, sewage, transport, health care and more).

With the average age increasing, it is likely that more and more people will want to have relatively easy access to a wide range of services from leisure (cinema, museums, parks), to healthcare, to mobility. To deliver that efficiently people will want to move into the city or urbanised centres. At a minimum the government should not support or subsidise further suburban sprawl of London.

In our view London and its satellite cities should densify and develop on Transit Oriented Development principles only. For this reason we strongly support the GLA in her efforts to densify specific areas in the Central Area of the City such as Paddington.

Question 5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

Example: Hong Kong

Hong Kong is an example of a highly integrated city from a transport and planning perspective.

Its key aspects include:

- The Masterplan & Vision are supported by all stakeholders;
- National and city interests are aligned as a result of the governing structure. Planning, funding and operations are close and taken into account with every decision on investment and operations.
- Image of Public Transport: you have a higher status if you live on top of or within close range of a Metro station



Further information

We would be delighted to engage with the Commission to provide further explanation and to participate in the discussion surrounding the challenges.

[contact redacted]

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National Infrastructure Commission (NIC) Response from the RSPB to the Call for Evidence

December 2015

[contact redacted]

SUMMARY

The RSPB welcomes the creation of the National Infrastructure Committee (NIC) and the opportunity that this provides to analyse and assess long-term infrastructure needs in a coordinated and strategic way.

Whilst we accept that '*better infrastructure is vital to improve the needs of British people*¹, it is also vital – in order to achieve truly sustainable development – that this infrastructure is delivered in harmony with nature. Taking this approach would not only help to save nature, it would also provide a wide range of social and economic benefits,

Our recommendations are outlined below:

Green infrastructure

The NIC's remit should include consideration of the UK's strategic, long-term green infrastructure requirements as determined by the Natural Capital Committee. Such consideration must be designed to ensure that NIC recommendations complement, not undermine, the Government's 25 year plan to save the UK's biodiversity.

Taking a spatial approach

The NIC should:

- Recommend the creation – and lead on the development – of a 'light-touch', national spatial framework for the provision of key national infrastructure needs over the next 30 years.
- Undertake strategic environmental assessments of the UK's strategic infrastructure requirements.

Connecting northern cities

The NIC should ensure that its:

- Evidence base includes consideration of environmental impacts, particularly in relation to nature conservation designations of national and international importance.
- Recommendations on future investment priorities would result in no significant

¹ Statement from Chancellor George Osborne, launching the National Infrastructure Commission on 30th October 2015. <https://www.gov.uk/government/news/infrastructure-at-heart-of-spending-review-as-chancellor-launches-national-infrastructure-commission>

adverse effects on nature conservation designations of national and international importance.

London's transport infrastructure

The NIC should recommend that:

- The use of clean, excavated material - resulting from improvements to London's transport infrastructure – in habitat creation / flood risk management schemes should be classed as recovery, rather than waste disposal.
- Habitat creation / flood risk management schemes should be a primary option when considering how to dispose of clean, excavated material resulting from improvements to London's transport infrastructure.
- Infrastructure is provided to facilitate the transportation of excavated material – resulting from improvements to London's transport infrastructure - by train and by boat, including the provision of jetty facilities at coastal or riparian destinations.

Energy

The NIC should recommend that the UK's energy infrastructure needs be met in a way that:

- Reduces greenhouse gas emission by at least 80% from 1990 levels by 2050;
- Delivers a low-carbon energy sector by 2030;
- Maximises the use of renewable energy technologies and minimises reliance on fossil fuels;
- Is delivered in harmony with nature, resulting in no significant adverse effects and, where possible, delivering net-gains for biodiversity.

INTRODUCTION

The RSPB welcomes the creation of the National Infrastructure Committee (NIC) and the opportunity that this provides to analyse and assess long-term infrastructure needs in a coordinated and strategic way.

Whilst we accept that '*better infrastructure is vital to improve the needs of British people*², it is also vital – in order to achieve truly sustainable development – that this infrastructure is delivering in harmony with nature. In particular, this infrastructure should be delivered in a way that:

- avoids adverse effects on our existing environmental assets, particularly those of national and international importance;
- delivers a net gain in biodiversity and contributes to establishing coherent and resilient ecological networks;
- contributes to people's health and wellbeing;
- mitigates – and facilitates adaptation to – the impacts of climate change.

Taking this approach would not only help to save nature, it would also provide a wide range of social and economic benefits (as outlined in the section on Green Infrastructure, below).

² Statement from Chancellor George Osborne, launching the National Infrastructure Commission on 30th October 2015. <https://www.gov.uk/government/news/infrastructure-at-heart-of-spending-review-as-chancellor-launches-national-infrastructure-commission>

In some instances, the natural environment can, itself, provide a cost-effective and sustainable alternative to expensive, 'hard' infrastructure, for example, through the managed realignment of coastal flood defences.

We understand that the Chancellor will consult further on the purpose and structure of the Commission and other matters. Our comments on green infrastructure and taking a spatial approach are relevant to the NIC's remit and therefore this further consultation, but are included here as they are fundamental to our view of the NIC's work and our response to the NIC's three key focus areas.

The NIC's terms of reference - and the questions that it poses in its call for evidence - currently give little emphasis to the principles above or to the related issues outlined below. In our recommendations, we identify how the NIC can potentially address these concerns.

GREEN INFRASTRUCTURE

Infrastructure can be defined as '*the fundamental facilities and systems servicing a country, city or area*'³. In the context of the UK's infrastructure needs, this is normally taken to mean the 'hard' infrastructure of physical structures such as roads, bridges, tunnels, water supply and sewerage systems, electricity grids, etc. However, in its broadest sense, it also encompasses what is commonly referred to as 'green' infrastructure – the network of green spaces and other environmental features that are integral to the health and quality of life of sustainable communities. It is based on the principle that protecting and enhancing nature and natural processes, and the many benefits human society gets from nature, should be consciously integrated into spatial and development planning.

This green infrastructure is central to the future of the economy and people's health and wellbeing. For example, it delivers essential 'ecosystem services' (life-support systems), such as capturing and storing carbon, flood protection and water purification. It enables contact with nature and active recreational use of natural green spaces, which contributes to people's psychological well-being and physical health. As such, it plays a crucial role in addressing the country's health crisis, which is being caused by spiralling levels of physical inactivity, obesity and mental health issues. It is also key in shaping the character and quality of the places in which people live and work. Finally, in many instances, it can actually provide a cost-effective and sustainable alternative to expensive, 'hard' infrastructure projects, for example, through the managed realignment of flood defences. The Natural Capital Committee's third report⁴ makes a very strong economic and social case for the importance of elements of green infrastructure– such as green spaces, parks, green roofs, and sustainable drainage systems – to the future success of the country.

The wide range of benefits provided by green infrastructure makes it clear that it should be at the heart of any analysis and assessment of the UK's long-term infrastructure needs, both in the context of providing 'hard' infrastructure and in its own right.

³ <http://dictionary.reference.com/browse/infrastructure>

⁴ <http://nebula.wsimg.com/272833c20f4e7f67e2799595a7f06088?AccessKeyId=68F83A8E994328D64D3D&disposition=0&alloworigin=1>

25 year plan for nature

The Government has committed in its manifesto and subsequent statements to ‘*develop a 25 year plan to restore the UK’s biodiversity*’. This provides an impetus to deliver green infrastructure at a strategic level, contributing to the Government’s international obligations to restore biodiversity.

In 2013, 25 of the UK’s nature conservation and research organisations came together to produce the *State of Nature* report, setting out the state of our wildlife⁵. The key finding of this report was that 60% of the 3,148 species that were assessed have declined in the last 50 years, and 31% have declined strongly. The follow-up report, *Response for Nature*⁶, sets out 10 key actions that the Government must include as part of its 25-year plan to restore the UK’s biodiversity.

The proposed Response for Nature actions are the responsibility of departments across government. Those of most relevance to the NIC are:

- **Set goals for nature and natural capital** - including a commitment to secure the effective management of a sixth of land for nature by 2020.
- **Defend and implement the laws that conserve nature** - including working to improve the implementation of the Birds and Habitats Directives and supporting the introduction of a low-carbon infrastructure plan.
- **Deliver an ecological network on land and at sea** - including creating a national ecological network and completing a spatial analysis of the ecological network.
- **Improve the connection of people to nature** - including a commitment to improve public health locally, by increasing the extent, quality and accessibility of natural green and blue spaces in all urban and rural settlements.

The NIC is not currently set up to deal with issues of green infrastructure. If our recommendation is pursued, consideration needs to be given to securing the relevant expertise from bodies such as Natural England, the Environment Agency and the NGO sector.

Recommendation:

- The NIC’s remit should include consideration of the UK’s strategic, long-term green infrastructure requirements as determined by the Natural Capital Committee. Such consideration must be designed to ensure that NIC recommendations complement, not undermine, the Government’s 25 year plan to save the UK’s biodiversity.

⁵Burns F, Eaton MA, Gregory RD, et al. (2013) *State of Nature report*. The State of Nature Partnership. https://www.rspb.org.uk/Images/stateofnature_tcm9-345839.pdf

⁶ Response for Nature partnership (2015) *Response for Nature: England*. http://www.rspb.org.uk/Images/responsefornature_england_tcm9-407740.pdf

TAKING A SPATIAL APPROACH

The NIC is charged with offering unbiased analysis of the UK's long-term infrastructure needs and with holding government to account for its delivery. It will also be charged with beginning work on a national infrastructure assessment, looking ahead to requirements for the next 30 years.

The delivery of the UK's long-term infrastructure needs will, to a large extent, be spatial in nature (i.e. particular infrastructure will be delivered in particular locations). As such, strategic spatial planning should play a key role in the NIC's analysis and assessment of these infrastructure needs.

Whilst the local plan process can help to identify specific locations for specific local infrastructure improvements, this level of spatial planning is not sufficient to facilitate the delivery of national infrastructure needs. This will be true even where local authorities take a more co-ordinated approach to infrastructure provision, for example, through the devolution of powers to combined authorities. What is needed is a 'light-touch', national spatial framework showing options and proposals for key infrastructure provision over the next 30 years. This framework should complement related plans and strategies, such as the low carbon infrastructure plan proposed in our response on energy infrastructure (see above).

Strategic environmental assessment (SEA) should play a key role in this spatial planning process. SEA can be a particularly useful tool when considering the range of alternative options for future infrastructure provision, including consideration of different technologies and locations.

Strategic spatial planning and SEAs relating to the improvement of existing infrastructure, such as trans-Pennine transport routes, should be relatively straightforward. However, a more innovative approach will be required for other infrastructure issues such as the provision of a low-carbon energy system. The RSPB is currently developing a spatial framework that will identify how this low-carbon energy system can be delivered in harmony with nature. This has the potential to provide an essential tool for the NIC in developing its own spatial plan. The findings and recommendations of this project will be launched in 2016.

Further advice on spatial planning with nature in mind is provided in the RSPB / RTPi publication, *Planning Naturally*⁷.

Recommendations:

The NIC should:

- recommend the creation – and lead on the development – of a 'light-touch', national spatial framework for the provision of key national infrastructure needs over the next 30 years;
- undertake strategic environmental assessment of the UK's strategic infrastructure requirements.

⁷ RSPB (2013) *Planning Naturally: spatial planning with nature in mind in the UK and beyond*. http://www.rspb.org.uk/Images/planningnaturally_tcm9-349413.pdf

CONNECTING NORTHERN CITIES (Call for Evidence) / FUTURE INVESTMENT IN THE NORTH'S TRANSPORT INFRASTRUCTURE (Terms of Reference)

The RSPB does not seek to comment directly on the questions that have been posed in the NIC's call for evidence on the issue of connecting cities in northern England. However, we would like to comment on the NIC's terms of reference for providing advice to government on future investment priorities to improve connectivity between cities in northern England, particularly across the Pennines.

The NIC's terms of reference state that the NIC must first establish the evidence base and identify the options available. This must include evidence of the potential environmental impacts of the various strategic options for future transport investment. This should be addressed as a crucial issue by the NIC, given that several of the proposed trans-Pennine infrastructure improvements cut across sites of international importance for nature conservation (i.e. Special Protection Areas (SPAs) and Special Areas of Conservation (SACs)). Relevant SPAs / SACs - and the infrastructure proposals which could potentially have a significant effect on these designations - are outlined in Annex 1.

Under the Conservation of Habitats and Species Regulations 2010 ('the Habitats Regulations'), if any of these projects may have a 'likely significant effect' on the SPAs / SACs (either individually or in combination with other plans or projects), it must be made subject to an "appropriate assessment" of its implications for the site in view of the site's conservation objectives. This assessment is commonly referred to as a Habitats Regulations Assessment (HRA). **The projects may only proceed if they will not adversely affect the integrity of the site concerned**, unless the so-called 'derogation tests' apply. These include a test that there are no less-damaging alternatives to achieving the objectives of connectivity.

Recommendations:

The NIC should ensure that its:

- Evidence base includes consideration of environmental impacts, particularly in relation to nature conservation designations of national and international importance.
- Recommendations on future investment priorities would result in no significant adverse effects on nature conservation designations of national and international importance.

LONDON'S TRANSPORT INFRASTRUCTURE (Call for Evidence / Terms of Reference)

The RSPB's main interest in the issue of London's transport infrastructure is the use of excavated material deriving from improvements to this infrastructure. Our comments relate to Question 3 and 4 posed by the NIC in its Call for Evidence⁸ and to the NIC's terms of reference on this issue.

Improvements to London's transport infrastructure result in the production millions of tonnes of excavated material that needs to be disposed of each year. Not only is this disposal

⁸ Question 3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?; Question 4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

potentially hugely expensive, but the transportation of this material also provides a significant challenge.

The Wallasea Island Wild Coast project provides an excellent example of how the benefits of such infrastructure improvements can be greatly increased and the costs significantly reduced. In this project, three million tonnes of excavated material from London's Crossrail project has been used to help create 670ha of new, tidal, wetland habitat. See Annex 2 for further details of this project.

One of the key factors that made the use of Crossrail's excavated material financially viable was that the Environment Agency classed this use as 'recovery' – as defined in Article 3(15) of the Waste Framework Directive (Directive 2008/98/EC on waste) - rather than 'waste disposal'. As such, the use of this material is subject to a much less stringent – and, therefore, much cheaper – regulatory regime than would be required for a waste disposal operation. The 'recovery' classification has also resulted in savings of approximately £200 million because landfill tax has not had to be paid for the disposal of this material.

However, the Environment Agency's decision to class the use of this material as 'recovery' has been somewhat controversial. For example, in a recent Court of Appeal case, the Environment Agency's legal representative *'argued that the EA [Environment Agency] itself had erred in law in granting a standard rules environmental permit (i.e. a recovery operations permit) in respect of the use of Crossrail waste spoil for the creation of a nature reserve in the Wallasea decision.'*⁹

Given the issues raised about Wallasea in the Court of Appeal case, it is by no means certain that a recovery permit will be granted for the use of excavated material at Wallasea, or for similar projects, in the future. If the use of this material is classed as 'waste disposal', it could jeopardise the completion of the Wallasea project (which still requires an additional seven million tonnes of material) and the delivery of similar habitat creation / flood risk management projects in the future. Last, but not least, it would also add hundreds of millions of pounds to the cost of improving London's transport infrastructure.

Recommendations:

The NIC should recommend that:

- The use of clean, excavated material - resulting from improvements to London's transport infrastructure – in habitat creation / flood risk management schemes should be classed as recovery, rather than waste disposal.
- Habitat creation / flood risk management schemes should be a primary option when considering how to dispose of clean, excavated material resulting from improvements to London's transport infrastructure.
- Infrastructure is provided to facilitate the transportation of excavated material – resulting from improvements to London's transport infrastructure - by train and by boat, including the provision of jetty facilities at coastal or riparian destinations.

⁹ Tarmac Aggregates Ltd, R (on the application of) v The Secretary of State for Environment, Food and Rural Affairs & Anor [2015] EWCA Civ 1149 <http://www.bailii.org/ew/cases/EWCA/Civ/2015/1149.html>

ELECTICITY INTERCONNECTION AND STORAGE (Call for Evidence) / DELIVERING FUTURE-PROOF ENERGY INFRASTRUCTURE (Terms of Reference)

The RSPB's main areas of concern relate to the NIC's Terms of Reference, rather than the questions posed in the Call for Evidence. In particular, we are concerned about the lack of any reference to (i) the Government's legally binding targets to reduce greenhouse gas emissions or (ii) the Climate Change Committee's recommendation to achieve a low carbon energy system (including a low carbon electricity network) by 2030.

Potential impacts of climate change

Climate change is the greatest single long-term threat to nature and to people, with one in six species at risk of extinction by 2100 if the temperature changes modelled by the Intergovernmental Panel on Climate Change (IPCC) come to pass¹⁰.

The RSPB recently published a new report on the impacts that climate change is already having on wildlife¹¹. For example, the 70% decline in UK kittiwake populations since the 1980s has been linked to climate change. Over the course of this century, impacts will only intensify and increase, particularly if action is not taken to limit climate change.

To avert these risks — and to enjoy the economic and social benefits of a healthy, natural environment — will require a transition to a low-carbon economy that takes place in harmony with nature.

Climate change targets

The UK marked itself out as a world leader in tackling climate change through the introduction of the Climate Change Act in 2008. It became one of the first countries in the world to set legally binding domestic climate change targets and, since then, many other countries have followed suit. These climate change targets set the UK on a trajectory to reduce its economy-wide greenhouse gas emissions by at least 80% from 1990 levels by 2050.

In order to keep on track for this 80% reduction, the Government's independent advisory body, the Committee on Climate Change (CCC) recommends that the UK needs to have reduced its emissions by 37% relative to 1990 levels by 2030. In order to achieve this, the UK needs a low carbon power sector that produces no more than 100 gCO₂/kWh. At present, our energy system has a 'carbon intensity' of around 450 gCO₂/kWh.

The CCC has said that while the UK is on track to meet its third carbon budget, there is concern about longer term progress. In order to meet the fourth carbon budget, 'significant action' will be required during this Parliament in order to keep the UK on track.¹²

An additional factor to be considered is the new evidence, published in the journal *Nature*, which has shown that, globally, the majority of fossil fuels will need to stay in the ground, if we are to achieve the global aspiration to keep temperature rises below two degrees¹³.

¹⁰ <https://www.sciencemag.org/content/348/6234/571.full>

¹¹ <http://www.rspb.org.uk/natureclimate>

¹² https://www.theccc.org.uk/wp-content/uploads/2015/06/6.737_CCC-BOOK_WEB_030715_RFS.pdf

¹³ <http://www.nature.com/nature/journal/v517/n7533/abs/nature14016.html> [Globally, a third of oil reserves, half of gas reserves and over 80 per cent of current coal reserves should remain unused from 2010 to 2050 in order to meet the target of 2 °C]

Transition to a low carbon energy system

The UK's energy infrastructure has shifted towards a lower-carbon energy system in recent years, including increased levels of renewable energy and the proposed phasing out of unabated coal. However, recent cuts to support for energy efficiency measures, solar, onshore wind and carbon capture and storage (CSS) technology, as well as an ongoing enthusiasm for developing new gas infrastructure, including fracking, could all jeopardise the UK's trajectory to a low-carbon future.

It is critical that the UK Government sets out new support for the renewable and energy efficiency sector in order to drive investment in the infrastructure we will need over the coming years and decades to achieve this low-carbon future. With the costs of established renewable energy technologies in the UK (onshore and offshore wind, solar) falling all the time¹⁴¹⁵, we believe that renewable technologies, coupled with demand reduction and energy efficiency measures, are likely to meet our energy needs at costs similar to - or cheaper than a - higher-carbon pathway.

Delivering energy infrastructure in harmony with nature

The RSPB strongly supports the appropriate siting of all infrastructure, such that it avoids adverse impacts on the natural environment. The RSPB is currently reviewing evidence and modelling potential impacts of different levels of deployment of a range of energy technologies. We will be publishing our findings and our recommendations on how to deliver energy infrastructure in harmony with nature in 2016.

Recommendations:

The NIC should recommend that the UK's energy infrastructure needs be met in a way that:

- (i) reduces greenhouse gas emission by at least 80% from 1990 levels by 2050;
- (ii) delivers a low-carbon energy sector by 2030;
- (iii) maximises the use of renewable energy technologies and minimises reliance on fossil fuels;
- (iv) is delivered in harmony with nature, resulting in no significant adverse effects and, where possible, delivering net gains for biodiversity.

¹⁴ <http://energydesk.greenpeace.org/2015/09/21/4-ways-the-uk-can-get-almost-all-its-power-from-renewables/>

¹⁵ <http://about.bnef.com/press-releases/wind-solar-boost-cost-competitiveness-versus-fossil-fuels/>

ANNEX 1. TRANS-PENNINE INFRASTRUCTURE PROPOSALS & INTERNATIONAL NATURE CONSERVATION DESIGNATIONS

The designations of most relevance to the proposed trans-Pennine infrastructure improvements are the Peak District Moors (South Pennine Moors Phase 1) SPA / South Pennine Moors SAC and the North Pennine Moors SPA / SAC. Key habitats in these designations include European dry heath and blanket bog, which provide a wide range of ecosystem services, including carbon sequestration. Key bird species include golden plover (*Pluvialis apricaria*) and merlin (*Falco columbarius*).

The Trans-Pennine infrastructure proposals which could have an effect on these designations are outlined below:

- (i) Improvements to the A628 (Manchester - Barnsley road): About 5km of the A628 road is straddled by the Peak District Moors (South Pennine Moors Phase 1) SPA / South Pennine Moors SAC, with an extra 1.5km where the SPA / SAC is on the south side only (i.e. 6.5km in total).
- (ii) Viability study for a Trans-Pennine road tunnel between Manchester and Sheffield: The Woodhead Tunnel would use an old (double) railway tunnel underneath the Peak District Moors (South Pennine Moors Phase 1) SPA / South Pennine Moors SAC, so would negate the need for the passing lane on the A628 for the 6.5km of SPA / SAC mentioned in (i) above.
- (iii) Improvements to the A57 between Manchester and Sheffield: About 5km of the Peak District Moors (South Pennine Moors Phase 1) SPA / South Pennine Moors SAC straddle the A57 on both sides.
- (iv) Viability study for dualling of the A66 (Penrith - Darlington road) and A69 (Carlisle - Newcastle Road): About 1km of the A66 is straddled by the North Pennine Moors SPA / SAC, with an extra 5km where the SPA / SAC is on the north side only (i.e. 6km in total).

ANNEX 2. Wallasea Island Wild Coast Project

Wallasea Island Wild Coast Project is a unique partnership between the RSPB and Crossrail which brings together Europe's largest civil engineering project and Europe's largest intertidal habitat creation project. The project demonstrates how major infrastructure schemes can help to enhance nature and 'future proof' low lying coasts against sea level rise caused by climate change as well as generating economic growth.

The project will transform 670ha of levee-protected farmland – an area twice the size of the City of London - back to a wetland landscape of mudflats and saltmarsh, lagoons and pasture. It will help to compensate for the loss of such tidal habitats on internationally important sites elsewhere. Once the project is completed, Wallasea Island, which lies 8 miles north of Southend-on-Sea in Essex, will provide a haven for a wonderful array of nationally and internationally important wildlife and an amazing place for the local community, and those from further afield, to come and enjoy.

The challenges that the Wallasea project seeks to address are real and pressing. Four hundred years ago, the Essex coast was a wild and stunning place, a haven for wildlife – including 30,000ha of intertidal saltmarsh - and a source of livelihood for local communities. Sadly, today, less than one tenth (2,500ha) of this wild coast remains due to land claim for agriculture and accelerating coastal erosion. Across England, saltmarshes and mudflats are continuing to decline at a rate of 100 hectares a year. This rate of loss will accelerate with climate change as rising sea levels and more storminess steadily erode the precious transition zone between land and sea.

With much of the island lying 2-3 metres below sea level at high tide, it has become uneconomic to protect Wallasea with traditional, hard engineering flood defences (i.e. sea walls). The project demonstrates a more sustainable approach to flood risk management, using managed realignment. Current flood defences will be breached, allowing flood water to be let into the island in a controlled way in the event of a tidal surge. This will reduce the risk of an unmanaged breach and associated negative impacts, including disruption to navigation, erosion of adjacent sea defences and loss of built assets on Wallasea. The project will also help to mitigate the impacts of climate change by sequestering approximately 4 tonnes of carbon dioxide per hectare (i.e. over 2,000 tonnes across the whole site) per year.

The project requires the importation of 10 million tonnes of soil. 3 millions tonnes of this has been provided from the £14.8 billion Crossrail project, using excavated material from the 42km of Crossrail tunnels that have been dug under London. This represents half of the total amount of excavated material – 6 million tonnes (enough to fill Wembley Stadium three times over) – that has been produced by the Crossrail project. 80% of the excavated material has been transported by rail and boat, removing 150,000 lorries (and their associated health, safety and environmental risks) off the streets of London. The RSPB is currently seeking partners to provide the remaining 7 million tonnes that it requires to complete the project.

Planning permission was granted in 2009 and the first phase of the project - Jubilee Marsh - was completed in July 2015. The project is due to be completed by 2020, and will cost about £50m in total.

National Infrastructure Commission

RTPI Evidence on Transport in London

8 January 2016

Introduction

The Royal Town Planning Institute (RTPI) has over 23,000 members who work in the public, private, voluntary and education sectors. It is a charity whose purpose is to develop the art and science of town planning for the benefit of the public. The RTPI develops and shapes policy affecting the built environment, works to raise professional standards and supports members through continuous education, practice advice, training and development.

Consultation Questions and Answers

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

Governance

A key challenge is how London and the rest of the South East are governed together in a joined-up manner. It can be helpful to consider the rest of the South East in two zones. The South East Study 1964 identified the **Outer Metropolitan Area (OMA)** (roughly equivalent to the Metropolitan Green Belt plus the (substantial) towns within it, and the **Outer South East (OSE)**. These definitions seem to hold today, and certainly avoid the political and public relations difficulty of referring to the “commuter hinterland” of London (which in any case is a partly misleading term as there are many jobs in the OMA itself). The key questions around transport infrastructure probably apply to the OMA.

Various attempts have been made to address the governance question and none have been totally satisfactory. It is interesting that in northern cities the Government has insisted on joint working across a travel to work area, but due to the existing Mayoral arrangements for London inside the M25, there has been no similar requirement of London.

The creation of the Mayoralty led in the first two terms to a fairly limited discourse between the Mayor and the counties round about. Under the Labour government three different regional plans were pursued for the London and OMA. The debates around the latest

alteration to the London Plan have begun to cause a more extensive debate, but still one very much choreographed by the Greater London Authority, rather than on a broader and more neutral platform.

The RTPI has argued for both much stronger but voluntary cooperation on strategic planning between the planning authorities *within* the counties of the OMA but also for cooperation between neighbouring strategic planning areas. In this context this would be between the GLA and the surrounding counties. In our view these must take place within a context of incentives. This can operate such that counties are incentivised to take additional housing in return for public spending on issues which are important to them, such as schools, health care facilities and transport investment. Imposing London overspill on surrounding areas has not in the past proved successful and is politically unwise.

Fragmentation of decision making

Fragmentation is not only a challenge across the geography of the London region, but especially seriously across sectors. One difficulty with the proper planning of housing and transport in the wider London region has been the disconnection between decisions on fares, decisions on train operation and decisions on land use. An example is the situation at Ashford where the international operation of the station has been reduced despite its significance as a growth point.

Social balance

Various factors are putting the continued social balance of London seriously at risk. These are high prices for private homes, high private sector rents, very low levels of social housing construction, loss of high value council houses (proposed), bedroom tax, and estate “regeneration” (where leaseholders in particular run the risk of not being able to buy back into their estate).

As a solution to housing shortage some commentators have proposed that homes should be built in the OMA and/or in the part of the Metropolitan Green Belt within the M25. This would only be of value to low income Londoners priced out of inner London if both fast times, sufficient capacity and, critically, *affordable fares* are guaranteed. Conventionally, the stock broker belt is so called for a reason : only higher paid staff could afford the travel and had the option of sociable working hours. Far flung destinations are only conceivable solutions for low income housing if travel is timely and above all cheap.

Air quality and Carbon reduction

London’s air pollution is breaching European safety limits and road traffic levels remain too high. The next Mayor should take a proactive approach to tackling this problem, which recognises the potential to achieve major public health and productivity gains through low-carbon transport measures. These should include advancing the implementation of the Ultra Low Emissions Zone and extending the Congestion Charging Zones to restrict the number of polluting vehicles on the roads, complemented with a new fleet of electric buses and taxis, a

city-wide network of electric vehicle charging stations, and by doubling the number of safe, integrated cycle routes by 2030.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to, Crossrail 2?

The choice of locations for large scale infrastructure should be informed by where it can unlock substantial housing investment. This would include the Barking Riverside area where commitments have been made.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

We would repeat our comments above that it is essential to relate the scheme as closely as possible to additional housing development. Crossrail 1 and the northern line extension have been funded on the principle that its only business landowners who should pay for infrastructure through higher tax revenues. While the principle of taxing increased land values is sensible, It is our view that the owners of land for business and the owners of housing land should both be liable for tax contributions to cross rail 2.

However, a balance must be struck from using the enabling development solely to raise as much money as possible, and other priorities from the use of land, such as meeting London's housing need in the round – and also *the housing needs* . Too often using public land for the narrowly profitable purposes

[Contact redacted]

Royal Town Planning Institute
The RTPI is a charity registered in England (262865) and Scotland (SC 037841)

Siemens response to National Infrastructure Commission call for evidence - Large-scale transport infrastructure improvements in London

Introduction

This document forms part of Siemens' response to the consultation published by the National Infrastructure Commission. The response relates to the third part of the call for evidence: **London's transport infrastructure**.

Siemens in the UK employs almost 14,000 people across the UK with 13 manufacturing sites and multiple other facilities.

London and the wider South East are an important market for our various businesses, where we employ around 2000 people. Siemens manufactures and maintains the highly reliable mainline trains operated by South West Trains, Heathrow Express, Greater Anglia and London Midland among others, transporting passenger in safety and comfort in and around the capital. From 2016 Siemens will introduce the state-of-the-art Class 700 fleet to the UK. These new trains will provide a much improved passenger experience on the Thameslink route and help to create 2,000 jobs across the UK supply chain.

Siemens has been involved in the signalling of London Stations for over 150 years. We resignalled the Victoria line in time for the 2012 Olympic and Paralympic Games and are working with London Underground on continuous improvements. We are now resignalling the Thameslink route, and supplying Crossrail with signalling, train supervision, station and line management and train control.

Elsewhere, using the latest electric traction drive technology from Siemens, London's new Routemaster buses are up to 40% more fuel efficient than diesel buses with a 47% reduction in CO₂ and a 78% in NO_x (nitrogen dioxide). Siemens' detection and enforcement system architecture is helping London to reduce traffic levels, congestion and pollution as part of the London-wide Congestion Charge and Low Emission Zone.

Siemens also supports London's energy and safety needs. Siemens fire safety technology protects 84% of buildings and safeguards 90,000 people at Canary Wharf. In Bexley, Siemens provides 24/7 CCTV services, helping transform the area into London's safest borough.

Finally, Siemens invested £30 million in The Crystal at Royal Victoria Dock. As one of the World's most sustainable buildings and home to the World's largest exhibition on urban sustainability, the facility also houses our city experts who are working on making city infrastructure around the world cleaner and more efficient.

We are therefore responding to this call for evidence as both a business user and major supplier of infrastructure technology and services in London and, indeed, elsewhere. We have responded in broad terms to specific questions on strategic priorities for London's transport infrastructure. We have also contributed to the CBI's industry wide response to this call for evidence. However, technical innovation often plays a major role in determining the right transport solution to a particular project or problem, whether that is over-capacity on the railways or congestion on the roads. As such, our evidence sets out what we see as the major challenges facing London's transport infrastructure and some of the technologies, which we as suppliers believe could address these. We also outline potential delivery challenges.

Response to Questions:

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

The economic and social challenges facing London are well known. It is a city on the move, which is predicted to grow from 8.6 million in 2015 to over 11 million by 2050. Such development is a testament to London's ongoing success, but it creates pressure on public services, increases demand for housing and exacerbates environmental challenges faced by the city, such as poor air quality. Investments in transport connectivity and technology can play a significant role in addressing these challenges by making existing areas more attractive to live in, opening up new areas to development and helping to reduce energy consumption and air pollution.

As London continues to grow the primary and overarching challenge for London's transport system is one of capacity. The strain on the capital's transport arteries is considerable and will only increase. Whilst there are a range of short term options that can be considered, such as better access to platforms through increased provision of lifts or escalators, these measures will only help with the existing volume of passengers and are not sufficient to cope with continued growth.

In addition when it comes to rail/metro provision, there are some notable black spots within the capital. For example, when travelling between areas south of the river - by tube or train - passengers often have to go into central London and then back out again.

Large scale projects such as Crossrail 1 and the Thameslink upgrade will help reduce capacity issues but we need more of these types of projects. Moreover when it comes to the Tube network, we are coming to the point where changes to the existing infrastructure are not having the impact needed and whole scale re-developments will be needed to provide for continued growth in passenger numbers. There has also been a marked increase in the risks related to operating a world-class transport system both in terms of cyber and the physical threat from terrorists. These are threats that will need to be considered as we continue to upgrade and develop the network.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

2.1. Making the right choice at the outset: Technological Innovation and Financing

As a business user, and to address the capacity crunch outlined above, we are supportive of projects such as Crossrail 2 that will help to alleviate congestion on busy routes into central London. We also

believe that river crossings, particularly in the east of London, are key to unlocking London's future development potential and meeting the target of 50,000+ new homes per annum.

However as a supplier and finance provider towards infrastructure projects we would also make a broader point about the importance of making the right choice about technology and finance solutions to infrastructure problems at an early stage.

Technical innovation can play a major role in determining the right transport solution for a particular project or problem. Whether it be in the latest technologies for rail signaling and train control to improve capacity and performance, or smart technologies which can optimise road space, prevent congestion before it occurs, and manage parking systems in cities and towns to maximise parking availability, it is increasingly the case that technology can play a major role in determining which transport solution might be the most appropriate for a given set of circumstances or objectives.

Having overall control of the London Transport network, TfL has the unique opportunity to introduce a smart ticketing system to encompass an integrated travel information system which would encourage travellers to move between various modes of transport dependent upon demand, capacity, weather conditions etc.

More efficient use of road and rail capacity through the use of smart technology can itself be a transport solution, perhaps in certain circumstances even avoiding the need to build brand new capacity altogether. Technology can therefore also drive down costs and drive up efficiency not just for individual capital projects, but for the wider management of transport systems.

It is therefore increasingly important that technical considerations are taken into account at the earliest stages of a project development to ensure that the right solution to a particular problem or wider transport objective is developed from the outset. Technology should not be an issue that is left to be addressed once a particular transport solution has been decided upon.

Similarly when considering financing of large and complex projects a full analysis should be undertaken of all the options at the outset. While Public Private Partnerships (PPPs) often come in for criticism we consider such structures to be highly beneficial under the right circumstances in the transferring of risk from the public sector to those best able to manage and control them.

It was noted that on the Crossrail Rolling Stock Project the funding route changed from a PPP to public funding towards the end of the bidding phase. Such changes at the end of procurement and once a full submission by all the bidders required further rounds of bidding. This is inefficient and adds cost and time for both the procurement authority and the bidders.

That said, International Finance Institutions such as the European Investment Bank (EIB) provide funds to both the Public and Private Sector and we encourage full use of their facilities. EIB provides long term debt on advantageous terms and Siemens uses EIB worldwide. We are aware of TfL's use of EIB in financing its projects.

2.2. Technological solutions

Rolling stock and Refurbishment

New rolling stock can dramatically improve the experience of commuters while also helping to alleviate capacity issues across the network. Siemens' new fleet of Class 700 trains, which will run on the Thameslink line from spring 2016, will provide 80% more peak seats across central London from

2018. The New Tube for London would also provide a similar step change in terms of capacity right across the Piccadilly, Central, Waterloo & City and Bakerloo lines.

Refurbishment programmes, such as that for the 1995 (Northern) and 1996 (Jubilee) stock, can only go so far in solving the capacity problem. As a world city, passengers expect high standards from London's transport system. Refurbishment does not always provide the step-change that most people expect but can go some way to helping to bridge the gap whilst the larger scale projects are in development. However, even after further upgrade to the Tube there is still likely to be a saturation point when we reach a maximum potential capacity. As a result, rolling stock is only part of the solution. There needs to be a fully joined up approach with signalling in the capital to push the performance of trains

Signalling

Delivering increases in the number of trains per hour should also be a priority. State of the art signalling and modern trains are key to achieving this. While the Victoria line is currently operating at up to 34 trains per hour the goal is to further increase the frequency for this line together with other tube lines by both optimising the current technology and introducing new state of the art signalling technology.

Traffic

Without further measures to reduce or redistribute demand (e.g. extend the Congestion Charging area), road traffic is forecast to increase over the next decade and beyond. To help mitigate the effects of this increase, TfL is already extending the use of SCOOT throughout London. SCOOT (Split Cycle Offset Optimised Technique) is an algorithm, originally developed by the Transport Research Laboratory, and adopted by TfL which adapts traffic signal timings automatically according to current traffic conditions.

All of the traffic signal junctions in London are connected to a central Urban Traffic Control (UTC) computer system which runs SCOOT on those junctions equipped for it. For those junctions not equipped with SCOOT, the traffic control plans are mainly fixed and are not automatically adaptable. It therefore makes sense to extend SCOOT control to most, if not all of London's signalised junctions.

SCOOT also gives TfL the capability to change priority for certain road users; for example SCOOT can run a plan optimised for cyclists, or for pedestrians or for road traffic travelling on certain arteries such as the North Circular.

The second option to alleviate future road traffic congestion is SITS: SITS stands for Surface Intelligent Transport System. SITS will bring in advanced methods for collecting data on the state of London's road traffic, including cyclist. These methods currently include sensors in the road for road based traffic, above ground sensors for people and road traffic and use of Automatic Number Plate Recognition (ANPR) cameras for collection journey time information. Extensions to these sources will include Bluetooth data, GPS data, Mobile Phone data and many other data sources yet to be developed. These extra data sources will improve the "eyes and ears" of SITS to make more intelligent decisions based on current conditions. TfL will also deploy predictive modelling techniques using and combination of a "model of London" and simulation to predict the future state of congestion given a set of initial conditions. This will help TfL to get more capacity out of the existing road network and will also assist with a more rapid response to planned or unplanned

events. TfL will also be able to forecast the effect of roadworks on the immediate and surrounding areas and to simulate the effects of remedial actions.

Hybrid, Electric and Hydrogen vehicles

In addition to taking steps to tackle traffic, more can be done to accelerate the roll-out of hybrid, electric and hydrogen vehicles, including buses. These can play a major role in ensuring that London keeps moving and air quality is improved.

Modern urban transport networks have been developed over several decades based upon the availability and operational characteristics of diesel fuelled transit buses. Currently there are more than 8,000 diesel buses operating in London and while many of these vehicles use reduced emission hybrid technology, significant levels of harmful pollutants are still emitted as diesel remains the primary fuel source. However advances in battery and propulsion technology over the past five years have made zero emission transit buses a reality in many global cities, including London. Nonetheless many obstacles remain, preventing this new technology to evolve and mature from pilot phase into scalable real world applications. To overcome some of these challenges and support sustainable deployment of zero emission buses, Siemens has developed a number of electric fuelling solutions. Already deployed in Europe and North America, automated opportunity charging systems, intelligently networked to the distribution grid, permit wide scale roll out of electric buses within existing transit operations.

London already has some small fleets of fully electric vehicles in service and has been operating Hydrogen Fuel Cell vehicles zero emission buses on route RV1 between Covent Garden and Tower Gateway since 2011. There are eight buses in operation which means it is the first time a whole route has been fully operated by hydrogen powered buses in the UK.

2.3. Deliverability

The terms of reference accompanying this call for evidence also seek views on the deliverability of strategic transport priorities. As major suppliers, we would highlight the following general issues which need to be considered in relation to potential rail upgrades:

Challenges for TfL

Transport for London (TfL) has performed well in a number of recent passenger surveys, with satisfaction across the Underground at an all-time high between December 2014 and March 2015. However they face the challenge of having to continue to build on these numbers whilst facing budget cuts. This is clearly not an issue within the remit of the NIC, but it is important consideration nonetheless.

Project Delivery

With a significant amount of investment planned for London's transport network the coming years we will see a number of large scale projects being carried out at once. Whilst there is likely to be some disruption, we need to ensure that every measure necessary is taken to minimise the impact on the day to day lives of Londoners and commuters. This can only be done with excellent planning and co-ordination between all parties involved in the upgrade. We can, where possible, also try to keep existing systems going until the new ones are in place and ready to use. For example, when re-signalling the Victoria Line, Siemens kept the existing system running while they were implementing the changes, ensuring the transition ran as smoothly as possible

Skills

Over the next 10 years, 3,300 new workers are needed for to help meet the UK's Traction & Rolling Stock (T&RS) needs alone. This represents a serious challenge for the future of London's rail network.

This skills shortage is why Siemens has established the National Training Academy for Rail (NTAR) in Northampton, which will provide 20,000 man days of training per year. NTAR has enabled SMEs to access best in class training for rolling stock maintenance. By taking leadership in important areas such as these, larger players can open the door to market access for those companies that sit within their supply chain. One of the great benefits of NTAR is its links to other academies across the country, which all seek to complement each other. For example, National College for High Speed in Birmingham and Doncaster will have a different remit from that of the site in Northampton.

It is important that industry continues to invest in skills, but we need to do so in partnership with government at all levels and with the knowledge that there is a pipeline of work in order to sustain the rail sector and retain skilled employees.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Maximising industrial opportunities

As outlined above industry need certainty and a long-term investment and planning horizon if it is to invest in skills and innovation to drive down costs. The creation of the NIC is a welcome move in this regard if it leads to longer-term certainty in the UK's infrastructure investment. As widely recognised the rail sector in particular has suffered from the on/off approach to public spending which has often been adopted in the UK. Developing Crossrail 2 and other similar major transport projects not just in London, but elsewhere in the country, will help the UK to maximise opportunities in the associated supply chain and services sector.

Stakeholder engagement

The high level of stakeholder engagement already witnessed on the Crossrail 2 scheme is to be welcomed. Consultation with stakeholders and the public is also absolutely crucial when planning and delivering large scale rolling stock improvements in the capital. The Class 700 benefitted from feedback from UK train operators, train crew, cleaners and maintenance staff, as well as dedicated passenger research. Any future rolling stock project from Crossrail 2 would benefit from a similar programme.

Predictive maintenance

Siemens has led the rolling stock industry in terms of predictive maintenance. Our new depot at Three Bridges – part of a €400million investment – is leading the way in this area. By catching a fault early, a more considerable cost associated with a full replacement can be avoided. It also reduces the likelihood that passengers' journeys will be affected. Siemens' new facility at Three Bridges has an automatic inspection facility which uses laser measurement to accurately predict when key train components need to be maintained or replaced.

Aligned incentives

Crossrail 2 would benefit from the introduction of performance based contracts, whereby suppliers and manufacturers are incentivised for their performance. This works to encourage and drive

excellence while ensuring the Government receives good value for money after the main procurement process has been completed.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

Raising finance

Raising finance is a crucial part of some procurement processes, however we realise that it is not always possible to do this quickly. The contracts for the Intercity Express Programme and Thameslink were awarded more than two and a half years later than intended, partly due to issues with securing funds during the financial crisis.

As the UK's economy recovers the challenge is to continue to attract investors seeking a stable return, such as pension funds. They will be won over more easily if the right contractual structures are in place, these need to be transparent with an emphasis on the benefits of entering into the agreement.

In terms of alternative financing models we note and support the success of the Crossrail Business Rate Supplement which financed £4.1 billion of the costs of the £14.5 billion Crossrail project. Worth 2p for business properties with a rateable value of more than £50,000. Smaller firms around the new line's stations were required to pay as they will benefit most. We are supportive of a more general use of the Business Rate Supplement provided it is, as now, capped and subject to approval by local stakeholders.

Green Bonds

The Climate Bond Initiative estimates the Climate-Aligned Bonds market, which includes labelled green bonds and unlabeled climate-aligned bonds, to be \$598 Billion in 2015. The majority fund transport solutions (around 72 percent) and energy (15 percent). Unlabeled green bonds are an important source of finance for projects that have an impact on reducing GHG emissions, for example a new railway.

In June 2014, Johannesburg successfully issued a green bond, becoming the first C40 city to do so. The bond, with a value of US\$143m, was 1.5 times oversubscribed and will finance a wide range of green infrastructure projects across the energy, water, waste and transport sectors. In Washington DC, the District of Columbia Water and Sewer Authority (DC Water) has issued a \$350 million 100 year green bond. The bond is helping to finance a portion of the DC Clean Rivers Project, a \$2.6 billion project to construct tunnels that will transport combined sewer overflows, to DC Water's Blue Plains Advanced Wastewater Treatment Facility. The project serves several "green" purposes including improving water quality for the District, flood mitigation and waterfront restoration

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

Decision-makers in London should be able to draw on ideas and experiences in other cities and countries to ensure that we develop the best transport system possible. Drawing on Siemens' extensive experience in other contexts, some solutions adopted in other countries are outlined below.

Protecting the environment

One of the central challenges for London is ensuring growth is sustainable, mitigating as much as possible potential impacts on the environment. This can be done by ensuring that all new rolling stock are designed for the future, meaning that they are based on the latest technology that allows them to be energy efficient for the duration of their life span.

The **C2 metro train for Munich Underground**, unveiled by Siemens towards the beginning of 2014, sets new standards in energy efficiency. Forming part of an eventual fleet consisting of 126 new metro cars, the train is:

- Up to 97 percent recyclable
- Energy-efficient, thanks to the recovery of up to 50 percent of the braking energy
- Has LED lighting throughout

Hybrid buses powered by Siemens in Swedish cities

Volvo's new electric ZeEUS12m plug-in hybrid bus with Siemens fast-charging technology have started running in Stockholm after having been tested in Gothenburg over a period of three years. The tests have shown that plug-in hybrid buses reduce fuel consumption by more than eighty per cent and the total energy demand by more than sixty per cent.

Siemens' Velaro family of high speed trains operate worldwide including on HS1 in the UK and routes in Germany, Russia, China and Turkey. The train has been modified for a number of different conditions but has energy efficiency right at its heart, this includes features such as:

- Aerodynamic optimization on the roof section reduces sonic boom in tunnels. This includes fully encased roof-mounted equipment and an aerodynamically refined spoiler, nose, and front section
- Surplus braking energy which is fed back into the power grid
- Both of these features reduce energy consumption and CO2 emissions. The overall result is equivalent to a gasoline consumption of 0.33 litres per seat and 100 kilometres

eHighway to reduce CO2 and nitrogen oxides

Siemens is currently trialling our eHighway system in Los Angeles and Gothenburg. This allows road freight transport to be powered by electricity, combining the efficiency of the railroad with the flexibility of trucks into an innovative freight traffic solution that is efficient, economical, and environmentally friendly. The system makes it possible to reduce the use of fossil fuels and truck operating costs, at the same time eliminating local emissions such as CO2 and nitrogen oxides. Almost 90% of freight in the London area is carried on the roads and thus a significant contributor to congestion and pollution and the amount of freight is increasing due to the "Amazon effect". The use of electric vehicles for freight including last-mile (or "last two-kilometres") logistics would help to alleviate the pollution caused.

Reliability

The levels of reliability required by TfL are significant. Suppliers of a range of products need constantly to innovate and develop new technologies.

As with any Siemens train, the C2 Metro train for Munich Underground is manufactured and maintained to exacting standards. Cutting edge, highly reliable technology means increased time between maintenance, increasing availability to the operator.

In Spain the Velaro train operates the busy Barcelona to Madrid high speed route where it travels well over 500,000 kilometres a year with punctuality exceeding 99%.

Integrated transport

As London's rail network continues to grow the challenge is to ensure integration between various modes of transport. Siemens is undertaking work with the German Federal Ministry of Economics and Technology to integrate further different transportation providers. A key part of this is a B2B IT platform which provides access to information (e.g. for route planning) and transactions (for bookings and reservations). Integrating 'mobility partners' such as bus, taxi, (e-)car sharing, bike-sharing, parking has a number of benefits including:

- Environmental – e.g. by reducing traffic congestion or time spent searching for car parking spaces
- Financial – studies show that such a service can generate additional revenue for transport providers

Procurement should include state of the art multi-point solutions for city infrastructure and promote innovation which is critical for UK infrastructure. Such improvements can also be justified in terms of productivity.

Further information and follow-up:

We would welcome the opportunity to meet the NIC team to further explore the topics listed above. For this or any questions arising from this response contact:

[contact redacted]

Siemens plc, 8 January 2016

About Siemens

Siemens AG (Berlin and Munich) is a global technology powerhouse that has stood for engineering excellence, innovation, quality, reliability and internationality for more than 165 years. The company is active in more than 200 countries, focusing on the areas of electrification, automation and digitalization. One of the world's largest producers of energy-efficient, resource-saving technologies, Siemens is No. 1 in offshore wind turbine construction, a leading supplier of combined cycle turbines for power generation, a major provider of power transmission solutions and a pioneer in infrastructure solutions as well as automation, drive and software solutions for industry. The company is also a leading provider of medical imaging equipment – such as computed tomography and magnetic resonance imaging systems – and a leader in laboratory diagnostics as well as clinical IT.

In fiscal 2014, which ended on September 30, 2014, Siemens generated revenue from continuing operations of €71.9 billion and net income of €5.5 billion. At the end of September 2014, the company had around 357,000 employees worldwide. Further information is available on the Internet at www.siemens.com. October 2015

National Infrastructure Commission call for evidence: London's transport infrastructure

Written evidence submitted by Slough Borough Council

Introduction

Slough is integrated into the heart of the UK transport and communications network, being located between the M4, M40 and the M25. It benefits from three exits off the M4 motorway giving easy access to both London and the West Country, three railway stations (Slough, Burnham and Langley) providing links to Reading and London Paddington via the Great Western mainline and is located within 10 minutes of London's Heathrow Airport.

The borough is home to the Slough Trading Estate, the largest privately owned industrial estate in Europe, and has the highest concentration of corporate headquarters in the country (outside London). Slough is attractive as a business location because of its transport connections but it lacks a direct rail connection to Heathrow, something that local businesses say is required – Heathrow currently has rail access in only one direction, towards London.

Slough has broadly equal numbers of outward and inward commuters travelling to and from London on a daily basis – 13,178 residents travel to London and 11,012 workers travel from London [source: Census, 2011].

Many Slough residents rely on Heathrow for their livelihoods, with more than 7,000 working in airline related industries, and with 5.6% of Heathrow's directly employed staff drawn from Slough.

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

We question the reference to commuter hinterland and would ask that the commission recognises the interdependencies in the commuter patterns and in business structures and reflect that Slough functions as a part of a greater London.

- Economy – Slough has a strong and thriving economy but the town's proximity to London and its strong links with the UK's transport and communications network are recognised as providing a key locational advantage for business. Access to this concentration of business and employment land on the edge of London adds to the city's critical mass as a global centre, supply chain opportunities and other synergies. Securing a pipeline of affordable employment land and premises is a challenge.

- Labour supply – Analysis by the Thames Valley Berkshire Local Enterprise Partnership (TVB LEP) has identified labour supply issues as the single biggest threat to the continued growth of the Berkshire economy.
- Skills – The demand for higher level and specialist technician level skills by business continues to grow and the skills system is not always delivering what business needs leading to skills shortages and hard to fill vacancies. The increase in travel to work times suggests that businesses have to recruit from a wider catchment area to fill their vacancies.
- Housing – Demand for housing is increasing rapidly and the recent Strategic Housing Market Area Assessment (SHMAA) for Slough has indicated that we need to build in excess of 900 dwellings each year, a significant increase on the previous SHMAA of less than 350 dwellings each year. The delivery of schemes such as Crossrail, are driving up the demand and cost for housing locally. The shortage of development land for housing represents a significant challenge in delivering the housing numbers required to satisfy the housing need from within the borough and therefore any outward movement from London.
- Transport – Slough is well served by rail transport links in to and out of London but lacks the rail transport infrastructure to make orbital journeys around London. The Western Rail Link to Heathrow scheme due to be delivered by the end of Network Rail's Control Period 6 programme is a vital link for Slough, the wider Thames Valley and further afield in providing a direct transport link to Heathrow.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?

What might their potential impact be on employment, productivity and housing supply in London and the southeast?

Western Rail Link to Heathrow (WRLtH) – This scheme offers economic and environmental benefits to London by strengthening its economic hinterland as well as to the hinterland. It will improve access to Heathrow for 12 million people to the west of

London, particularly the Thames Valley and including the far south west and south Wales. It has the potential to deliver a through route to Paddington via Heathrow.

- The business, economic and environmental case for the scheme, first assessed in 2011 and now being refreshed and based on the current two runway airport, is strong – £1.5 billion of efficiency savings, £800 million of additional economic activity, 42,000 new jobs, modal shift from road to rail, one million fewer road journeys and 5,200 tonnes less CO2 released into the atmosphere – and projected to be stronger.
- The scheme is particularly important in retaining major business in the Thames Valley and beyond. 75% of businesses state access to Heathrow as a primary factor in their choice of location.
- The maintenance and enhancement of the strength of the economic hinterland will have additional benefits to London. The potential modal shift of traffic to Heathrow from road to rail (currently estimated at c20% from Reading and Slough) will have a positive impact on traffic flows on the strategic road network to the immediate west of London.
- The scheme is now anticipated to enable an additional through route from the west to Paddington, so creating added capacity, resilience and passenger options on the rail network and potential greater modal shift. This will have additional economic and environmental benefits to London and the hinterland.
- The scheme has been confirmed in the Hendy Review but to a later timetable. This largely reflects the past and recent delays in delivery. It will now not be operational until 2024 delaying the realisation of significant benefits and potentially deterring business commitment further. It was originally anticipated that the scheme could be open for use before 2020.

Action: We would like to see the National Infrastructure Commission reviewing the scheme delivery plan and working with delivery agencies to identify and implement actions that bring forward the operational date. Schemes which have a strong business case, strong local and regional support, and a clear identified need should be prioritised.

Action: We would like to see the National Infrastructure Commission reviewing the Development Consent Order (DCO) process in general to look at the burdens and delays inherent within the process to identify ways in which it can be streamlined.

Great Western Mainline services – A fast (under 20 minutes) train service to London is available twice per hour only with the remainder of trains operating as stopping services taking in the order of 45 minutes to reach London. Although not a large scale infrastructure improvement, incremental upgrade of services to run more frequent fast train services would make a significant difference to train service users in and out of London. Similarly, by introducing Oyster card payment (scheduled for introduction when Crossrail services go live) or contactless payment card systems now would provide rail service users with simpler, faster access to trains.

Cycle schemes – Slough has invested in a [cycle hire](#) scheme which it would like to see integrated with the London “Boris Bikes” scheme, extending the reach of the Slough scheme and providing a seamless hire facility for cycle users. To facilitate safe cycling we would like to see investment in safe, green cycle pathways connecting Slough to London, for example, by upgrading the towpath of the Grand Union canal.

Slough Mass Rapid Transit (SMaRT) – Slough has started work on a scheme that will provide a priority bus service for workers arriving at Slough Station to travel to their workplace on the Slough Trading Estate; the second phase of this scheme will see the service extended to Heathrow. We would like to see the service extended further but this will not be possible without the support of Transport for London and the London Borough of Hillingdon.

Action: We would like to see the National Infrastructure Commission recommending and facilitating closer working between public transport authorities to create more flexible bus service routes and supporting road network upgrades to facilitate priority bus services, for example, A4 corridor from Slough to Hillingdon.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

No comment.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?

What innovative funding mechanisms could be considered to support delivery of key schemes?

No comment.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

No comment.

Slough Borough Council gives consent for this submission to be published and identified as the author.

[contact redacted]

Submission dated: 8 January 2016

South London Partnership
Response to National Infrastructure Commission Call for Evidence
January 2016

1. Introduction

The South London Partnership represents the Boroughs of Croydon, Kingston upon Thames, Merton, Richmond upon Thames and Sutton, and through the South London Transport Strategy Board also involves Lambeth, Wandsworth, TfL, operators and businesses in developing a transport vision for the sub-region. Through the South London Growth Board, working with the GLA on wider economic development issues, we are also actively engaged in making the case for increased investment to enable economic growth of the sub region.

The South London partners have an agreed vision for the sub-region:

"South London will be a vibrant sub-region contributing to London's competitiveness and sustainability, through increased employment, a high skilled workforce and a high quality of life – supported by an enhanced and sustainable transport infrastructure".

We are therefore strong advocates for South London on all transport, planning, economy and business matters, as evidenced by our work to date with a wide range of stakeholders, agencies and communities.

2. The call for evidence

We welcome the creation of the National Infrastructure Commission and its objective of providing independent advice to government on long term investment choices. We recognise that the plethora of agencies historically involved in major infrastructure decisions have not always been coordinated or managed well and therefore we would expect that future infrastructure plans and policies will be enhanced by your role.

This response to the call for evidence has been developed by the South London Transport Strategy Board and reflects strategic sub regional matters or concerns shared by all of our Boroughs, and where appropriate specific local issues of the individual South London Boroughs will be considered in their own organisation's responses.

Having reviewed the call for evidence we will focus our response on section 3: London's transport infrastructure.

In our response below we identify the key issues for South London and then provide more specific comments that reflect the questions in the call for evidence.

3. Key issues

We have in recent years made the case for significantly enhanced transport investment for South London to not only resolve existing transport capacity, reliability and quality issues, but build sufficient network capacity to enable our medium and long term growth objectives and targets to be achieved.

The growth agenda remains a key issue for South London. The population forecasts are now double those identified in the 2004 London Plan, with the latest projections at nearly 240,000 additional people by 2020 (that's equivalent of another Merton) rising to over 400,000 by 2031 (equivalent to another Croydon).

This of course creates great pressures on employment and services. The London Plan forecasts around 800,000 additional jobs but these are mainly located in the City. The GLA forecasts that South London is set to achieve only 40,000 additional jobs. SLP has developed alternative forecasts showing the sub-region could grow by 120,000 additional jobs. Far from being overly ambitious we believe that with the population now forecast to double even this number of new jobs is insufficient to keep in line with general population growth. We should be seeking to achieve one new job for no more than every two people added to the South London population.

The South London sub-region is well connected to central London by rail from our largest town centres but overall it has the lowest connectivity of any sub-region and we believe this is a principal constraining factor on our economic growth. We recognise that South London needs to access employment in Central London and the Docklands but also needs to have sufficient connectivity to develop our sub-regional centres to facilitate economic growth locally. As a 'resource exporter' South London in effect is an economic 'donor' to other areas of London, which is undermining our own sub-regional economic sustainability.

We can, of course, point to the scale of the transformation already underway, and the approach adopted by our Boroughs - for example Croydon's Growth Zone will deliver upwards of 23,500 new jobs and 8,300 new homes in Croydon's opportunity area by 2031, through the development of brownfield sites in the centre of the borough. The annual Gross Value Added equivalent of these jobs is estimated to be in order of £1.2 billion by 2031. Croydon's growth zone will therefore have a significant positive impact in delivering South London's Growth+ agenda and its success is built on strong existing and enhanced future public transport links.

With Croydon's renaissance already well underway, Kingston is also on a trajectory to deliver its own significant growth aspirations. The Borough is working with the Mayor on developing an opportunity area framework which will deliver new jobs and homes, as well as bringing forward district centre regeneration, for example in Tolworth. Sutton and Merton are also planning a significant housing contribution through the designation of housing zones in Sutton Town Centre, Hackbridge, and Morden; and Richmond provides outstanding quality of life, with some of South London's most attractive and popular residential areas. These opportunities for growth and regeneration amount to substantially more than 'business as usual', and are based on a clear vision and driving ambition to make South London the capital's first choice business and development destination which will deliver our Growth+ agenda.

Even if South London were to conform to what is sometimes seen as its traditional suburban role the need to deliver housing that meets our existing community requirements is also an increasing concern. We have sites in South London that are recognised as suitable for development but are slow to be brought to market because of

both perceived and real connectivity issues. A step change in transport infrastructure, network capacity and service quality, across all modes, is therefore needed to give the private sector confidence to invest in building new homes in our Boroughs.

South London has the highest road-based modal share of any sub-region, together with some of the slowest journey times due to congestion and inadequate road capacity. Indeed TfL have indicated that parts of our sub region already have longer journey times and higher congestion than is forecast without any investment by 2031 in parts of East London. In short our case for investment in all modes is more pressing than most other sub regions of London.

Many residents, workers and businesses in South London are dependent on rail services, given the sparse nature of the London Underground network, and they are vital to the continued growth of the South London economy. With the limited Underground provision in our sub region this inevitably places great reliance on the heavy rail infrastructure provided by Network Rail. Through our South London Rail group we have been proactive in engaging with Network Rail, Train Operators and TfL for greater investment, with some positive wins on Thameslink and the Overground network, but many disappointments as rail investment goes through perpetual “stop-start” cycles.

Inevitably there is investment required to make rail services more operational efficient and reliable now, while accessibility improvements are still needed for many of our stations. We have some of the busiest stations, feeding onto parts of the most overcrowded rail network in the UK. Therefore, we believe that these essential improvements should be promoted where possible from the long term planning to more immediate delivery. Through the NIC we will want to promote our case with Network Rail, Train Operators and the Department for Transport for credible short, medium and long term investment plans that can be delivered.

The Partnership fully supports the Crossrail 2 project and believes that it is essential to enable sub-regional centres in South London to compete effectively in terms of attracting new businesses, employment growth and increased retail trips. Crossrail 2 will bring the economic, social and accessibility benefits that the communities on the initial Crossrail 1 line will shortly be enjoying. In the response to the questions below we consider in more detail the expected benefits, approach to funding and ideas for managing costs.

Working with TfL over recent years we have been developing a Tramlink Strategy and route options for extensions, as annual patronage on the Tramlink network is currently at around 30m, when the network was originally designed for only 20m. It has proved a popular mode of choice and at peak times parts of the network suffer from severe overcrowding equivalent to the peak levels on major Underground lines. When considering priorities for investment Tramlink meets all of the core objectives – it is delivering significant local transport capacity, providing orbital links thereby opening up new growth opportunities and is hugely popular with users.

Tramlink is a prime example of the benefits of local transport infrastructure being enhanced to enable both radial and orbital routes in the sub region. It also highlights that for many of our communities it is local bus services that provide the key links to our metropolitan centres and key towns, as well as linking to employment, education, health,

retail and leisure opportunities. Local buses can easily “fall off the radar” when compared to major investment in road, rail, underground or tram services, but for our sub region it is the dominant form of public transport for many. Investment on bus infrastructure, including segregated routes and greater bus priority, enhanced interchange and modern hybrid or alternative fuelled vehicles, has been a longstanding component of our South London transport strategy.

Cycling is becoming an ever popular mode of transport and is environmentally friendly, brings significant health benefits and reduces congestion. The Mayor has a pan-London target with cycling accounting for 5% of the modal share by 2026. To achieve this goal a significant increase in cycling is needed on current levels across the whole of London and in particular in outer London, where generally the cycle mode share is less than 2%.

South London has the highest dependence on cars, accounting for at least 45% for all journeys made, and due to both to this and its demographics has the largest potential to realistically shift 700,000 journeys from car to bike.

Given the mayoral interest to promote and develop cycling, the Mayor through the TfL Business Plan has made provision for £910m for cycling. In order to secure this funding, sub-regional partnership working with the Boroughs is needed to provide innovative ways to increase the modal share within the sub-region. To this end SLP with the South London Transport Strategy Board was the first sub-region to publish its own cycling proposals (the South London Cycling Charter - December 2012). We believe such strategies can be utilised by the key agencies to identify the optimal investment choices for cycling infrastructure over short, medium and long term and we urge the NIC to include significant levels of new cycling infrastructure in its assessment of London's transport investment needs.

4. Response to the Questions

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

As with all of London and south east England we see meeting the new travel demands arising from unprecedented population growth in South London as the major challenge. We have established a South London Growth Board to ensure that these fundamental issues affecting our sub region are considered in a coordinated and effective approach, always reflecting individual Borough priorities, but also recognising a collective desire for economic growth.

We have for some time been strongly concerned that with the anticipated population growth, if not matched by significant employment growth within our sub region, will accentuate the concentration of new jobs in central London and create even greater pressure on our already constrained radial routes. We recognise that demand for such trips and access to the centre will grow, albeit within increasingly confined physical limits on key rail routes specifically (even with Crossrail 2) and so we continue to make a strong case for what was once described as the “polycentric city”, where our metropolitan centres and key towns equally become the focus for new jobs and transport oriented development, reducing the need for radial trips to central London.

To achieve this goal, change perceptions and travel behaviours we need investment in high capacity orbital links that kick-start both housing and employment growth more evenly across the region. If we do not address this key spatial issue we will continue to have residents of Croydon, for example, more willing to take fast but crowded trains to central London, than choose employment nearer in say Kingston or Bromley, but with a journey three to four times longer on average. Such key differentials in commuting options continue to distort both the employment and housing markets and hamper growth in our sub region. It has long term social impacts and will reinforce the negative outcomes on life choices, health and wellbeing for many of our communities.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

- *How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?*
- *What might their potential impact be on employment, productivity and housing supply in London and the southeast?*

It is perhaps too easy for any community, local authority or businesses to respond to questions such as this with a “shopping list” of schemes and projects which it may have had long term ambitions for, but never secured the funding. In our transport strategy development we have consistently returned to first principles to consider the context, the need, how demand develops and is managed, and then finally what is the infrastructure that is required to meet rigorously tested growth objectives. Through this process we have naturally developed priorities which seek to address the most pressing travel needs, open up development opportunities through enhanced access, change travel patterns to meet new demands and be broadly acceptable to our communities.

To meet such a prioritisation we would therefore expect that our South London partners will support national and London government when it achieves the following transport investment outcomes:

- Capacity, reliability and quality improvements on existing radial routes to central London – to meet planned for jobs growth in the centre and housing growth in our sub region - primarily rail investment by DfT, Network Rail and TfL on the key south west, south eastern and southern lines into London Bridge, Victoria, Waterloo and across London to the north.
- Provide significantly increased capacity on new routes and services into central London – to enable new and existing residents in South London to access employment in central, north, east and west London – which should focus on funding and delivering Crossrail 2 as the highest priority, but also through rail devolution develop new and enhanced Overground and Underground routes.
- Enhance existing and develop new orbital routes linking our metropolitan centres to areas of housing growth – enabling new travel patterns to develop and take pressure off of our key radial routes, enabling greater access to jobs, education, healthcare, retail and leisure, resulting in strong economic growth being spread throughout an

area and not just on radial corridors. This would include suburban rail and South London Metro options, new Overground links, Tramlink extensions, segregated bus corridors, cycle superhighways and Mini Holland type schemes. We would expect to see some new highways capacity developed at key locations, recognising the sensitivity to roadbuilding in our communities.

If such investments were made to deliver projects over the next twenty to thirty years (importantly starting now to plan and develop the projects) we believe we would see a fundamental change in the way that London grows and develops, with a more distributed population, greater economic strength overall and social diversity reflecting the new communities being built in South London. Without such investments all of the South London Boroughs will have to consider how they can meet pan London growth targets and whether they have to effectively discourage population growth unless it is fully matched by complementary investment in access, movement and mobility.

A key issue is programming investment to secure the greatest benefit. We are very conscious of the interdependencies between investments in various areas of infrastructure in terms of delivering optimum levels of development – it is rare that investment in one mode only secures a step change in growth. For example, at Tolworth, while Crossrail 2 is an essential piece of public transport infrastructure which will help facilitate growth in this area of opportunity, there is an associated requirement to improve the A3/A240 road intersection and identify supporting new road arrangements in the area which will help free up space for the required redevelopment. In particular this involves reducing the severance effect that the A3 Trunk Road has on this area. There are number of examples in our sub region where a greater coordinated investment plan will pay considerable dividends in bring forward growth in jobs and homes.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

TfL and Network Rail have engaged with SLP over several years to demonstrate the benefits of the Crossrail 2 scheme and ensure that the transport benefits – offering additional capacity, new route options and higher quality services – are seen as part of the wider leverage of growth opportunities that can be unlocked by major transport investment. Therefore we have reviewed the scheme design options, business case and funding proposals issued to date and at a strategic level recognise the benefits of the current proposed scheme. As always we will wish to delve further into the detail to see how any specific issues of winners and losers occur locally on our stations, routes and timetable, as the project is being developed. However on balance at the moment we believe that the benefits, both transport and non-transport, will probably be maximised with the current scheme and further route extensions or new stations, for example, would only add increasing complexity for marginal benefits.

We have been long standing advocates of the Crossrail 2 regional option, which includes a number of south west branches that would make a significant difference and enable real sustained growth in our Boroughs. Therefore any cost cutting which resulted in the loss of branches or stations, capacity or frequencies would, we believe undermine the viability of the whole project and specifically the benefits to our residents and businesses.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

- *What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?*
- *What innovative funding mechanisms could be considered to support delivery of key schemes?*

We recognise that public sector finances are facing a period of unprecedented austerity and this will have a direct and long lasting impact on transport funding across the UK. While we can seek to harness the interest and funding available from the private sector, whether through development contributions or direct equity investment, we have to assume that the availability of significant public funding for major transport infrastructure is going to be limited.

In such a volatile situation it is therefore important that the promoters of transport infrastructure schemes carefully identify where the user benefits are the greatest and whether there are the funds available or willingness to contribute from each of the key stakeholder groups – residents, transport users and businesses. Seeking funding from all of these groups, or just one, needs to be modelled and tested, in terms of both direct and indirect impacts. At this stage we do not have a view on the right balance between the potential contributors, to either top up or totally fund investment improvements. Our individual Boroughs are likely to have a stronger sense of what is achievable based on their communities, businesses and political views.

An example of this is the funding mechanism for Crossrail 2, which was subject of various studies in 2014 and ongoing development work. We recognise the scale of investment required to deliver the whole of the Crossrail 2 project, but also can see this is outweighed by the major impact on the productivity and economic growth of south London and the city more widely. Crossrail 1 is being funded through a combination of fares revenue, the Business Rate Supplement and Mayoral Community Infrastructure Levy (CIL). It is because of the London wide benefits that we want to press the Mayor and TfL to reflect the Crossrail 1 approach to securing funding from all London Boroughs (and if possible Surrey and Hertfordshire). At this stage to propose funding is drawn from only from the boroughs or developments that directly benefit from the south west to north east routes could be seen as inequitable and could be seen as unacceptable to our communities, businesses and political leadership.

We recognise the call for innovation in funding solutions, but are cautious in recommending an alternative to the current mix of grants, loans and community or business precepts. The experience of the Tubelines PPP, the Metronet PPP and the Tramlink and Docklands PFI schemes, all brought back into TfL control in the last 10 years, is a salutary reminder of the risk of these long term “buy now, pay later” funding options. We do think that there is benefit in revisiting “value capture” or Tax Increment Financing (TIF) type approach (as being used on Nine Elms redevelopment) but again need to see strong evidence that unforeseen impacts on business and economic growth may not occur. If a TIF type funding model was applied to the businesses along the line of the

Crossrail 2 route there is no guarantee all will equally benefit from the scheme or can equally afford to pay for it. Business benefits and economic growth are much more complex to estimate than a simple TIF charge and therefore we will want to be convinced how any alternative to the approach adopted for Crossrail 1 can be more effective and less risky.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

We have not undertaken sufficient research to respond fully to this question, but recognise the value of learning from the experience of cities around the world in terms of funding and delivering transport infrastructure in many innovative and effective processes. We should also recognise the fast pace of change being achieved in devolved local authorities in the north of England and lessons learnt with the devolved governments of Scotland and Wales.

Response to the Infrastructure Commission Call for Evidence October 2015

Streatham Action is a voluntary, non-political group in Streatham informally elected at a public AGM to campaign for improvements to life in Streatham, and sanctioned by, though independent of Lambeth Council. Specialist sub-groups were created in 2015 to deal with subjects that are of the greatest concern to residents, namely Transport and Planning. www.streathamaction.org.uk.

The Streatham Action Transport Group is delighted to have the opportunity to respond to the Infrastructure Commission's Call for Evidence and interest in fresh and innovative perspectives. Our area of interest in this consultation is London's transport system, in particular strategic options for future investment in large-scale transport improvements on road, rail and underground - specifically Crossrail 2 - and the consequences for Streatham and the A23 corridor and future connectivity.

Streatham Action recommends that the Crossrail 2 route map, as it currently stands in the SW London area, be adjusted to one that would omit Balham as a CR2 station, but instead run from Clapham Junction through a new CR2 station at Streatham - which would provide a Southern Rail interchange required in SW London - and on to a reinstated CR2 station approaching from a south-easterly direction at Tooting Broadway. This would provide the vital interchange in SW London with the Northern line.

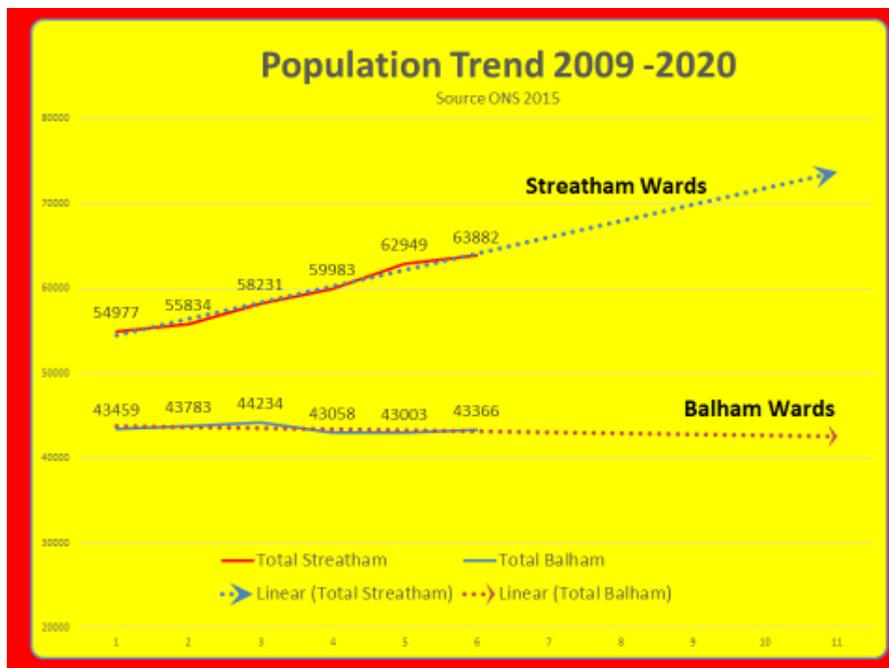
Our group does not have access to all statistics and modelling from TfL, Network Rail or local or national government bodies. However, it seeks to

- Highlight areas in which we believe review and supplementation of work undertaken to date by the GLA and TfL are necessary in order to enable prioritising of the strategic transport challenges faced over the next 20-30 years that may constrain economic growth in the key corridor approaches to London.
- Provide evidence that further investigation of the needs and potential of our geographical area of interest is necessary before priority outcomes for London's future transport infrastructure choices are decided upon, with particular reference to capacity, reliability, journey times, and connectivity
- Highlight that the lack of investment in transport infrastructure in Streatham and the A23 corridor is a gap that continues to lead to failure to tackle existing and prepare for future challenges in order to target desirable outcomes.
- Consider that Crossrail 2 is the only major future transport infrastructure project within 20-30 years that could address the critical transport situation in Streatham, and also has the capacity positively to impact road, rail and underground outcomes in the area and for connectivity London and the south east as a whole.
- Submit that, although already sharing the burden of cost for funding and financing Crossrail1, the Overground, the Northern Line extension, the Bakerloo line extension etc. through Council Tax precepts, residents of Streatham and its hinterland are not benefitting equitably from the benefits of such investment.
- Show that Streatham and the surrounding area has the capacity for economic regeneration in the form of employment, greater productivity, and affordable housing if provided with the necessary transport capacity.

Major economic and social challenges facing London and its commuter hinterland over the next two to three decades

Population growth, with resulting pressures on transport, health, education, and other social infrastructures, as well housing availability and affordability that is driving younger people towards outer areas will continue to put pressure on London and its hinterland.

Our focus is on the key south London corridor with particular reference to Streatham, which has undergone massive and unpredicted population growth of 28% over the last 10 years (ONS 2015). Significantly, since Crossrail 2 considered Streatham as part of any route option around 2011, using data Streatham Action estimates to be from 2009-10 or earlier, population across its four wards has increased on average 16% since then, and the upward trend is projected to continue.



This rate of population growth (16%) is in contrast to that of Balham, which has seen a slight population decline over the same period, but is currently part of Crossrail2's proposed route through south west London. Streatham's growth also outpaces the 9% predicted for Lambeth and 10% for London as a whole over the next 10 years (Lambeth Demography 2015).

Population growth in Streatham has led to a dramatic increase in the demand for public transport, among other infrastructure services, which is evident and manifest in a surge in station usage at all 3 Streatham stations – over 58% since 2009-10 at Streatham station, for example. There has been an increase in footfall at Streatham stations between 2013-14 and 2014-15 alone of 574,868, according to Office of Rail Regulation Entry and Exit Data. Logic dictates that this surge is likely to be a major factor in loading the Northern Line at Balham.

Since 2009-10, when we believe Crossrail2 last considered any option including Streatham, there has been a staggering 92.8% (4,818,096) increase in entries and exits across all Streatham's railway station. See chart below.

The impact of this is plain to see at peak hours with overcrowded trains already at full capacity, and there are no plans whatever in prospect for transport infrastructure improvement for at least another generation. Significantly, for the time period Crossrail2 were most likely using in the assessment of the two options including Streatham, passenger numbers at its stations were declining, thus projections in their modelling may have extrapolated the trend, with inevitable consequences that ruled Streatham out. Streatham Action believes these facts alone demand further investigation by TfL and the GLA into the case for Streatham to be included in Crossrail2.

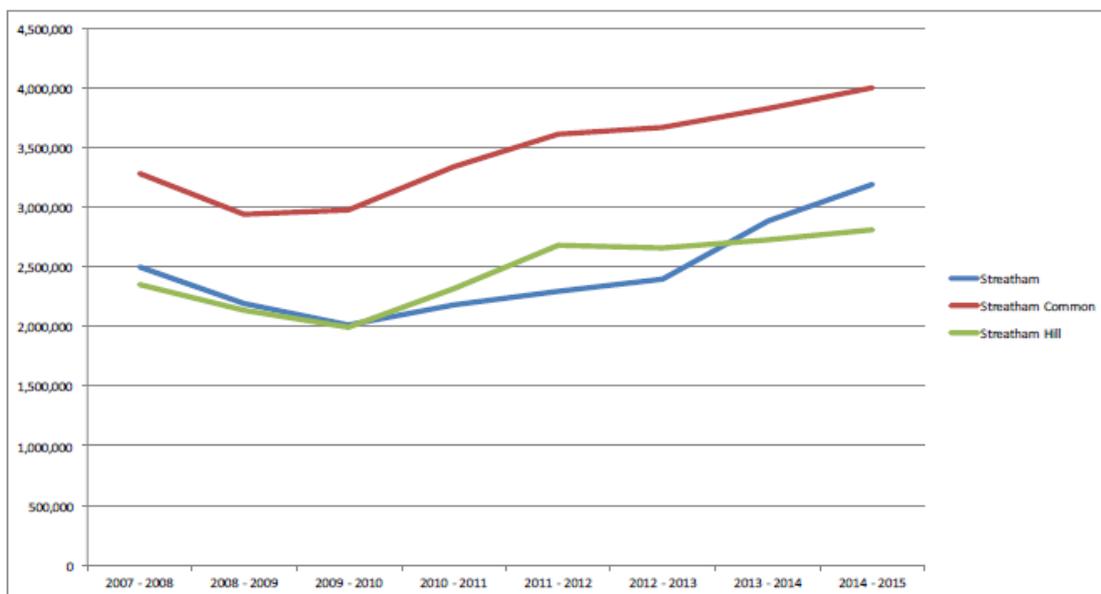
Office of Rail Regulation Entry & Exit Data 2006 – 2015

Office of Rail Regulation Entry & Exit Data 2006 - 2014

	2006 - 2007	2007 - 2008	2008 - 2009	2009 - 2010	2010 - 2011	2011 - 2012	2012 - 2013	2013 - 2014	2014 - 2015	Increase on 13/14
Streatham	1,723,835	2,501,022	2,192,570	2,015,864	2,179,456	2,301,700	2,396,904	2,883,734	3,194,098	310,364
Streatham Common	2,994,714	3,282,824	2,942,892	2,977,568	3,346,078	3,612,564	3,668,806	3,827,296	4,003,938	176,642
Streatham Hill	2,004,200	2,355,874	2,137,376	1,996,690	2,322,980	2,684,506	2,661,068	2,725,320	2,813,182	87,862
TOTAL									10,011,218	

Office of Rail Regulation Interchange Data 2007 - 2014

Streatham	410,372	385,854	342,744	362,370	300,103	307,393	359,329	468,879
Streatham Common	118,345	191,005	175,741	185,217	191,538	161,136	156,635	197,575
Streatham Hill	0	0	0	0	0	0	0	0



Streatham was originally considered for 2 route options by CR2, with the option of a route from Victoria to East Croydon (see chart) and beyond being the route selected for in-depth investigation. Streatham Action has been advised that the inclusion of East Croydon in the route, with its existing rapid direct train services to central London, would have meant that the route including Streatham would have showed only small journey time savings overall. Streatham has never been appraised in the context of the current route through SW London by CR2, to our knowledge.

Underpinning this, however, is the question of why the needs of Streatham (and possibly other areas in London) have been overlooked by transport planners. Identifying and addressing these reasons is key to identifying the most effective strategies for the future.

Crossrail 2 options

“Optioneering” and appraisals 2009-11



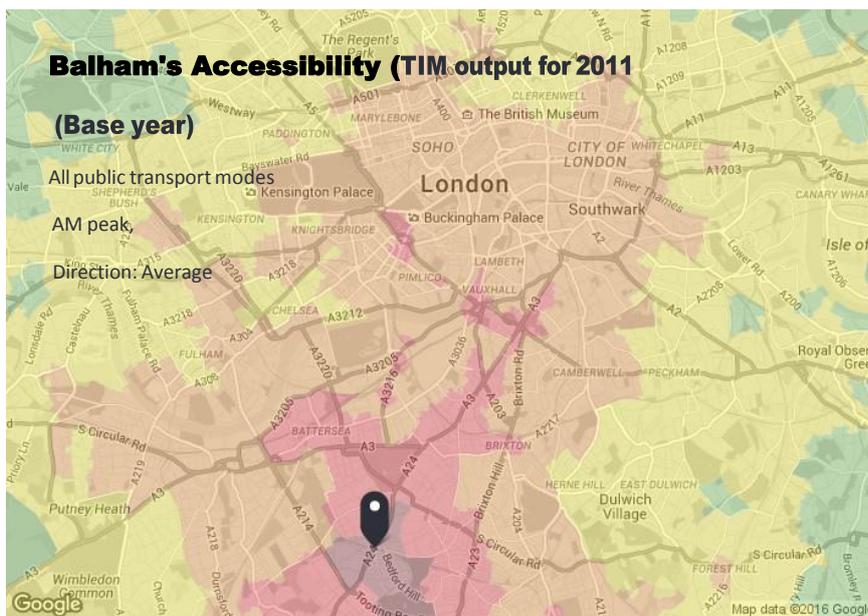

Streatham was assessed >5 years ago for other possible routes but discounted

Public Transport Accessibility Level

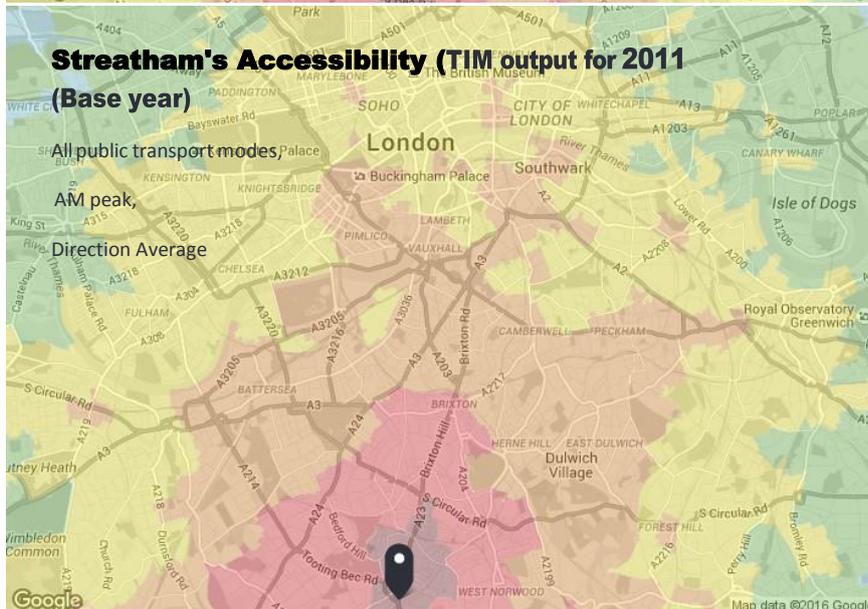
TfL use PTAL as an indicator for the level of accessibility of an area in planning. Areas like Streatham, which has a PTAL score comparable with that of Balham are considered to have high levels of accessibility to public transport. However Streatham relies heavily on buses, meaning journeys are slow and unreliable compared with those from Balham, which has 3 tube stations and 2 railway stations providing fast access to most of central London. PTAL also has no reliability or capacity factor.

It is clear PTAL is a flawed tool for assessing passenger need with public transport provision. PTAL scores public transport accessibility, taking into account walk time to stop, number of services available and the frequency of services, but crucially, does not include destinations and travelling time. Streatham Action urges the use of more sophisticated additional data such as the TfL's new time mapping feature, TIM, which enables planners to map expected travel times when considering

transport improvements such as Crossrail.



TIM maps here reproduced from the TfL website show Balham has superior transport links than Streatham. Most of central London is accessible within 30-45 minutes from Balham, while it is 45-60 minutes from Streatham. This time difference must be weighed in the balance against the value of saving an extra five minutes of time for commuters from outlying London suburbs when considering the logic of including a Streatham station in the Crossrail2 network.



Map key - Travel Time

- | | |
|-----------------|-----------------|
| 15 minutes | 15-30 minutes |
| 30 - 45 minutes | 45 - 60 minutes |
| 60 - 75 minutes | >75 minutes |

PTAL also determines how much parking must be provided at new developments, with high PTAL scores requiring low parking provision, and vice versa.

“Public Transport Accessibility Levels (PTALs) are used by TfL to produce a consistent London wide public transport access mapping facility to help boroughs with locational planning and assessment of appropriate parking provision by measuring broad public transport accessibility levels. There is evidence that car use reduces as access to public transport (as measured by PTALs) increases. Given the need to avoid over-provision, car parking should reduce as public transport accessibility increases.”

Para 6.43 Mayor of London’s Spatial Development Strategy: The London Plan (2011)

In Streatham, Norbury and the surrounding area, the outcome of this reliance on PTAL scores to determine policy is manifest in full capacity usage at all three railway stations at peak times, one of the most congested and polluted major roads into the capital, the A23, through increased car and bus usage, and street parking at saturation. As long as PTAL alone is used to assess public transport accessibility.

Political Minority Areas

Streatham Action suggests that London Plans should be prepared with ongoing and thorough consultation with local groups and businesses aside from input from Borough Councils better to assess and identify key factors such as population growth and projections and other drivers of investment policy. Streatham has been in economic decline since the 1960s. The political will to investigate and present the case for the area to policy makers has been a frustrating factor. The fact that most of Streatham's councillors have, until recently, not been part of the majority party in Lambeth Council has meant that efforts to investigate and make the case for Streatham to receive the transport improvements it desperately needs have been fragmented by partisan lobbying. As a result, the council's input to the GLA London's Plans has neglected the needs and economic potential of the area. It is possible that this situation is replicated in other parts of London.

Border Areas present hidden opportunities

Streatham lies at the boundary of several boroughs-Lambeth, Wandsworth, Merton, and also Croydon, which means measurement of its needs (in common with those of many "border towns" in London) and benefits of meeting them are fractured by political boundaries which determine the collection and interpretation of statistical information that drives policies. A less boundary-bound consideration of available information – using small area and ward-level statistics to investigate border areas like Streatham would unveil considerable potential for economic regeneration across the Capital which could then be provided with the necessary infrastructure to bear fruit.

Strategic options for future investment in large-scale transport infrastructure improvements in London

A23 Corridor/Streatham High Rd

Access to Gatwick Airport and the Croydon Opportunity Area to and from central London are heavily impacted by this key corridor which of which Streatham High Rd is a part.

Croydon, with London's largest population by borough, is expected to grow by another 15-20% in the next 20 years. As a designated Opportunity Area in the London Plan, it is in process of increasing residential density in the office-dominated central area, with capacity for 7,300 homes. In addition the redevelopment of the Whitgift shopping centre into a modern retail and entertainment hub to serve the region has major implications for transport needs that impact the A23 corridor across road, rail, and potentially underground too.

Streatham falls within the catchment area for the new Whitgift/Westfields Centre, and will be marketed by it to attract customers. There are no plans to upgrade transport links to meet the increased desire to access Croydon from Streatham or anywhere in the A23 corridor. It is inevitable that many of the thousands of new residents in Croydon will put further pressure on transport infrastructure.

In Streatham the A23, which is the responsibility of TfL, has conflicting uses that mean it is unfit for any of its variety of designated purposes. It is Red Route and major arterial road into central London and primary route for many key bus routes, while at the same time it is the centre of one of the major towns in Lambeth with associated shopping, restaurants, entertainment, and offices. As such it is often bustling with people, who are exposed to traffic-associated pollution from what is anecdotally one of the most congested roads in Europe, and whose desire to cross the road at its many junctions means that traffic flow is interrupted by crossings at many points, while historic buildings on either side of the road create traffic pinch points at which the road cannot not be widened to accommodate bus and cycle lanes without the radical destruction of the character of the town centre. TfL's Clean Air for London data indicates traffic flow around the St Leonard's Junction at just under 25,000 vehicles per day with 4.64 tonnes/km of NO₂ pollution per year, of which almost half comes from buses. It is also dangerous with regard to road traffic accidents, with 45 deaths or serious injuries associated with the A23 in Streatham over the past 5 years.

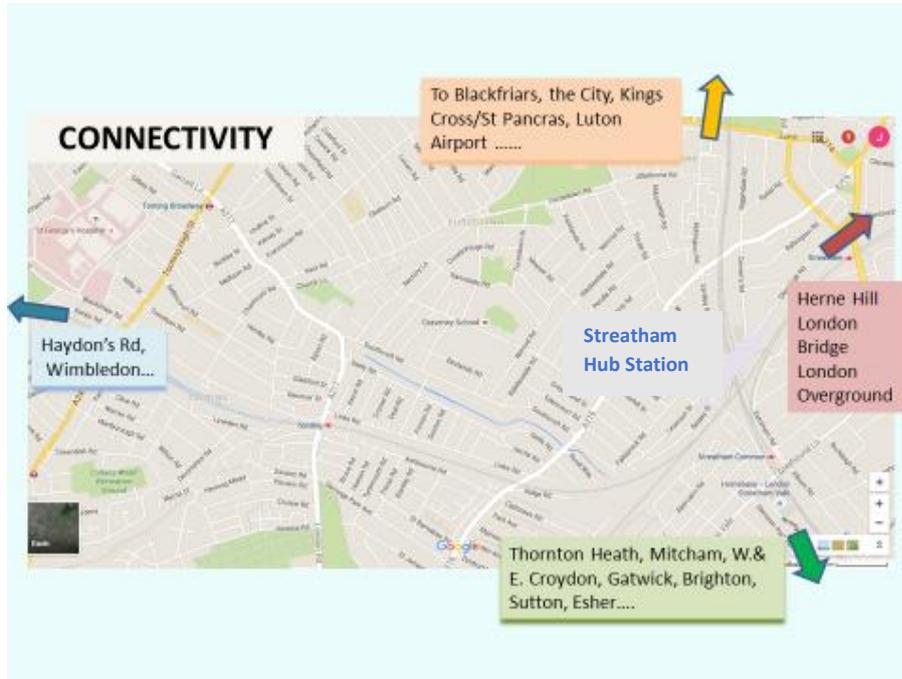
Streatham Action can only see a long term strategic solution in tackling the existing conflict in usage. TfL are proposing a radical solution in Croydon at the Five Ways Junction with a controversial flyover scheme, and Streatham Action would like to see a similarly bold approach to solving the A23 problem. A tunnel under the length of Streatham High Rd and through to beyond Norbury (another town centre which has its regeneration potential thwarted by the A23 and poor public transport options) for arterial A23 traffic would allow the High Rd to become a High Street with cycle lanes, a safe environment for pedestrians, and give it capacity to support thriving businesses and a vibrant town centre. A report by the Deputy Mayor for Transport, Isabel Dedring published in 2014 supports the creation of tunnelled roads - the A23 corridor is a prime candidate.

Devolution of Network Rail Controlled Services in South London to TfL Control

Streatham Action fully supports the call by the London Assembly's Transport Committee for control of services currently run by Network Rail franchisees to be passed to TfL. Devolution of Silverlink services in North London to TfL led to the development of TfL's London Overground, according to London Reconnections 2015 report, *Devocalypse Now: Taking Control of South London's Railways*. In the report, Devolving Rail Services to London, the LA Transport Committee specifically target South London rail services to become part of their responsibility, with longer distance services remaining within the remit of the franchise holder.

This would allow South London's rail services to be evaluated for the purpose of serving the needs of London, rather than the objectives of the franchisees whose frame of reference is to make profit from their entire network. As the London Overground has shown, it would allow for effective and practical long term strategies for London's rail network to be created, evaluated, and implemented holistically

Victoria Line Extension – a Streatham Hub with Crossrail2 Current and increasing pressures on rail services outlined above call for an urgent extension to the Victoria Line south of Brixton, through Streatham, Norbury, and Thornton Heath to Croydon. If Gatwick expansion takes place, this will be a necessity. In the current method of prioritising new routes, those locations with existing interchanges with the underground are prioritised over those areas that do not have underground at



all, in the cause of connectivity. This means that without a Crossrail2 station, Streatham may well be a low priority, whereas with one, there is the opportunity to develop Streatham as a transport hub, allowing connectivity with the Wandle Opportunity Area with the new football stadium planned for Wimbledon FC at Plough Lane, Mitcham, and Hackbridge, which

have space and potential for economic regeneration and new homes. "London will only be able to achieve its full potential if its infrastructure is upgraded to cope with the rising population (and) spread the benefits to additional areas of the city..." HM Treasury's Eddington report 13. *London's Infrastructure-Investing For Growth, London First March 2015*

What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

"Right now regeneration areas are absolutely at the bottom of the list in terms of priorities for transport because you prioritise investment where there are congested parts of the network and where people are not able to get onto platforms".. Commented Isabel Dedring, Deputy Mayor for Transport at the London Infrastructure Summit 2015. She continued, "If you have a business case for a scheme that is about regeneration or unlocking housing growth that business case will struggle to get through the internal processes of a transport oriented agency"....

A strategic change in the way transport infrastructure is planned better to prioritise regeneration opportunities would unlock hidden potential across the capital, and the A23 corridor including Streatham, Streatham Vale, Knight's Hill, Norbury, Mitcham Lane, and the A23 corridor through to Croydon is a case in point.

A station at Streatham would unleash great opportunity for regeneration, house building and job creation. The area has a considerable number of sites for new homes, offices, and shops some of which involve a change of use and increased densification. Streatham wards are below the borough

average population density, and subject to local planning policies that encourage the building of new homes in the area. Streatham, a Major Centre in the Lambeth Plan 2015 is identified as having "significant potential for new commercial and residential development....keeping the existing requirement for 50 per cent affordable housing across the borough and providing "support for tall buildings in appropriate locations to deliver regeneration and economic objectives".

London needs 50,000 new homes a year and Savills estate agents have concluded that the bulk of the demand is for homes under 450sq ft., including affordable homes of all types. Streatham is better placed than anywhere along the proposed Crossrail 2 route south of the river to offer sites for such "affordable" development. Foxtons estate agents data shows the average property price in Streatham was £396,838 in March 2015, compared with £700,161 in Balham. As the Lambeth Plan 2015 states, however, "it will not be possible to achieve the significant levels of housing and economic growth set out in the Local Plan without the supporting transport infrastructure required."

The development of Crossrail 1 shows a clear need proactively to integrate housing into the planning for Crossrail 2. This is entirely possible at Streatham Station, with significant acreage available at the site including an open bus standing, Council offices and a currently empty supermarket with 2 floors of parking beneath - a rough guesstimate at 4 acres at ground level and vertical development already sanctioned as 4 storeys and above in the Lambeth Plan. There is also potential in the immediate vicinity with the run-down state of many of the buildings in the area up to the St Leonard's junction on either side of the A23. This should chime with the need for Crossrail to be part funded by the revenue from above station property development at its own sites.

A Streatham Hub station extending behind the current Streatham station westwards towards the intersection of railway lines towards Streatham Common station junction is an ideal location for a Crossrail2 station, as it could provide connectivity with services to Wimbledon, Farringdon/St Pancras/Luton Airport, London Bridge/London Overground, Clapham Junction, Victoria, and East and West Croydon and Gatwick.

Prosperous Balham offers scant further opportunity for economic regeneration compared with Streatham and Tooting Broadway, which both offer significant capacity for retail and office development, job creation, densification and new home building. New homes in Streatham are also likely to be more affordable than in any of the other mooted SW London CR2 station locations.

Streatham station has the capacity to grow to "strategic interchange" status once the CR2 station is located there, but this potential will be wasted for another generation, along with untold billions of pounds worth of economic regeneration potential in this large town in Zone 3, and of the A23 corridor towards the south if it is ignored.

Removing stations in locations in which the majority oppose them in such as Chelsea and Balham is a way to reduce costs for Crossrail 2 in order to fund services into areas that have great need, such as Streatham. At the same time, this would unlock the great potential of the area for regeneration, new homes and new jobs, with benefits spreading as far as the Croydon and Wandle Valley Opportunity Areas.

What are the options for funding, financing and delivery of large-scale transport infrastructure improvements in London, including CR2?

Given that transport infrastructure improvements drive up values of both commercial and residential property both in London and in regions served by them, it is reasonable to charge a percentage of the uplift in value after the scheme has been implemented. This should perhaps be backdated to include areas now benefitting from the London Overground, and should also include

the Northern line extension, Crossrail 1 and HS2. If all of London is paying the same precept towards schemes like Crossrail1, those areas that do not directly benefit are unlikely to be happy to accept funding infrastructure improvements on the same basis as areas that they may perceive as advantaged.

Heavily discounted fares for the elderly, young people and key workers on low wages should apply at off peak times to attract revenue from ticket sales from groups that cannot afford fast transport options.

For road schemes, tolls could potentially fund the construction of tunnels into the Congestion Charge zone.

How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

Streatham Action, as a group of "lay" volunteers, does not have the resources to answer this question in a useful way.

Streatham Action www.streathamaction.org.uk

[Contacts redacted]



CLLR PETER MARTIN
DEPUTY LEADER

National Infrastructure Commission

Sent by email to londonevidence@Infrastructure-Commission.gsi.gov.uk

8 January 2016

Dear Lord Adonis

National Infrastructure Commission: call for evidence

We welcome the opportunity to respond to your call for evidence.

Surrey is a £37 billion economy, an economic powerhouse with a strong, interconnected relationship with London. For an economy like Surrey to function and support London's growth, we need world class infrastructure and investment in Surrey's rail, road and other infrastructure networks.

We have focused our response to your call on Crossrail 2 and the questions you have posed on London's transport infrastructure. Crossrail 2 is an exciting opportunity for Surrey. By releasing capacity on the South West Main Line and providing direct connections from stations in Surrey to Central London, Crossrail 2 will help Surrey and London remain globally competitive and boost productivity.

In recognition of the importance of the scheme, the county council has recently commissioned consultants to undertake an assessment of Crossrail 2. This detailed piece of work, shaped by engagement with stakeholders, is available to download at www.surreycc.gov.uk/surreyrailstrategy. The responses to your questions (see attached annex) have been considered relative to the Assessment and we hope that this detailed study will inform your own analysis.

Although your questions are focused on Crossrail 2, we have also provided evidence on further infrastructure schemes which should be considered as part of the solution to London's transport challenges. These challenges can best be met by both improving connectivity to London but also ensuring that there is investment in infrastructure that will serve to release pressure on London's transport network.

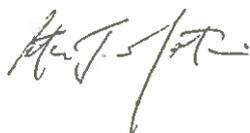
Where relevant we have highlighted links to further analysis including detailed work on the North Downs Line and A3. Our assessment of these schemes highlights that infrastructure investment could play a key role in achieving balanced growth across the South East.

In assessing priorities for investment and reaching agreement on how schemes are funded it

is important that London and the South East work together to define and promote a programme of cross-boundary transport investment that will provide mutual benefits.

Please do not hesitate to contact me should you require any further information.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Peter Martin', written in a cursive style.

Peter Martin
Deputy Leader of the Council and Cabinet Lead for Economic Prosperity

Annex 1: Questions posed by the National Infrastructure Commission on London's transport infrastructure:

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

Surrey is a strong economy which shares many of the economic and social challenges that London faces. Surrey is a £37 billion economic powerhouse. It is the largest sub-regional economy in the South East and is the only county with two international airports on its borders, presenting both opportunities and challenges.

Like London, Surrey is home to many international business headquarters, a highly skilled workforce and an innovative business base. The Surrey and London economies are both similar and interlinked. Over 130,000 Surrey residents commute into London daily, with some 66,000 coming from London into Surrey.

The demands of population growth and a strong economy place an obvious pressure on the county's infrastructure, notably the rail network which is struggling to meet current demand. Four Surrey train services are amongst the most overcrowded in the country (two of these on the South West Main Line) and forecast growth is expected to further exacerbate the pressure on Surrey's transport network.

Surrey's motorways carry 80 percent more traffic than the average for the region and the A roads 66 percent more traffic than the national average. Many of Surrey's roads already operate at capacity. If a traffic incident occurs, this can cause severe disruption on the wider network.

Surrey is also facing similar demographic challenges to London. By 2030 Surrey's population is predicted to increase by 12% (based on ONS figures). The largest proportionate increase in age categories will be those aged over 60, with the proportion aged over 85 rising most steeply.

Surrey's infrastructure is struggling to cope with these challenges and investment is needed now and over the long term to alleviate these pressures.

Through the Surrey Infrastructure Study we have sought to quantify Surrey's infrastructure deficit. The Study highlights the range of infrastructure needed to support growth. This detailed piece of work, which includes transport infrastructure, utility networks and flood protection should inform your own analysis and serve to highlight the interconnected challenges faced by the London and Surrey economies.

In terms of Crossrail 2, we fully support the case being made for the scheme which recognises that this new railway needs to serve the most productive and competitive parts of the UK economy including supporting employment and housing growth outside London.

The Crossrail 2 Assessment we have commissioned includes a detailed planning and economic baseline which sets out spatial and economic analysis along the proposed route. The Assessment is available to download at www.surreycc.gov.uk/surreyrailstrategy.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

- **How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?**
- **What might their potential impact be on employment, productivity and housing supply in London and the south-east?**

Context

The county council has undertaken considerable work on the large-scale transport infrastructure needed to support economic growth in the county and wider region.

Three priority options were identified in the Surrey Rail Strategy (September 2013):

- Capacity on the South West Main Line (SWML), including the Crossrail 2 scheme;
- Local orbital rail services, namely the North Downs Line; and
- Access to airports – examined in the Surrey Rail Strategy: Surface Access to Airports study (October 2013).

These interventions were identified because of their key role in meeting our rail development objectives:

1. Maintain global competitiveness
2. Drive economic growth
3. Reduce impacts on the environment
4. Accommodate sustainable population growth.

Whilst our focus in this response is Crossrail 2, all three options should be prioritised for future investment because of their ability to meet these development objectives and drive economic growth in London and the South East.

In addition to this further investment is needed on Surrey's strategic road network, notably the A3 and M25. Investment on these roads would impact positively on regional productivity and support the labour market in both London and Surrey.

The need for investment in the region's strategic road network has been recognised by Enterprise M3, Coast to Capital, Solent and Thames Valley Berkshire Local Enterprise Partnerships, who have appointed consultants to identify, describe and quantify the economic case for improving connectivity in major strategic movement corridors across South East England (the Influencing Strategic Transport in the South East Study). The study will be made available to the National Infrastructure Commission once complete (at the end of January 2016).

Surrey County Council is working closely with the LEPs on this study. Given its strategic importance to the region the upgrade of the A3 between M25 Junction 10 and Portsmouth has been selected as a test corridor for the study.

Crossrail 2

Services along the SWML are already amongst the most overcrowded in the country notwithstanding the forecast rail growth of 40% by 2043. On suburban lines some

passengers are already unable to board the busier trains. Demand on these services is also forecast to increase by 40% by 2043.

We must take steps now to ensure that rail services and capacity are improved for our residents. Crossrail 2 is key to achieving these aims.

In the short term, Network Rail and South West Trains are addressing this challenge through small-scale capacity enhancements and train lengthening. This is welcome but a longer term solution is needed.

Crossrail 2 has the potential to benefit Surrey in two ways. It will provide:

1. New direct Crossrail 2 services, cutting journey times and improving connections to Central London, and
2. Additional longer distance services on the SWML providing additional capacity into Waterloo and reducing journey times.

Crossrail 2 will provide direct connectivity from Surrey to areas in Central London that currently require interchange. This direct connection will enable shorter journeys for many passengers, supporting the London and regional labour market. The Crossrail 2 Assessment has examined the proposed Crossrail 2 routes and also considered other potential route options.

The real benefit for much of Surrey will be through the additional capacity and crowding relief for services into London Waterloo. Additional train paths on the SWML could be used for additional long distance and/ or for shorter distance services. The Crossrail 2 Assessment sets out analysis of where this capacity would be of particular benefit for communities in Surrey, supporting economic growth and potentially encouraging housing supply.

Other infrastructure

Crossrail 2 is a key priority for the county council but there are other strategic schemes, equally transformative, which would strengthen the Surrey, regional and London economy. These include:

- The modernisation of the North Downs Line
- Improving access to airports
- Improvements on the A3 corridor and strategic road network.

These interventions, summarised below, recognise the need for balanced growth across the South East. London's strategic transport challenges can best be met by both improving connectivity to London but also ensuring that there is investment in infrastructure that will serve to release pressure on London's transport network.

Modernisation of the North Downs Line

The North Downs Line runs through Surrey, Hampshire and Berkshire between Reading, Guildford and Redhill. The line forms an important orbital route to the south and west of London, with connections to the capital.

The potential of this line is currently constrained by poor journey times and service frequencies. This has been recognised by Network Rail in the Wessex Route Study which proposes a much needed increase in service frequency.

There is a good economic and strategic case for investing in improvements along this line. Significantly, by providing an alternative route option around the capital, investment along

this corridor could free up much needed capacity in Central London by diverting passengers away from the capital.

Further, the catchment area along the corridor could play a critical role in achieving balanced growth in the South East. Population and employment is expected to grow strongly along the line, helped by major employment and housing developments.

We urge you to review Surrey County Council's assessment of the North Downs Line which outlines a long term vision for this corridor. This vision involves a series of improvements, driving economic growth at key strategic locations. In the short-medium term we are seeking:

- Investment at Guildford Station to increase platform capacity;
- Re-signalling and careful timetabling to maximise peak time travel opportunities;
- The extension of services beyond Reading to Oxford;
- The potential electrification of the remaining stretches of the line.

The detailed assessment can be found at www.surreycc.gov.uk/surreyrailstrategy.

Improvements on the A3 corridor

The A3 is an important strategic corridor linking Portsmouth and London. It is already significantly congested and this congestion is predicted to get worse. The A3 goes through Guildford, Surrey's largest employment centre and directly past Surrey Research Park. The research park is a nationally significant centre of excellence for technology, science, health and engineering and contributes £350 - £450 million to the economy annually.

Surrey County Council, Woking Borough Council and Guildford Borough Council completed a high level impact assessment of the A3 in the summer 2015. A summary of this study can be found in the attached A3 connectivity lobbying note.

The work on the A3 is being further taken forward through two strategic studies – the M25 South West Quadrant Strategic Study and the Influencing Strategic Transport in the South East Study (as noted above).

Improving journeys to Heathrow and Gatwick Airports along with the creation of additional runway capacity

The county council commissioned a study to examine the transport infrastructure improvements needed to address both existing surface access issues to the airports and the improvements needed to regional and local links in the event of additional runway capacity at Heathrow and/or Gatwick.

Amongst the options identified are a future direct rail access solution to Heathrow Airport from Surrey and ensuring medium term improvements to the North Downs Rail Line (as highlighted above). Improving these links will support both the Surrey and London economies.

Looking specifically at Heathrow, whilst rail access is relatively good from West London and the wider London area, from the south, including most areas of Surrey, there is little viable alternative to travelling to Heathrow Airport by car. Travel by car (47%) is the dominant mode for trips to Heathrow from Surrey, followed by taxi (38%). A significant number of Heathrow employees are also resident in Surrey, with over 80% travelling by car. Enhancement of public transport access to the airport from the south is therefore vital to improve connectivity to Heathrow for airport users and staff and to help mitigate congestion, achieve modal shift and minimise detrimental impacts on the local economy.

Whilst we support the principle of improved southern rail access, the optimal scheme for Surrey's residents or for that matter the residents of South East England as a whole, has yet to be identified. To this end we await the publication of Network Rail's study of the case and options for a southern rail access.

As part of this it is essential that the Government, Network Rail and other bodies are fully committed to funding the core and extended baseline of strategic road and rail improvements identified by the Airports Commission as needed to accommodate background demand in the absence of any new runway at either Heathrow or Gatwick to avoid unacceptable traffic congestion and overcrowding on train services. The funding of improved surface transport access to support airport expansion needs to be agreed up front whether it comes from Government, the airport owners or other agencies or in combination. There is therefore a need for binding commitments to fund related surface access enhancements through national and sub-regional programmes.

Our experience of the implementation of the T5 development proposals, however, indicates that if the components of the proposed surface access strategy are not formally agreed and secured through binding commitments, opportunities can be missed.

A copy of the Surface Access to Airports Study and the detailed analysis that accompanies it are available to download at <http://www.surreycc.gov.uk/environment-housing-and-planning/development-in-surrey/surrey-future/airports>.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

In recognition of the importance of Crossrail 2 to the Surrey economy the county council has recently commissioned an assessment of Crossrail 2, the objectives being to:

- Identify the optimum configuration of Crossrail 2 services for Surrey and the best use of released capacity; and
- Provide an evidence base for use when providing input and response to the Crossrail 2 design development and subsequent consultation process.

In identifying the optimum configuration of services, the assessment highlights opportunities to increase the benefits of the scheme and we urge you to review this report.

In terms of released capacity, additional station calls for fast trains at Guildford and Woking would serve existing demand at these stations (Surrey's busiest) and support growth forecasts. We also suggest new service calls at Byfleet and New Haw and Walton-on-Thames on the SWML and new services along the Alton Line because of growth potential along this corridor.

In terms of direct connections, we support the current proposals for Crossrail 2 connections in Surrey. Partly in recognition of growth potential we have asked Network Rail/ Transport for London to investigate the operational feasibility of an extended service beyond Epsom to Dorking and the operational implications of a service to Woking. Woking is a key economic centre in Surrey and a potential future rail hub. In addition, Woking could potentially be a key origin/ destination station for southern rail access to Heathrow Airport, which could lead to a range of growth opportunities being realised.

The full analysis is available to download at www.surreycc.gov.uk/surreyrailstrategy.

Supporting infrastructure

Additional supporting infrastructure is vital to ensure that the benefits of Crossrail 2 connectivity are fully realised. Public transport improvements will be needed to provide access to the stations benefiting from direct connections or increased capacity, particularly if we are to avoid an unsustainable increase in the demand for parking around stations. Parking is already a problem in some areas along the proposed route.

In addition to this we must recognise now and plan for the transport impact of the associated housing that Crossrail 2 will encourage. Whilst the aim would be to encourage as much travel as possible by rail, this will generally only serve a relatively small percentage of the overall travel demand from any new housing. Detailed Transport Assessments will need to be undertaken for any housing proposals that might be associated with Crossrail 2.

Other infrastructure will also be needed to support any additional development encouraged by improved connectivity. This includes the social, community and other services provided by the county council, notably education.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

- **What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?**
- **What innovative funding mechanisms could be considered to support delivery of key schemes?**

London and the South East should work together to define and promote a programme of cross - boundary transport investment that will provide mutual benefits.

You will be aware that Surrey, West Sussex and East Sussex have put forward an ambitious '3SC' devolution proposition of which a central element is to complete the infrastructure studies underway across the 3SC area and develop them into a prioritised programme around which investment and local planning arrangements can be structured. The intention is then to develop a comprehensive infrastructure strategy (and accompanying fund) to 2050 to provide a planned and prioritised investment roadmap for the area linking the delivery of infrastructure with the delivery of housing and employment sites.

We will be seeking some additional fiscal devolution as well as the ability to make better use of existing national and local funding. In combination these devolution proposals offer the means to do far more to secure the delivery of the local infrastructure needed in the area and including that needed to support major interventions such as Crossrail 2

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

No comments

National Infrastructure Commission: critical infrastructure challenges

Sustrans' submission on London's transport infrastructure

January 2016

Summary

Sustrans is a leading UK charity enabling people to travel by foot, bike or public transport for more of the journeys we make every day. We welcome the opportunity to respond to the National Infrastructure Commission's call for evidence on London's Transport Infrastructure. We are also responding to the Commission's call on Northern Connectivity.

Many of the apparent challenges facing London, northern cities and cities across England are similar in nature. Infrastructure investment can support the local and regional authorities in tackling them.

For London, improving economic productivity, maintaining competitiveness, protecting our environment and improving public health are key challenges faced by the city. Meeting these challenges is made more difficult by London's projected population growth, which will increase pressures on space, services and transport. Sustrans has ruled out increasing motor-traffic capacity as a strategic option due to its impact on congestion, public health and quality of life.

Sustrans consider that strategic options for investment include:

- modernising London's roads to cater for increasing demand from walking and cycling and to unlock suppressed demand for sustainable modes – improving the efficiency of the road network and its impact on quality of life;
- overcoming strategic barriers to walking and cycling, including major roads, railways and rivers – barriers that sever communities and economic opportunities (this includes specific proposals for a new bike bridge across the Thames); and
- integrating major public transport investment with improvements to cycling and walking connectivity.

This approach would help unlock a potential 4.3 million journeys (roughly 20% of all daily journeys) that could be cycled in London, alleviating significant pressure on London's roads, buses and railways, and lead to a significant shift in the number of journeys made by foot. Improving quality of life through modernising London's roads – catering for and unlocking walking and cycling - will be key to maintaining London's global competitiveness and its contribution to the national economy.

What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

The major economic and social challenges that face London over the next two to three decades are economic, social and environmental. They include:

Improving economic productivity – and maintaining competitiveness

- Ensuring that journey times do not deteriorate under the pressure of population and employment growth
- Reducing absenteeism from work against a backdrop of increasing sedentary, inactive lifestyles and rising obesity
- Managing congestion and competing demands for London's road space – both are critical to London's ability to attract investment and provide a good quality of life

Improving Public Health

- To dramatically reduce the number of people killed and seriously injured on London's roads
- To reduce air pollution and its impact on Londoners health - researchers at King's College London estimate air pollutants (particulate matter and NO₂) contribute to the deaths of nearly 9,500 people each year¹
- To improve physical activity levels through walking and cycling, helping to tackle a range of non-communicable diseases and obesity, reducing the burden on the health care system

Protecting our environment

- To reduce London's contribution to climate change

Meeting these challenges against a backdrop of rapid population growth

Each of the challenges above will be made more difficult by population growth. The result of growth will be to place ever greater demand on services, green space, infrastructure and the environment.

The population of London was 8.3 million in 2012.² By 2021, the Office for National Statistics project that the population of London will reach over 9 million, growing at a rate of 117,000 new residents per annum.³

Without action to plan and cater for this growth, London will struggle to maintain a good quality of life for its citizens – let alone improve it. Similarly, increasing pressure on public transport and roads will hold back the capital's productivity growth and its contribution to the national economy and global competitiveness.

Active travel (walking and cycling) can provide a significant contribution to overcoming these challenges. It has the potential to rival other forms of mass transit if catered for strategically.

Transport for London undertook analysis in 2010 to understand the potential contribution of cycling to meeting London's travel demand, looking at the short trips Londoners make during the day and without bulky loads. It identified 4.3 million journeys that are made by mechanised modes each day, such as by car, powered two-wheeler, bus or rail, that could be cycled. This represents a 23% share of trips made in London.⁴ Despite substantial recent growth cycling currently makes up just 2%.⁵ This stark contrast between the reality today and London's potential highlights the contribution cycling can make if catered for by road infrastructure.

Having recognised this potential and set a target of 1.5 million trips per day by bike, the Mayor of London is investing roughly a quarter (£913 million) of the £4 billion Roads Modernisation plan in creating a cycling network of the standard required to enable everyday cycling. Transport for

London calculated an overall benefit-cost ratio of 2.9:1 for this cycling investment.⁶ With further investment, London could cater for the 4.3 million journeys identified in the 2010 study. Maintaining long-term investment in improving road infrastructure for cycling, and also walking, over the next two to three decades will make a major contribution to meeting the major economic, social and environmental challenges outlined above.

What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

Directly increasing the road network is unsustainable

It is widely recognised that increasing road capacity generates more traffic, particularly in urban areas where congestion suppresses demand.⁷ The temporary benefits of a wider road and smoother traffic flow result in diverted journeys (people shifting their trips in time or route to make use of the new capacity) or induced travel (longer trips becoming more acceptable with better conditions on the road). This effect increases overall traffic levels, and increases it during peak periods until congestion returns to its original levels. The effect of this is to worsen congestion at other points on the network with no improvement to journey times or reliability.

When a second bore of the Blackwall Tunnel opened in 1966, traffic increased by over 100% – more than double the original use.⁸ The effect on congestion was negligible, as drivers who had previously avoided the route, driven at other times or not driven at all, quickly made use of the newly available space returning congestion to its original state.

That motor traffic grows because of increases in road capacity has been recognised since at least the SACTRA report on Trunk Roads and the Generation of Traffic in 1994.⁹ This report was released after almost a decade of road improvement projects that failed to reduce congestion - despite that being their objective. Increasing road capacity in London will have major negative effects, including:

- increasing the volume of traffic – resulting in deteriorating air quality, increased road danger and the severance of communities
- expediting congestion to other parts of the road network – generating new air pollution hot spots
- encouraging mode shift to private motor vehicles from public transport, walking or cycling or generating new trips entirely – reducing the efficiency of roads

It is important to note that average car ownership in London is much lower than elsewhere in the country. As the population has grown over the past decade, traffic levels have continued to decline (see figure 1). This is the result of significant and sustained investment in providing Londoners with travel choices: public transport, cycling and walking alongside constraints on private motor travel.

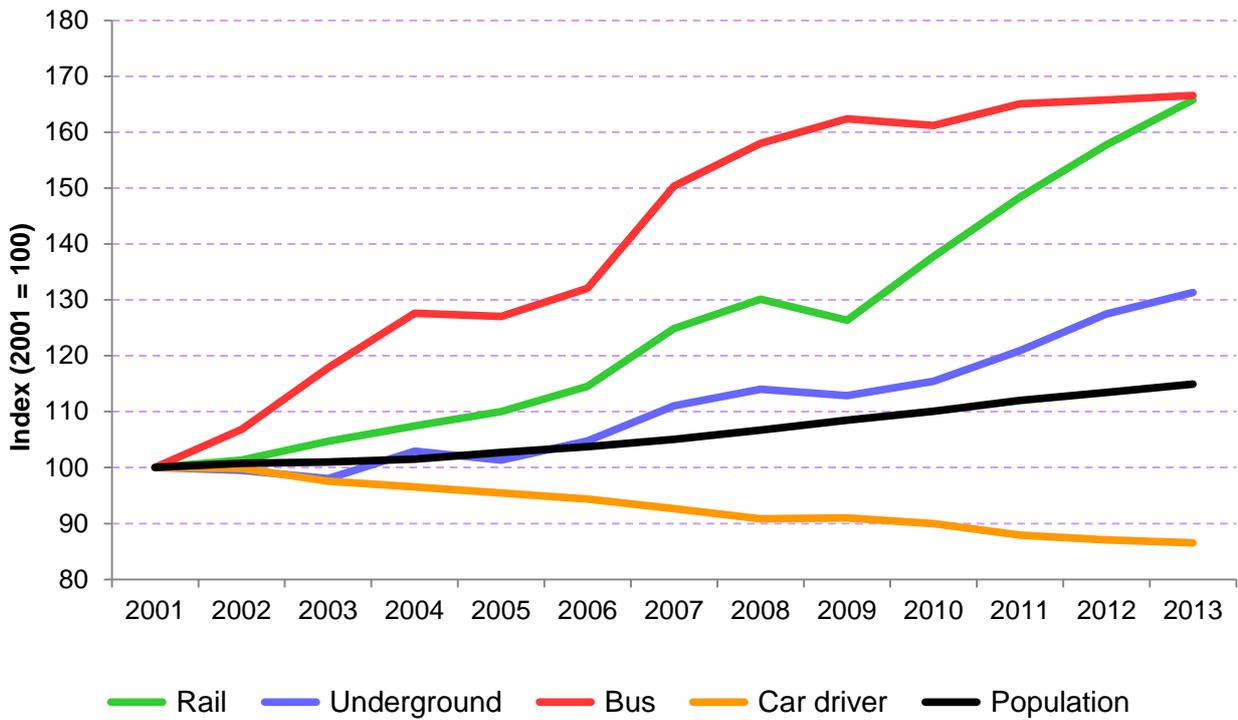


Figure 1: growth in journey stages on selected modes, 2001-2013 (Transport for London Travel in London 7)

There are a number of proposals to build new road capacity in London. Sustrans is firmly of the view that this will harm London’s economy, not grow it – increasing congestion, air pollution and road danger, damaging London’s productivity and quality of life.

Maximise the efficiency of the existing road network through walking and cycling

The majority of journeys are of walking and cycling distance, improving road infrastructure for these modes would make London’s road infrastructure much more efficient.

The way Londoners travel has changed dramatically over the past two decades but more needs to be done to continue this trend. The densification of London, particularly inner London, means that investment in a diverse range of non-car transport options has become viable, the range and quality of public transport pulling people to use non-car modes. Meanwhile congestion, the cost of motoring, restrictive parking policies and mix-use development has pushed people away from car use.

The scale of change is substantial. Department for Transport data shows that in 2013 private vehicle use in London reached its lowest point since 1993.¹⁰ Since 2000 there has been a ten percentage point shift away from private transport to walking, cycling and public transport. This has occurred against a background of a population that has grown every year since 1988, accelerating from the mid-1990s onwards.¹¹ The volume of road traffic in London has decreased 11% since 2001. Car driver trips are 13% lower, despite a 15% increase in London’s population over the same period.¹² The scale of change shows what can be achieved when policy and strategic infrastructure investment are aligned.

Cycling has grown dramatically and will continue to grow in future. Twice as many people are now cycling in London than in 2000. More people cycle now than use the Docklands Light Railway and London Overground combined.¹³ There was a 10% increase in cycling between 2013 and 2014 alone.¹⁴

The Transport for London study, mentioned earlier, identified 4.3 million journeys that are made by mechanised modes, but could be cycled. This represents a substantial 23% of the total 18.5 million journeys a day.¹⁵ While cycling has grown dramatically, particularly for commuting to central

London, it still makes up only 2% of journeys across Greater London.¹⁶ This potential remains largely untapped.

Walking is strategically important for London. At some point in a journey, everyone walks. Walk-all-the-way trips have grown in line with population growth. The increase in trips entirely made by foot from 2008 – 2013 was 9.3% - the same increase as population growth over the same period.¹⁷ However, short walking stages, as part of trips by public transport, have grown dramatically from around 2.8 million in 2006/7 to 4.2 million in 2012/13. Walking provides the link between all other modes as well as a key means to make local trips, but with a growing population the walking environment will deteriorate without sustained investment. In turn this may impact London's competitiveness as a place that attracts skilled labour and investment.

Active Travel (walking and cycling) has the potential to rival other forms of mass transit if catered for strategically. Sustrans consider there to be three routes to achieve this; each of which requires infrastructure investment.

1. A strategic network of cycle routes

Many complete journeys (door-to-door) could be made by bicycle - particularly those commuting within inner and central London, where the journey distances are easily cycled. According to TfL only 14% of cycling potential has been met in central London and 9 per cent in inner London.¹⁸ The Infrastructure Commission should recognise the important contribution to travel in London that cycling could make given the right road infrastructure conditions. Hence, the need for continued investment in a strategic cycle network, which provides safe and direct routes between homes, jobs and services. Major transport projects, such as Crossrail and Crossrail 2, should integrate with the cycle network and provide opportunities to expand and contribute positively to it.

Investment in new road infrastructure that is good for cycling is popular. Recent consultations by Transport for London and London Boroughs, for example, have drawn an overwhelming number of supportive responses. The most high-profile, "East – West Cycle Superhighway", on the Embankment received nearly 14,500 responses with a support rate of 84%.¹⁹ In an independent poll by YouGov, 64% of Londoners supported removing traffic lanes for cycle superhighways.²⁰

A strategic network of cycle routes is a vital ingredient to meet London's future challenges. The creation of a safe and direct network for cycling should be a goal of investment in London's road infrastructure over coming decades.

2. Overcoming strategic barriers to local journeys - including east London river crossings

Road, rail and water present obstacles to movement – they sever communities and create longer, more circuitous journeys than the crow flies. Journeys are concentrated onto bridges and tunnels available, which, for people on foot or on bikes, often means sharing with high volumes of traffic. Consequently, they are danger hot spots with poor air quality. Providing strategic crossings for walking and cycling can unlock suppressed demand by providing advantageous journey times to other modes and a much more pleasant environment to travel in. This improves local journeys times and quality of life, through healthier journeys and better places.

2.1. A new bike bridge for London: improving connectivity to jobs and cross-river journey times

As the Commission will be well aware, the river Thames presents a major barrier to development in east London. Crossings are few and far between compared to west London. For the crossings between south London and the Isle of Dogs there is a specific existing demand that far exceeds capacity.

This demand will only increase. Over the next two decades at least 110,000 new jobs will be created on the Isle of Dogs and at least 4,000 new homes will be built immediately across the river at Canada Water.²¹ Furthermore, major growth is planned around six 'Opportunity Areas' in south London within close cycling distance of the Isle of Dogs and its growing job opportunities.

In 2008, Sustrans proposed a new bike bridge between Rotherhithe and the Isle of Dogs. The bridge is highlighted in HM Treasury's National Infrastructure Plan. Described as, "[a]n interesting proposal made by Sustrans, and worth looking at in more detail, would be a new pedestrian and cycle bridge from Rotherhithe to Canary Wharf."²²

With support from Transport for London and local businesses, we revisited the case for a bridge in this location in 2015. Using an example design, our feasibility study and outline business case analysis suggested a likely benefit-cost ratio of 2.6:1 with a base cost of approximately £88 million. Further development work is needed to identify the detailed business case and feasibility (further information is presented overleaf).

Providing cross-river connectivity in east London is vital and a walking and cycling bridge between the Isle of Dogs and Canada water could make a nationally significant contribution between strategically important development sites for new homes and jobs in London.

3. Integrating walking and cycling with public transport

Major public transport schemes, such as Crossrail and Crossrail 2, have the potential to dramatically increase rail capacity in London unlocking new housing sites and new areas of focus for employment growth while potentially alleviating pressure on national rail services. However, the benefits of these projects will be limited in scope if they fail to unlock local walking and cycling potential. Providing accessible walking and cycling links to stations, as well as interchange facilities – such as cycle parking – will ensure that new or improved stations benefit the largest catchment area possible.

How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?

The criteria for the prioritisation of schemes should be weighted according to the strategic challenges set out in response to the first question and to what extent they tackle the challenges. Importantly, the environmental and social impacts should be considered with equal weighting to economic impacts.

Significant priority should be placed on maximising the efficiency of the road network – particularly through providing infrastructure for cycling and walking for short journeys, where there is significant potential. Through a strategic cycle network, greater capacity is provided for short trips from London's finite road space.

Cycles are able to make much more efficient use of road capacity. While a car occupies one passenger car unit (PCU) of road space to convey on average 1.3 people, a bicycle occupies 0.2 PCU to convey one person. In other words, a cycle uses a fifth of the space of a car to transport the same number of people. Transport modelling in the Netherlands suggested that given the same space, buses could convey 9,000 people per hour, while cycles could convey 14,000.²³

With London's population continuing to increase, the space efficiency of road based transport schemes should be a major consideration for their prioritisation. It should also take into account the flexibility and resilience of walking and cycling to disruptive events.

What might their potential impact be on employment, productivity and housing supply in London and the southeast?

1. Strategic Cycle Network

Increasing productivity through quicker journey times: for many short journeys in London, cycling is the fastest mode of travel. TfL have estimated a daily value of time saved if the Mayor's cycling target is reached to be in the order of £530,000 a day or £190 million a year.

Increased spending power: cycling is the cheapest mode of travel after walking. TfL estimate that those who will cycle regularly in London as a result of investment in the cycling network will collectively save £190 million per year.²⁴

Increasing productivity by improving health: People who cycle regularly take 1.3 fewer sick days than those who don't. TfL have calculated that reaching the Mayor's current cycle target of 1.5 million cycle journeys per day will provide £30 million in savings to businesses each year, through increased productivity. Reducing mortality through exercise (physical activity) as a result of 1.5 million cycle journeys in London is estimated to save the NHS, care services and others £183 million each year.²⁵

2. A new bike bridge for London: improving connectivity to jobs and cross river journey times

Sustrans' work on the development of a feasibility study and outline business case for a cycling and walking bridge between Rotherhithe and Canary Wharf has highlighted that a bridge in this location would:

Provide a significant contribution to active travel in London, connecting new homes and new jobs

- Cater for at least 10,200 cycle trips per day – the equivalent capacity of 10 full Jubilee line trains or 127 buses
- Cater for 3,400 cycle crossings during the AM peak – as busy as other central London bridges for cyclists
- Put the growing population of the Rotherhithe peninsula within walking distance of the Isle of Dogs

Have far reaching benefits

- Reduce crowding on the Jubilee Line – currently at the highest measure of crowding during the AM peak (over 4 people per square meter) between Waterloo and Canary Wharf²⁶
- Uplift land values in the surrounding area by c10% according to previous examples
- Negligible emissions

Provide value-for-money

- Monetised benefits circa £10 million per annum, including journey time savings of £7.9 million
- Full project cost c£200m
- Benefit-cost ratio c2.6:1
- Buildable by 2020, following a full and transparent procurement process

3. Maximising walking and cycling benefits through Public Transport

3.1. 'Cycle-proof' new stations, railways and above-station developments: 'cycle - proofing' involves ensuring that structures, buildings and streets are safe and attractive for cycling. Public Transport works should improve cycle and pedestrian access to and from stations within the catchment area (approx. 5km), and enhance permeability through the site. Provide interchange facilities, such as cycle parking, for cycles of all types (including non-standard cycles, such as hand-cycles or tricycles) to cater for growth in mode share and a diversity of users. Overcome local barriers to cycling, including major junctions or physical severance caused by road, rail or waterways. Crossrail delivery should include the redesign of such junctions, and construction of new infrastructure to overcome severance such as bridges or new crossings.

3.2. Increasing housing supply through cycling: the current Public Transport Accessibility Levels (PTALs) tool provides the framework for maximum housing densities in London. Overcoming barriers to walking will improve the transport accessibility rating of areas and therefore increase their potential contribution to housing supply. PTALs do not currently include cycling access. As a general rule, including cycling in accessibility scores will increase the accessibility of an area and thus its potential housing supply. For the scores to reflect the reality, however, the developers should improve the cycling connections to and from their site, without which any modifications to accessibility scoring to take account of cycling may not be a fair reflection of perceived accessibility by bicycle. Ensuring new developments – particularly those linked to new transport, such as those unlocked by Crossrail 2 – should address barriers to walking and cycling in and around the sites. This will improve transport accessibility and thus increase potential housing supply in the surrounding area.

What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Maximising the benefits by prioritising cycle connectivity

The planning and construction of Crossrail 2 is an opportunity to offer door to door sustainable travel options for the growing London population. Central to this will be the connectivity for cycles and pedestrians to and from stations and through the sites. To make the most of this opportunity, the Crossrail 2 project must be an exemplar of integrated and accessible station design and master-planning, particularly focussed around walking and cycling.

By actively improving local cycle connectivity, Crossrail services will become more accessible across a larger area, improving the catchment area and thus likely ridership of the scheme.

What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

- What innovative funding mechanisms could be considered to support delivery of key schemes?

Vehicle Excise Duty: In the spring budget, the chancellor announced that he would be engaging devolved administrations on the allocation of revenue derived from Vehicle Excise Duty. There is

likely a large contribution that can be made to Transport for London in general, or on a scheme by scheme basis, from vehicle excise duty contributions in London.

Mayoral Community Infrastructure Levy: The Mayoral Community Infrastructure Levy (MCIL) was established to contribute toward the cost of Crossrail. Together with the section 106 agreement, development in London is expected to contribute c£600 million to the c£15 billion cost of Crossrail through MCIL. Sustrans consider that the MCIL should be utilised to improve walking and cycling access to new development sites and new Crossrail and Crossrail 2 stations.

Ensuring developments provide high quality walking and cycling links: swathes of London will be unlocked for development as a result of Crossrail 2 and other strategic public transport projects. With developments carrying out master planning and street works as part of their developments, ensuring that they deliver a high quality of design for walking and cycling will be a key means to add-value to London's accessibility and connectivity. The London Plan provides a good policy framework for this to take place and the GLA and Transport for London are equipped with the skills and expertise to provide best-practice guidance. Planning frameworks surrounding Crossrail stations should prioritise improvements to local streets for walking and cycling as part of their development. This would add value to Crossrail stations and development sites without extra cost.

How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

Many global cities are taking bold steps toward more sustainable transport systems. Of those cities with similar populations, Paris and New York are developing strategic cycle networks, while also creating new public spaces from their roads.

- The New York City Bicycle Masterplan outlines 900 miles of planned network. Cycle commuting in New York is on course to have tripled over the ten years from 2007 to 2017. The exemplary project of new public space is Times Square. It is now a bustling pedestrian plaza where it had previously been a car dominated interchange.
- Paris has similar aspirations to triple the share of trips by bicycle by 2020 – to 15% share of trips, enabled by a 1,400km network of routes by 2020. A number of new public spaces have been created from traffic interchanges, most famously La Republique, which is now the largest pedestrian square in the city.

Many of these strategies have been adapted from those developed in smaller cities, such as Copenhagen, Amsterdam, Seville, Cambridge and pioneering Cities of Latin America, including Bogota and Medellin. Each have focussed on improving the overall mobility of the city (integrated travel, rather than mode specific improvements) and on quality of life.

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National Infrastructure Commission Call for Evidence, January 2016

London's Transport Infrastructure

Submission from Thales UK

Thales is a global technology leader for the Aerospace, Transport, Defence and Security markets. With 61,000 employees in 56 countries, Thales reported sales of €13 billion in 2014. With over 20,000 engineers and researchers, Thales has a unique capability to design and deploy equipment, systems and services to meet the most complex security requirements. Its unique international footprint allows it to work closely with its customers all over the world. Thales UK employs 6,500 staff across 11 key locations.

Thales welcomes the formation of the National Infrastructure Commission and is pleased to contribute through this call for evidence. Long term integrated planning of jobs, homes, infrastructure and transport is essential for the future competitiveness and productivity of the UK.

This paper aims to address the questions raised in the National Infrastructure Commission's Call for Evidence dated 13th November 2015 in section 3 relating to London's Transport Infrastructure and specifically focuses on questions 1, 2 and 5.

With the forecast increase in population and travel demand, Thales believes that one of the key challenges for London's Transport infrastructure will be the demand on capacity. To address this challenge, investment in innovative modernisation programmes of existing infrastructure, in addition to major new infrastructure schemes, is necessary. Creating capacity through modernisation programmes can provide a more immediate impact on the economy by enabling growth in housing and jobs, as well as generating improvements for passengers and productivity through faster and more reliable journey times.

It should also be recognised that although modernisation programmes often provide very favourable benefit to cost ratios, their impact is not always recognised in the wider political and public domain. Addressing this by providing a narrative of the importance of continual upgrade and improvement, the benefits it brings both to the economy and the passenger journey (rather than the disruption), as well as the value of the supply chain it supports would be a positive step.

Q1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

- 1.1 London's population is forecast to rise from 8.6 million to 10 million by 2030 and 11.3 Million by 2050 with demand for public transport forecast to rise by 50%, with demand for the underground expected to rise by 60% and mainline rail by 80%¹. Severe crowding on the Tube is forecast to double by 2041. It will be increasingly difficult to support passenger growth, operational reliability, efficiency and comfort expectations with the limited and ageing infrastructure capacity that we have available today.
- 1.2 Approximately 80% of daily passenger journeys in London occur on the road network, either by car, taxi, bicycle or bus. London's buses currently carry over 1 billion more passengers than the London Underground and account for nearly half of all the bus journeys made in England. TfL forecast an additional 1.25 million additional daily trips on the Capital's roads by 2018 with the forecast cost of associated delay being two and a half times its current level by 2031².
- 1.3 National Rail in the South East is also suffering from increasing capacity issues. Demand for National rail services into Waterloo is set to increase by 40% by 2043. Today, almost 30% of passengers arriving at Waterloo in the morning peak have to stand.
- 1.4 With regards to London Underground, the London Infrastructure Plan 2050 highlights that even with the current plans for modernising the London Underground Network and opening Crossrail 1, the network will be full by 2030 and further capacity will be required. The Plan indicates the potential for mainline rail to carry twice the number of passengers as at present.
- 1.5 In addition, the gap is widening between North and South London with respect to tube capacity and quality of service. London has 242 underground stations north of the river and 28 stations south of the river. Residents North of the river are more likely to enjoy the modernised tube services at intervals of 1-2 minutes whereas South of the river suburban services will be a lot less frequent and tend to be less reliable.
- 1.6 Reliability of journey time is the most important factor for passengers when choosing trains over alternative modes of travel³. In addition, the frequency of trains is a key consideration in the decision to travel by rail. If unaddressed, increasing issues with capacity may make commuting to and travelling in London less attractive to the customer, potentially having a negative economic impact and limiting London's potential for growth.
- 1.7 As such delivering additional capacity on radial routes to new centres such as Stratford, Canary Wharf and Old Oak common will be key to ensuring the success of the newer growth areas.

¹ London Infrastructure Plan 2050, Mayor of London

² Transport for London, Finance & Policy Committee, Surface Intelligent Transport System, 20 July 2015

³ Office of Rail Regulation, Rail Passenger Experience Report, April 2014

- 1.8 The relationship between housing and transportation will become increasingly important in safeguarding London's growth in the next 20 years. Integrated planning is essential in order to ensure that the value is released from land around stations to contribute to the cost of transport infrastructure. It is important that transport focuses on opening up areas for growth and that growth in the economy and housing are taken into account when deciding on transport priorities.
- 1.9 The changing nature of passenger habits and expectations is also a significant consideration. Initially this may mean customers will increasingly wish to be connected whilst travelling, expecting high capacity data services to be available on the underground as well as the Overground. Passengers increasingly use data services to plan travel journeys and rely on these services in times of disruption. Customer Information can facilitate maximising capacity on the network, both when the network is running smoothly and especially in times of disruption.
- 1.10 In the longer term the way in which transport is undertaken will be disrupted through sharing economy models, on demand and multi modal transport and autonomous vehicles. These new technologies and business models have the potential to provide many benefits to London's transport system, including reducing road traffic injuries, optimising road capacity and extending access to those with mobility difficulties. They also present challenges from a city management perspective, ranging from a free market approach to ownership and usage to a centrally controlled model.⁴
- 1.11 Along with regulatory and cultural issues, increasing interconnectivity and automation, both on road and rail, has the potential to increase the threat to the security of the transportation systems through cyber-attack. The reputational effect of a maliciously controlled transport accident could be significant. Industry and transport service providers will therefore need to prepare for this increased risk and ensure it is considered as a priority when designing and implementing transportation systems which may be susceptible to this threat.

Q2 What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

- **How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?**
- **What might their potential impact be on employment, productivity and housing supply in London and the southeast?**

2.1 London now has the Mayor's Transport Strategy and the London Infrastructure Plan 2050, which need to be funded and delivered. With the forecast increase in population and travel demand it is clear that just upgrading existing infrastructure will not be enough to meet the demand forecast beyond the next ten years.

⁴ London Infrastructure Plan 2050, Mayor of London

2.2 It is therefore essential that a balance be struck between delivering cost effective improvements to existing infrastructure now and starting to invest in the major schemes, such as Crossrail 2 which will be to meet the capacity demands beyond 2030.

2.3 London's transport system makes a key contribution, not only to the productivity of the capital, but also to jobs across the UK with 60% of Transport for London's supply chain being outside London, supporting 60,000 jobs.

2.4 As the work that Thales has done in partnership with London Underground relates to existing infrastructure we have set out below the benefits that we believe could be achieved by extending this approach to other projects.

2.5 Delivering Transport Capacity for Growth – progress to date

Capacity

2.5.1 Thales UK, in partnership with London Underground has upgraded the Jubilee and Northern lines. New signalling on the Jubilee line has allowed 30 trains per hour every hour, carrying 12,500 extra passengers an hour. The Northern line signalling system has also been modernised, delivering up to 20% more capacity or space for an additional 11,000 customers per hour. Similarly, the Victoria line has been upgraded by LUL to 33 trains per hour.

2.5.2 The Four Lines Modernisation (4LM) programme to upgrade the sub-surface network is now in progress and will increase capacity on 40% of the network by a third. TfL's business case analysis confirmed a strong case for investing £2.5Bn in 4LM with the overall programme demonstrating a Benefit-Cost Ratio of 4.7 to 1.⁵

2.5.3 Whilst the Northern and Jubilee line have been upgraded, there is still more to be achieved, to meet increasing passenger demand. The world class capacity programme aims to increase the number of trains per hour on these lines to take full advantage of the benefits that can be realised from the newly installed signalling and control systems and additional trains. This enables people to access the highly productive employment centres in central London and ensures that London Businesses can compete on an international stage to attract the best talent.

2.5.4 TfL's business case analysis for the Jubilee line world class capacity programme gives results, based on reduced average journey time of 7.7:1 for the preferred option to raise the number of trains per hour from 30tph to 36tph, with an investment of £253M⁶. For the Northern Line Upgrade, the BCR is 4.4:1.

2.5.5 The benefit generated by these programmes is summarised in table 1 below

⁵ Transport for London, Finance & Policy Committee, Modernisation of the District, Metropolitan, Circle and Hammersmith & City Lines and Automatic Train Control Contract, 17 June 2015

⁶ Transport for London, Board item 10, Jubilee Line World Class Capacity, 5 November 2014

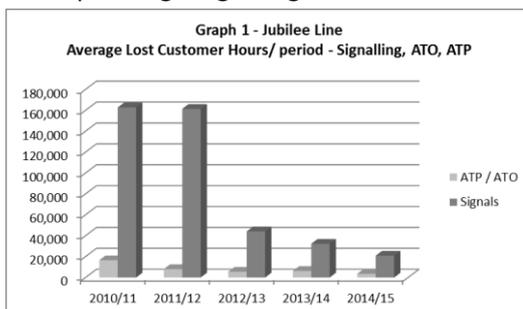
Line	% increase in line capacity	Trains per hour	Additional Customers/hour	Date
Jubilee Line	22%	30	12,500	2012
Northern Line	20%	24 on both branches during AM peak	11,000	2014
Jubilee Line World Class Capacity	20%	36		2019
Northern Line extension		28		2019
Northern Line Upgrade 2		30 on both branches		2021
District	24%			2021-23
Met	27%			2021-23
Circle	65%			2021-23
H&C	65%			2021-23
Crossrail 2	-	Up to 30	90,000	2030

2.5.6 The Jubilee line extension is a good example of how projects with a low BCR, if coupled with economic development areas and housing can completely transform an area, such as Canary Wharf. This experience indicates that projects should be assessed on their ability to pay back the original investment, including the project’s ability to create jobs, grow the economy and generate new tax receipts. This would give a more realistic view of the benefits of infrastructure investment and support investment not just in London but in other cities around the UK too.

2.6 FASTER & MORE RELIABLE JOURNEY

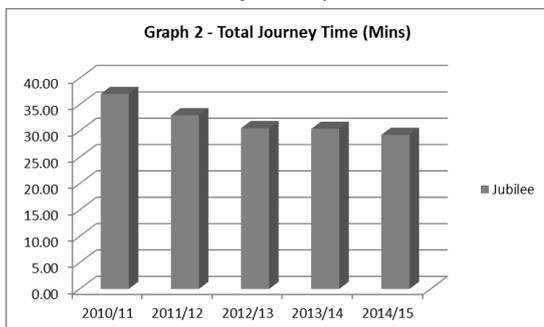
2.6.1 In addition to providing additional capacity, the upgrade programmes have also provided faster and more reliable journeys for passengers⁷. The following paragraphs use the Jubilee line as a case study to provide evidence of the performance improvements achieved by investing in modernising existing infrastructure.

2.6.2 Since the new signalling systems have been introduced on the Jubilee line the number of Lost Customer Hours attributed to Signalling, Automatic Train Operation (ATO) and Automatic Train Protection (ATP) has decreased by a factor of 7 as shown in graph 1 below, resulting in more passengers getting to their destinations on time.

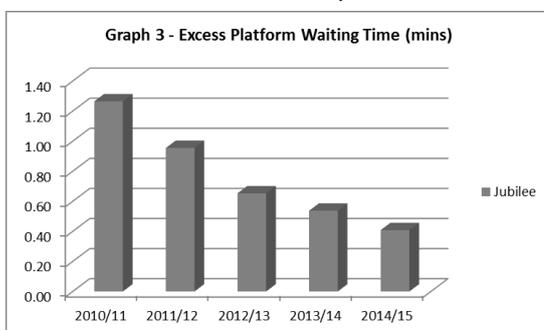


⁷ London Datastore, LU Performance Data Almanac

2.6.3 For passengers the Total Journey times have been reduced by around 13% with around 5 minutes being saved on the average journey per passenger as shown in graph 2 below. This is as a result of faster journeys as well as increased reliability of the line.



2.6.4 With an increased number of trains per hour, the next train arrives much sooner for a passenger waiting at a platform. The Platform waiting times on the Jubilee line are down from 0.81 in 2011 to 0.41 in 2014/15 2013.



2.7 Delivering Transport Capacity for Growth – Plans in progress but not yet fully funded

2.8 Rail

2.8.1 New Tube for London (NTfL) will be needed to deliver additional capacity on the Piccadilly, Central, Bakerloo and Waterloo & City Lines to support the 1.6 Million forecast growth in the London population by 2030.

2.8.2 TfL’s business case analysis confirms a strong case for investing £9.86Bn in NTfL with the overall programme demonstrating a Benefit-Cost Ratio of 4.2 to 1⁸.

2.8.3 The first stage in the programme plans to upgrade the Piccadilly line at a cost of £3.86Bn to deliver an additional 60% additional capacity. The Piccadilly line forms a vital link from central London to Heathrow and currently serves 210 million customers a year with demand expected to grow 20% by 2020⁹. In the London Chamber of Commerce 2014 business survey, 42% of

⁸ Transport for London, Finance & Policy Committee, New Tube for London Programme – Delivery Stage: Design & Specification, 23 Jan 2014

⁹ <https://tfl.gov.uk/campaign/tube-improvements/the-future-of-the-tube/new-tube-for-london>

businesses surveyed rated the Piccadilly and Bakerloo line upgrades as very important in addition to 44% considering Crossrail 2 very important for coping with population increases¹⁰.

2.8.4 The benefit that could be generated by these future programmes is summarised in table 2 below:

Line	% increase in line capacity	Tph	Additional Customers/hour	Date
Piccadilly	60%	33	19,000	2025
Central	25%	33	12,000	2030
Bakerloo line	25%	27	8,000	2033
Waterloo & City	50%	30	9,000	2032

2.8.5 Crossrail 2 will need to be approved and started by 2020, adding 10% to London's rail capacity. Crossrail 2 is expected to unlock land for up to 200,000 new homes and 200,000 jobs, adding up to £7.9 billion per annum to London's GVA and growing the national economy¹¹.

2.9 ROADS

2.9.1 A similar approach should be taken for Roads, to ensure that we maximise the capacity and performance of existing infrastructure. Road traffic can be managed in a similar way to rail traffic to maximise capacity and reduce journey times.

2.9.2 TfL is currently proposing Surface Intelligent Transport System to deliver £1Bn benefit to road users by 2036 through reduction in delays using predictive signalling at a BCR of 5:1.

2.10 Delivering Transport Capacity for Growth – Ideas for the Future

2.11 RAIL

2.11.1 By the 2020s the tube will be full, even with the planned capacity upgrades and Crossrail 1. Additional capacity must be released from the mainline rail network, by upgrading existing infrastructure, particularly in areas such as South London, in addition to progressing new infrastructure projects such as Crossrail 2.

2.11.2 Thales has been working with Centre for London in recent months to contribute to a research study called Turning South London Orange. The work aims to demonstrate how South London services could be transformed to deliver additional capacity and a reliable service to Londoners, by following a model similar to the London Overground. Many of the South London mainline stations are currently under-utilised, for example, at Brixton on the Victoria

¹⁰ London Chamber of Commerce and Industry, London Demands, The Business Agenda for General Election 2015

¹¹ Crossrail 2: Regional and National Benefits, September 2015

line there are over 29 million entrances and exits per year¹², but at Brixton Overground station just one million¹³. Many South Londoners travel miles by bus, past mainline stations, to get the tube at Brixton.

- 2.11.3 The report which is planned to be published in January 2016 could provide valuable evidence to the National Infrastructure Commission by setting out the expected impact of the additional capacity on home building and economic activity in the area.
- 2.11.4 The experience gained from improving the standard of service on the London Overground shows passenger numbers increased from 0.6 million journeys/ week in 2007 to 2 million journeys per week by late 2011, with this success being attributed a major infrastructure upgrade to deliver increased train frequency, new trains, station enhancements and service quality enhancements¹⁴.
- 2.11.5 The contribution that Thales has made to the Turning South London Orange study shows the potential to reduce delay on the suburban network by around 10-20% by deploying modern traffic management systems. Further benefits would then be gained if the area was re-signalling to modern standards including the European Train Control System and Automatic Train Operation.
- 2.11.6 Network Rail's plans for the Digital Railway adopt a similar approach by using modern state of the art signalling and control systems to increase the capacity and performance of the existing network.
- 2.11.7 Network Rail are certainly not alone in this thinking, in mid December, SBB, the infrastructure manager for Switzerland's railways published a strategy for its 20 year signalling vision, including many of the same concepts.

Q3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Q4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

- **What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?**
- **What innovative funding mechanisms could be considered to support delivery of key schemes?**

¹² London Datastore, multiyear station entry and exit figures for 2014, Transport Planning Strategy & Service development, June 2015

¹³ Office of Rail Regulation, Train Station Usage, December 2015

¹⁴ Transport for London, Rail and Underground Panel, London Overground Impact Study, 16 November 2011

- **What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?**
- **What innovative funding mechanisms could be considered to support delivery of key schemes?**

4.1 Thales contributed to the London First February 2014 “Funding Crossrail 2” report which can be found at http://londonfirst.co.uk/wp-content/uploads/2014/02/LF_CROSSRAIL2_REPORT_2014_Single_Pages.pdf

Additional and updated material on funding is also available at the end of the ‘Crossrail 2 – regional and national benefits’ document which is available at <http://crossrail2.co.uk/why-crossrail-2/>

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

5.1 Thales has worked with other major metropolitan areas in other countries faced by similar challenges. In particular, the lessons learnt in Tokyo, Hong Kong and China could provide insight which is of interest to the National Infrastructure Commission. Please note the metro infrastructures in these cities are younger than the ones in London.

5.2 Hong Kong

5.2.1 With the high reliability and availability of the metro service and area coverage of the metro network, the percentage of Hong Kong citizens relying on Hong Kong MTR metro network for traveling has been increasing rapidly. Today a high percentage of residents and tourists are relying on MTR.

5.2.2 Understanding the keeping in good state repair and modernization of existing metro lines takes longer duration due to limited night accessible time, MTR plans re-signalling/modernization project approximately at a 20-25 years interval.

5.2.3 MTR has recently let a major resignalling project for 7 lines (134 km, 73 stations, 158 trains). They decided to deploy one train control solution for all lines in order to simplify project implementation, operation management and skilled operation and maintenance resources.

5.3 China

5.3.1 With moving block signalling, suitable physical guide way and turn backs, in China they have been able to increase the number of trains and passengers. For example: the 50 km Beijing Line 4, currently is delivering approximately 1.5 million passengers daily with headway lower

than 90 second and the 66 km Guangzhou line 3 is delivering 1.3-1.5 million passengers a day with potential to deliver more.

- 5.3.2 In general all metro lines in Shanghai are relatively new compared to lines in London. The first line to be re-signalled in Shanghai is Line 5. To achieve capacity increase, passenger growth and area coverage, mitigate migration risk and reduce the requirements for night access, Shanghai city and Shanghai metro synchronized the timing for constructing extension (17 km extension added to a 17km existing line), adding new fleet of trains (32 6-car trains in addition or to replace the existing 17 4 car trains) and constructing new equipment rooms on the existing lines. The project is to be completed in less than 4 years.

5.4 Japan

- 5.4.1 The experience in Japan has shown that by connecting high speed to commuter and high density metro, in addition to building infrastructure at the connection stations (Shinagawa for example), then massive growth and development will follow. This can be seen also along the high speed lines.
- 5.4.2 Metro services are planned to be ideally within a 5-7 min walking distance from most points in the city – drastically reducing traffic congestion within the city.
- 5.4.3 Metro is looking at minimizing all wayside / maintenance to concentrate on the passenger services with minimal labour
- 5.4.4 The long term future that JR East and other operators are driving towards are larger interconnectivity between high-speed, sub-urban and metro areas – possibly towards implementing a seamless connection from low to high density traffic on the same line/train.



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[\[contact redacted\]](#)

8 January 2016

Dear Sir

Call for Evidence: National Infrastructure Challenges

In response to the Commission's call for evidence dated 13th November 2015, please find attached a submission from the Thames Gateway Kent Partnership (TGKP). This covers two of the three topics included in the call for evidence:

- Connecting northern cities
- London's Transport Infrastructure.

Our submission draws the Commission's attention to the importance of connectivity to, as well as between, northern cities. The Channel Ports to M25 corridor, through the Thames Gateway, has a crucial role in connecting the Midlands and North of England to international markets and supply chains, and a holistic approach is needed to infrastructure investment to ensure that corridor can deliver both the capacity and resilience to sustain forecast growth.

We welcome the Commission's focus on the economic and social challenges facing London and its commuter hinterland. The Thames Gateway provides the greatest potential to support London's growth as well as regionally and nationally significant economic opportunity in its own right. There are key transport infrastructure investments required to fulfil that potential, in particular the need for enhanced rail network capacity in North Kent and South East London. Extension of Crossrail 1 from Abbey Wood to Gravesend could be part of the solution. We invite the Commission to engage with the outcomes of work being led by Transport for London and sponsored by TGKP and other partners regarding the business case for such an extension.

I trust this paper will assist the Commission and we would be happy to discuss further.

Yours faithfully

Rob Bennett, Chairman, Thames Gateway Kent Partnership

National Infrastructure Commission – Call for Evidence

Submission by the Thames Gateway Kent Partnership

1. The Thames Gateway Kent Partnership (TGKP) is a public-private partnership, established in 2001, that promotes sustainable economic growth and regeneration in North Kent.
2. TGKP has a direct interest in the second topic on which the Commission is calling for evidence, and indirect interest in the first. The purpose of this submission is both to draw the Commission's attention to issues and evidence from the Thames Gateway pertinent to the Commission's programme, and to underline the continuing importance of the Thames Gateway itself as a national priority for infrastructure investment, to inform the Commission's advice to Government.

The Thames Gateway

3. The Thames Gateway originated from the "East Thames Corridor" development capacity study carried out for the then Department of Environment in 1991-93. The Gateway's status as a priority area for growth and regeneration was formalized in Regional Planning Guidance 9a "The Thames Gateway Planning Framework", and subsequently reflected in the South East Plan and numerous Government strategy documents and delivery plans.
4. Up until 2010, successive Governments invested in substantial investment programmes in the Thames Gateway, working through local delivery vehicles including development corporations for London Thames Gateway and Thurrock and, in North Kent, the Kent Thameside Partnership, Medway Renaissance and Swale Forward. In Kent, these major investments included the creation of Ebbsfleet International Station and HS1, the A249 Sheppey Crossing, A2 widening and re-alignment between the M25/J2 and M2/J1, the Universities at Medway campus at Chatham Maritime, and major brownfield land regeneration schemes such as Rochester Riverside, St Mary's Island, Queenborough & Rushenden and Northfleet Embankment.
5. The Coalition Government abolished the Regional Development Agencies and Regional Planning frameworks in 2011 and the remaining delivery vehicles and dedicated programmes were also wound up. But the Thames Gateway continues to enjoy Government support as a strategic initiative: it is a specific responsibility of DCLG Minister Rt Hon Mark Francois MP, and is overseen by the Thames Gateway Strategic Group, chaired by Sir Edward Lister (Deputy Mayor of London) and attended by the Thames Gateway Minister and business and political leaders from across the Gateway.
6. The Thames Gateway remains the most significant opportunity for transformational growth in London and the South East. Current and emerging plans identify potential for 270,000 new homes and 360,000-390,000 new jobs in the years to 2031. The Thames Gateway reflects a long-term vision to re-focus London's economic future towards the east and support the Capital's role and status as a global city. Private and public Investment in the Thames Gateway has continued, the latter including the prioritization of Local Growth Funding by the South East Local Enterprise Partnership.
7. But the Thames Gateway is about more than jobs and homes: it is also the chief corridor that connects London, the Midlands and the North to continental Europe. The prospects for London, the 'Northern Powerhouse' and 'Midlands Engine' and their access to goods, services, supply chains and markets depend crucially upon getting the right infrastructure investment into the Thames Gateway and into Kent and Medway as a whole.

Connecting northern cities

8. In this section we focus on two of the questions posed by the Commission regarding connectivity between northern cities:

3. Which city-to-city corridor(s) should be the priority for early phases of investment?

4. What are the key international connectivity needs likely to be in the next 20-30 years in the north of England (with a focus on ports and airports)? What is the most effective way to meet these needs, and what constraints on delivery are anticipated?

9. We understand that the main thrust of the Commission's investigation is about corridors and connectivity in the north. We suggest, though, that it is important for the Commission to consider connectivity to the north, particularly the corridor that connects the UK to its main European neighbours and continental markets. Of primary concern to this Partnership, and to the Thames Gateway, is the corridor from the Channel ports via the existing Dartford-Thurrock crossing that connects the north, Midlands and East of England to continental Europe. This is critical both to the national economy and to the future growth, regeneration and prosperity of the Thames Gateway.

Pressures within the Thames Gateway

10. Population, housing and economic growth in Thames Gateway Kent will increase pressure on the strategic roads network, particularly the A2/M2 corridor serving key locations such as the new Ebbsfleet Garden City. The proposed London Paramount Entertainment Resort (see paragraph 29) will, subject to approval, also add significant visitor and workforce journeys onto both the strategic and local roads (and rail) networks.
11. Analysis of DfT statistics¹ show that motor vehicle traffic in Kent has already grown by 24% since 1994; for Medway the figure is 32%. These compare with England and South East averages of 18% and 17% respectively, and indicate the relatively greater intensification of pressure on the road network in Kent & Medway.
12. Despite the significant investments in transport connectivity in the Thames Gateway Kent area, the lesson from our experience is that the job is not done. Holistic solutions are required both to fulfil the economic potential of the Thames Gateway and to guarantee the performance of the corridors and connections on which the economies of the Midlands and the North heavily depend.

The A2/M2 and A20/M20 Corridors

13. The A2/M2 is already heavily congested with journey time reliability as low as 66% in key sections². The design and capacity issues associated with the Bean and Ebbsfleet junctions on the A2 are acknowledged by Highways England: improvements are programmed for completion by 2023. Improvement of the M2/J5 is a committed future project. The M2 is effectively a bypass for the Medway Towns, Sittingbourne and Faversham as well as a strategic road corridor. Similarly, the M20 is a major distributor road for local journeys, particularly for Ashford and Maidstone, as well as the strategic corridor linking the channel ports to the UK roads network. Consequently these routes and the links between them, such as M20/J6-A229-M2/J3 suffer heavy congestion in peak periods.
14. Across Kent's part of the Strategic Road Network, freight vehicles account for up to 41% of the traffic³. In Kent, freight traffic is concentrated on two strategic routes (M20/A20 and M2/A2) with the principal route to the Channel ports being the M20/A20 as part of the TEN-T Trans-European road network. Over the last 20 years, the number of goods vehicles travelling from Great Britain to mainland Europe has increased by 83%⁴.

¹ DfT Road Traffic Statistics, Table TRA8901

² DfT Statistics, Table CGN0106

³ Highways Agency (2014) Kent Corridors to M25 Route Strategy Evidence Report

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/364209/Kent_Corridors_to_M25_Evidence_Report.pdf

⁴ Department for Transport (2015) Statistical Release: Road goods vehicles travelling to mainland Europe: October to December 2014 (quarter 4)

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/404778/roro-2014-04.pdf

15. The Port of Dover and the Channel Tunnel are nationally important facilities. As the shortest crossing point between the UK and mainland Europe, the Dover Strait ports (Dover, Channel Tunnel and Ramsgate) account for 69% of all goods vehicles or 89% of all powered goods vehicles that travel between the UK and mainland Europe⁵. This generates substantial HGV traffic movements through Kent. Approaches around Dover on the Strategic Road Network suffer from 'moderate' and 'regular' congestion, which by 2040 is forecast to increase to 'regular' or 'severe' congestion in peak periods even with the investment from Highways England's Roads Investment Strategy (RIS)⁶.
16. In 2014, 2.4 million goods vehicles (average 6,600 per day) and 2.5 million cars and coaches passed through the Port of Dover⁷. Movements through Dover are expected to increase with plans for improvements to the Eastern Docks and the Western Docks Revival which will enhance the capacity of the Port. The Port of Dover⁸ has a planning assumption for the freight market (Dover Strait ports) based on a long-run Compound Annual Growth Rate (CAGR) of between 2% and 4% (over the period 2000 – 2014 CAGR was 2.5%), although the market is currently growing much faster and in the short term this trend is expected to continue. Therefore within the next decade there could be between 7,900 and 9,200 HGVs on average per day at the Port of Dover. At peak times there will be a significant number of days when the port handles in excess of 11,000 HGVs per day.
17. Significant growth in freight movements is also expected through the Channel Tunnel. Eurotunnel already handles significant HGV movements as over 1.4 million trucks (average 3,957 per day) used the Channel Tunnel shuttle service in 2014⁹, besides over 2.6 million cars and coaches. Future growth in freight movements of 30% is predicted for Eurotunnel for the next 5 years between 2015 and 2020 and between 20-25% growth between 2020 and 2025, equivalent to 6,400 HGVs per day by 2025.
18. Overall, cross-channel traffic using the A2/M2 and A20/M20 corridors currently amounts to more than 10.4 million vehicles per year. On the basis of the projections above, the freight element alone is forecast to grow up to 50% from around 3.8 million trucks now to perhaps 5.7 million by 2024¹⁰.
19. The Government has acknowledged the importance of keeping the M20 corridor open in the £250m investment announced for a lorry park to replace Operation Stack. This is welcome and essential, but it is still only a partial answer to a core problem of capacity and resilience on the main transport corridor connecting UK regions to Europe.

Existing and future Thames crossings

20. The most vulnerable link in the Thames Gateway roads network is the existing M25/A282 Dartford-Thurrock crossing. With use heavily exceeding capacity, and ongoing northbound congestion at peak periods despite the introduction of free-flow tolling in autumn 2014, this is "one of the least reliable links in national strategic roads network"¹¹. This much is acknowledged in the long-running process of consultation and development of options for a **Lower Thames Crossing**.
21. More resilient connections between the channel ports and the East of England, Midlands and North are vital to the success of the national economy, and particularly for logistics, businesses importing and

⁵ Department for Transport (2015) Statistical Release: Road goods vehicles travelling to mainland Europe: October to December 2014 (quarter 4)

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/404778/roro-2014-04.pdf

⁶ Department for Transport (2015) Road Traffic Forecasts 2015

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/411471/road-traffic-forecasts-2015.pdf

⁷ DfT Statistics, Table PORT0409

⁸ Godden, T. Port of Dover – email correspondence with Kent County Council 12/05/2015

⁹ Eurotunnel website accessed 29/04/2015 <http://www.eurotunnelgroup.com/uk/eurotunnel-group/operations/traffic-figures/>

¹⁰ Further detail is contained in the Report of the European Gateway Strategic Delivery Group, July 2015, Kent CC.

¹¹ Government Response to Consultation Options for a New Lower Thames Crossing, CM 8895, p.10.

exporting, and supply chains. The unreliability of the existing crossing adds cost to businesses and consumers not just in the South East but in all parts of the economy that rely in goods and services traversing routes from the Channel ports to destinations north and east of London.

Issues for the National Infrastructure Commission

22. We await with interest the Department for Transport/Highways England consultation on the preferred route for the proposed Lower Thames Crossing. However, without pre-empting the proposals to be put forward and the Partnership's consultation response, there is clear consensus amongst partners that the entire Channel ports to M25 corridor needs to be considered holistically. A network is only as strong as its weakest link. Whatever the location of the Lower Thames Crossing and its connections north and south of the crossing itself, the A2/M2 and A20/M20 corridors, and the links between them, need to be able to perform to a consistently higher standard than at present.

23. We would therefore urge the Commission to give early priority to:

- a. Examining the resilience of highways networks connecting the preferred route of the Lower Thames Crossing to the Channel Ports and the options for upgrading those connections on a timetable consistent with that proposed for the Lower Thames Crossing;**
- b. Examining the options for accelerating delivery of both the Lower Thames Crossing and associated network improvements.**

London's transport infrastructure

24. In this section we focus on two questions posed by the Commission regarding the future of London's transport infrastructure:

- 1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?**
- 2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?**

25. London aspires to be self-sufficient in meeting the housing needs of its growing population within the GLA boundary. But rising prices are pushing London's workforce ever further outwards in search of housing affordability. Its 'commuter hinterland' is thus progressively being redefined both as London-based workers travel from further away, and as selective infrastructure investments – such as HS1 – 'move' certain destinations closer to central London in terms of journey time.

26. A major emphasis of London Mayoral policy over a number of years has been to focus London's growth eastwards. This overlaps with the vision for the Thames Gateway as offering the greatest potential to support London's growth.

27. That potential brings both threats and opportunities. Delivering the Thames Gateway vision means growing local employment opportunities across the Gateway, as well as responding to the opportunities and demands of London's employment markets. The stretching of London's commuter hinterland puts further pressure on both housing markets and transport and other infrastructure in North Kent. Analysis carried out in June 2011¹² showed that an estimated 55,000 (19.4%) of the nearly 282,000 North Kent workforce were travelling to Greater London for work. For some boroughs bordering the Capital, such as Dartford, the proportion was over 36%. More than half of travel to work in Greater London from Kent and Medway was attributable to the four local authority areas in Thames Gateway Kent. These journeys would predominantly be made via the North Kent Southeastern rail lines, HS1 and along the A2/M2 corridor.

¹² http://www.kent.gov.uk/data/assets/pdf_file/0010/8200/Updating-the-2001-Journey-to-Work-Matrix.pdf

28. Commuter pressure is already evident on these transport networks. The previous section has referenced the highways congestion especially on the A2/M2. Peak rail services including HS1 already run at or exceeding capacity from many North Kent stations; and genuine high speed performance is only delivered on HS1 between Ebbsfleet and London. With projected growth of 58,600 homes, 115,400 people and 59,100 jobs in North Kent from 2011-2031¹³, pressures on capacity and performance will be magnified. Proposals are also emerging for significantly enhanced levels of growth in the adjoining London Borough of Bexley, and at the Isle of Dogs in London's Docklands. The continued commercial expansion at Docklands depends upon access to a wide labour pool, for which enhanced rail and other public transport connectivity, such as eastwards extension of Crossrail 1, will be crucial.
29. Those growth projections do not take account of the possible creation of the London Paramount Entertainment Resort (LPER) at Swanscombe Peninsula. If approved, LPER is expected to create 8,500 jobs on site (6,700 in the resort and 1,800 in hotels) plus at least 15,700 further direct and indirect jobs in the supply chain¹⁴, largely within the same travel-to-work corridor but also extending to other parts of Kent, Essex and south and east London. LPER are also modelling on the basis of an average 40,000 visitors per day from opening in 2021. During consultation on their emerging proposals, London Resort Company Holdings indicated an expected modal split of 58% of visitors arriving by private car and 24% by rail. Putting the highways impacts to one side, on the basis of these forecasts rail passengers (visitors and workforce) would add over 9 million journeys (entries and exits) onto the North Kent rail network per annum.
30. It is with these pressures in mind that TGKP has been urging Government:
- c. To facilitate a strategic and joined-up approach to the related issues affecting future rail capacity in North Kent, including the re-franchising of Southeastern rail services and Network Rail's Kent Route Study; and
 - d. Specifically to consider the the business case for extension of Crossrail from Abbey Wood to Gravesend via Ebbsfleet.
31. TGKP is a partner in a project being led by Transport for London, together with the Greater London Authority, Kent CC, Ebbsfleet Development Corporation and London Borough of Bexley, undertaking a study to understand the economic case for such an extension of Crossrail that takes account of this anticipated growth. TGKP are joint signatories with other project partners of a separate submission to the Commission giving more detail and supporting evidence on this aspect.
32. **We would welcome the opportunity to share the outcomes from this study with the Commission. We also suggest it would be helpful for the Commission to examine over the coming months the interplay between the different work programmes (Crossrail extension, re-franchising, Kent Route Study) in order to help realise optimal outcomes from, and prioritisation of, the investment associated with each.**

Thames Gateway Kent Partnership

8 January 2016

¹³ Kent & Medway Growth and Infrastructure Framework, AECOM, September 2015: Development Suitability Analysis for Dartford, Gravesham, Medway and Swale. http://www.kent.gov.uk/_data/assets/pdf_file/0012/50124/Growth-and-Infrastructure-Framework-GIF.pdf

¹⁴ See <http://www.londonparamount.info/jobs-and-skills/>. The job numbers quoted are full time: it can be expected that with job-sharing and part time working the number of people employed and therefore travelling to and from the Resort could be significantly higher.



To: londonevidence@Infrastructure-Commission.gsi.gov.uk

From: Thames Valley Berkshire LEP

8 January 2016

**National Infrastructure Commission – Call for Evidence
Response from Thames Valley Berkshire LEP**

[contact redacted]

We give consent for this response to be published, and for TVB LEP to be identified as the author.

Question	TVB LEP response
<p>1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?</p>	<p>Thames Valley Berkshire Local Enterprise Partnership published its Strategic Economic Planⁱ in 2014. We are home to a strong, productive and vibrant economy producing over £34bn GVA. We are among the strongest LEP economies in the UK. We do not find the description “commuter hinterland” helpful or useful in planning for our own economic growth. We are in discussion with neighbouring LEPs and we know that this view is shared.</p> <p>Our key locational advantage is proximity to Heathrow Airport and to central London, but our economy has its own dynamism and its own investment needs.</p> <p>Our analysis shows that labour supply issues are the single biggest threat to the continued growth of our economy. This is evidenced by high house costs both for rent and purchase, and by long commuting journeys to work. Our recent SHMAA (Strategic Housing Market Area Assessment) shows an objectively assessed need (OAN) for major housebuilding in our area (20% increase over 20 years) and that calculation does not include accommodating London’s growth needs.</p> <p>The major economic challenges we see are:</p> <ol style="list-style-type: none"> 1) Achieving certainty over expansion plans for Heathrow Airport 2) Being able to deliver a very large expansion in the supply of housing

www.thamesvalleyberkshire.co.uk

Registered address: 100 Longwater Avenue, Green Park, Reading, Berkshire RG2 6GP
A company limited by guarantee and registered at Companies House No. 07885051

	3) Being able to deliver a transport system that promotes orbital journeys around London as well as radial journeys in and out of London.
2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?	We have jointly commissioned an economic impact study that addresses exactly this question for four LEPs to the South and West of London. They are Coast to Capital, Solent, Enterprise M3 and Thames Valley Berkshire. This study is due to report early in 2016.
How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?	The above mentioned study has developed a methodology that attempts to prioritise strategic transport investments by overall economic impact.
What might their potential impact be on employment, productivity and housing supply in London and the southeast?	We will publish our study early in 2016.
3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?	We suggest that consideration be given to extending the south-western route by building new track-miles to serve Heathrow Airport. We are not convinced that a new Southern Rail Access to Heathrow scheme can be devised by utilising the existing congested tracks in South West London without having a detrimental effect on existing rail users.
4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?	-
What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?	-
What innovative funding mechanisms could be considered to support delivery of key schemes?	-
5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?	-

ⁱ http://thamesvalleyberkshire.co.uk/Strategic_Economic_Plan

TransportPlanning*Society*

Submission to the National Infrastructure Commission

Call for Evidence 2: London's Transport Infrastructure

Introduction and Wider Context

TPS supports the principle of greater consistency in the planning and funding of infrastructure at local as well as national level. It also believes that planning for infrastructure needs to have clear and specific quality of life objectives, not just a vague feeling that it must be good for the economy and then, subsequently, for people's lives.

We preface our response by raising three key issues of general application:

- the importance of allowing for the revenue consequences of capital expenditure on infrastructure and the substitution of revenue for capital (for example through demand management)
- the need to integrate transport infrastructure and land-use planning
- the need to ensure that the diverse impacts of new infrastructure for different activities are reflected in the Commission's work

Capital and Revenue

It is important to understand that capital spending in transport in particular produces revenue benefits (much of which is user time savings) rather than direct capital appreciation. This may seem obvious but has important implications for public understanding of the balance between revenue and capital expenditure which is essential if spending is to improve people's lives. Of course there are indirect capital gains from transport, the most obvious being land values.

It is also the case that the distinction between them is not clear cut – for example is the forecasting, planning and policymaking which underpins capital spending counted as revenue? If it is (as is often the case) we are quite likely to build the wrong schemes in the wrong places if the revenue budget is cut. The importance of the skills base in terms of those who commission any transport project should not be underestimated – in local authorities this has been severely weakened and any new governance arrangements must include specific proposals to create the "intelligent clients" that will be needed.

A second complication is the way that revenue schemes can obviate the need for major schemes – those which reduce demand are the obvious example.

For reasons such as these, in the TPS annual survey members place very high priority for transport spending on what are essentially revenue items such as road maintenance and smarter travel choices¹.

Thus it is rare in a developed economy that progress can be made, for example increased connectivity between places, without revenue expenditure relating to:

- The adequate maintenance of existing infrastructure, including its development and improvement
- Expenditure on services to use that infrastructure, particularly important for public transport, walking and cycling
- The provision of programmes such as travel behaviour change or road safety.

¹ The top 5 in order of priority are: Walking and cycling; Non-High Speed Passenger railway capacity improvements; Travel behaviour change (Smarter Choices); Tackling poor air quality; Road maintenance.

Both of the last two items may be supported by new infrastructure but require more direct revenue support, for example travel planning can include paying public transport fares for those returning to work (some local authorities do this but money is now unlikely to be available).

Thus a balance between revenue and capital is needed and this is why we ask the Commission to reflect this throughout its work.

Real impacts of transport spending and the interaction with Land-Use

In reality the benefit from transport investment arises from its interactions with social and economic behaviour, notably locational and modal choices. At a strategic level, these interactions include:

- ‘Compact, liveable cities’ are critical to realising the potential agglomeration benefits of urban concentration, but are undermined by the poor UK record of land-use/transport integration. A focus on large capital schemes, poorly integrated into the urban fabric and not part of an overall transport and spatial plan, has played a major part in this deficiency².
- The balance between public transport, non-motorised modes and road investment is distorted by the disconnected delivery, pricing, appraisal and planning arrangements. Roads that are free at the point of use, together with over-emphasis of road user time-savings in appraisal, rather than changes in behaviour and land values, has led to this strategic imbalance.
- More dispersed locational choices within existing housing and commercial stock are progressively ‘hardened’ by more dispersed patterns of new development. Both factors lead to increased transport demand, particularly for roads, with resultant congestion degrading transport system performance.
- It is our considered view, and has been for some time, that major new road capacity will not solve congestion unless comprehensive demand management (almost certainly by price and including freight) is in place. Indeed it is likely to be counter-productive. Smart motorway programmes, by contrast, can offer a wide range of benefits from better overall management and make better use of existing assets.

Land use and the provision of transport are closely linked and unco-ordinated planning of either, or one seen as subservient to the other, leads not to efficiency, sustainability and economic growth but to unnecessary travel and congestion and equally poor performance in terms of the economy, safety and the environment.

Multi-layered approach to connectivity

The comments above lead to the conclusion that simply connecting places, without defining what those places are and why we want to connect them, will at best lead to inefficient allocation of transport spending and at worst to causing net disbenefits, even though these may fall outside transport, for example personal health and climate change.

In order to identify where connectivity will have a positive impact it is important to understand different spatial geographies – for example journey to work areas need to

² Since the creation of the GLA and TfL this issue is being partly addressed, at least in London, see the London Infrastructure Plan at <https://www.london.gov.uk/file/22098/download?token=XZV8z8Az>

inform commuter travel plans, freight interchanges (sea, air, road and rail) and the consequent demand should help define freight networks. Local businesses need the concentration of urban form referred to earlier, thus walkability is the key. On the other hand, businesses which need bigger catchments (some stretching beyond the boundaries of individual Northern cities) need those cities to be connected with frequent, attractive, fast rail services. One of the key theoretical advantages of linking the Northern cities is that they will provide sufficient catchment for businesses to be able to locate in the North rather than serve Northern businesses from London and the South East or Northern Europe.

The idea of a layered approach with different networks has been explored in several of the TPS sponsored research bursaries, for example in the 2012 “Flexible geographies and what ‘localism’ could mean in the context of transport planning”³ which said it would be possible: *“to move from notions of ‘local communities’, ‘local transport consortia’ and LEPs based on ‘functional economic space’ to a conception of ‘flexible local geographies’ which facilitate public service delivery at the most appropriate level possible and which are responsive to a plurality of requirements.”*

In a developed country such as the UK such a sophisticated approach is essential, and is easily within our current analytical techniques⁴, indeed could be simpler than many existing major scheme road traffic models.

Thus the different networks which would meet the different connectivity requirements (city to city, suburb to city, port to distribution centre, airport to airport, airport to city etc.) should be identified individually first. Scale of use can be assessed – not necessarily a precise forecast. The impact of improved connectivity by definition has no existing pattern of use from which the future can be extrapolated.

The networks can then be aggregated so that multi-use infrastructure can be designed. This more precise targeting would have a major impact on the design of road and rail schemes. Two examples on rail would be the mixing of commuter and city to city services and ensuring the needs of freight could be better accommodated. The creation of freight train paths through a busy passenger network is already a major problem in corridors including the two which are the subject of this consultation (Connecting Northern Cities and London).

Key points for the Commission’s work

We therefore ask that the Commission’s work avoids the traditional “pay and walk away” attitude and always includes:

- consideration of future land use impacts from new infrastructure and patterns of connectivity
- an estimate of the revenue required for the most efficient use of new infrastructure and its maintenance (including smart use and intelligent mobility)
- consideration of revenue based solutions to the identified problems which change the nature or extent of the planned infrastructure projects, and of “big cap versus small cap” – particularly important for smart technologies versus large scale fixed infrastructure

³ Author James Beard, paper based on his bursary presented to the annual Transport Practitioners Meeting in 2012

⁴ For example layered network accessibility mapping

- use of a multi-layered approach to building up connectivity requirements and subsequent initiatives (revenue or capital)

In addition, improving connectivity is very uneven in its impacts, varying by:

- Mode of travel (including walking and cycling)
- Purpose of travel (not just for personal travel but including freight)
- Different physical geographies
- Different patterns and types of land use (including availability of land for housing, employment, education, culture and leisure)
- Distribution of human capital in the areas which are being connected – most obviously skills and how they match demand, but also culture, leisure and social capital
- Nature of businesses in the area affected – for example different types of businesses may need access to only one or several of the following and a single piece of infrastructure is unlikely to achieve them all:
 - wider labour markets
 - higher quality travel (especially locally)
 - more international connections
 - large scale multi-modal freight services
 - collaborative research bodies (for example universities)
 - proximity benefits through dense development and social walkability (for example London’s “Silicon Roundabout”).

Impacts of any single piece of infrastructure can be positive for some of these requirements and neutral or negative for others. Again this is not a situation where there is a blank canvas and there are high risks of unintended consequences – the M25 is a famous example. While a new piece of infrastructure may be intended to produce a primary benefit, its other impacts should not be ignored.

This argues for clarity of purpose, respect for what is already available and a deeper understanding of the way in which transport creates or facilitates change.

The TPS Response to the NIC’s questions

We welcome the opportunity to respond to the National Infrastructure Commission on the pressing issue of London’s transport requirements over the next 20 to 30 years. We have kept our response brief and focused on the key points referred to in the NIC’s call. Our members have much to offer in terms of expertise and would welcome the opportunity to further assist the Commission in its work.

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

The major challenges facing London and wider South East are undoubtedly the anticipated population growth and related job creation, the related problems of capacity constraints across infrastructure types and a long term problem of building too few homes to accommodate the growth in households.

The London Infrastructure Plan 2050 (LIP 2050) sets out a projected population growth of over 40% by 2050, bringing London’s population to over 11 million.

Much of London's infrastructure is already at or close to capacity, with London and surrounding areas facing real possibilities of experiencing water shortages and power blackouts. Commuter lines into London and the tube network frequently experience potentially dangerous levels of overcrowding. Significant parts of the Capital's main highway network are already stretched to and beyond their practical capacity with the result that whole areas can become gridlocked with the slightest of incidents.

Housing regularly tops Londoners lists of concerns, based on exceptionally high selling and rental prices, as well as over-occupation. An estimated 50,000 homes are required per year to 2050, significantly more than has been built in London in previous years.

A lack of affordable housing and the potential for infrastructure failures have obvious impacts on Londoner's quality of life. Whilst London still remains an attractive place for young professionals, high house prices could soon see young skilled and essential but still lower paid workers moving out of the city to areas where they can buy or afford to rent a property. When this happens on a large scale as is now most likely, London could experience a skills and worker shortage that would significantly effect London's economy. This would also apply further pressure on radial transport links (both road based and rail). **Transport operational staff in particular need to live close to their workplaces.**

Businesses are unlikely to choose to locate in a city that experiences power outages or one where their workforce cannot afford to live.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

There are parts of London with significant space for house building that are currently not being built on. In many cases the reason is simple; these areas do not have effective transport connections. Barking Riverside is a prime example, where brownfield land has the potential for over 10,000 new homes to be built. In the absence of the proposed extension of the London Overground to Barking Riverside, no more than 1,500 new homes are permitted. Such development will bring jobs and economic growth to the area. ***The provision of additional housing and related employment should be planned in tandem with upgraded and new transport provision and this must be placed at the top of any prioritisation assessment.***

A strategic long term approach is required that maps out London's key transport requirements. A project by project approach will not provide London with the best outcome; it is the combined impact of transport, housing and infrastructure investments that will realise the highest benefits for London.

The LIP 2050 sets out a strong plan for London's transport investment to 2050, albeit with the need for further prioritisation and an update when the Government makes its decision on airport capacity. The need for future reviews and updates, should not delay implementation of the projects identified as necessary in the nearer term. **With regard to additional airport capacity, we believe that it is essential that this review of London's infrastructure needs actually addresses the important strategic connections between the location of this additional capacity and other planned and putative rail and road schemes. The exclusion of this most important aspect from the NIC's current remit leaves a major gap in the exercise.**

Better transport links to the wider South East must also be a high priority. The proposed Crossrail 1 extension to Ebbsfleet and giving Transport for London control of more South East rail routes are crucial in ensuring the wider region is also able to unlock housing. Equally, Crossrail 2 could include a new link to Gatwick airport via Clapham Junction, Wimbledon, Epsom and possibly Dorking providing greater overall resilience to the strategic links serving this growing traffic generator. Through North London, Crossrail 2 could provide an additional link to Stansted and TfL should consider how this project can help strengthen access to the airport and how it impacts on airport capacity needs. The 4-tracking in the Lee Valley needed for Crossrail 2 would enable improved and more resilient access.

Transport for London has identified a wide range of interventions which have strongly positive business cases. We do not propose here to rank individual projects but see a pressing need for two projects in particular, namely Crossrail 2 and the Silvertown Tunnel.

Given its forecast beneficial impacts on transport relief and economic development, Crossrail 2 must be a priority and TPS is pleased to see a growing consensus from local, regional and national government on the need for the scheme. Many of the benefits of Crossrail 1 have already been seen in terms of unlocking housing growth and the TPS believes that similar gains will be accrued from Crossrail 2. Crossrail 2 should be a catalyst for directing and intensifying housing and employment along its route. It has the potential to distribute new employment growth outside the congested central London area.

Similarly, the Silvertown Tunnel is a major scheme to alleviate congestion on the Blackwall Tunnel. The overall crossing requirements of East London urgently needs to be considered in the manner set out in the introduction, bearing in mind the differences between West London and the Thames Estuary, where there will be fewer opportunities for walking and cycling to create genuine cross river communities. Silvertown Tunnel should be considered in the context of new river crossings, road, bus, tram or rail to the east of Tower Bridge. We also think there are opportunities for new technologies to be explored in the spectrum between bus and traditional heavyweight trams. Such infrastructure would open up opportunities for housing and employment growth at London Riverside and Royal Docks Opportunity Areas. Such schemes have long been regarded by existing employers and potential inward investors as being absolutely top priority.

The road component of any infrastructure plan should be accompanied by user charging, in this case tolls are already part of TfL's plans but these must be set sufficiently high to control traffic, including that diverting from Dartford.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

The Government has the ability to significantly reduce the costs of infrastructure build in London by clearly committing to a long term programme of work. This program should not be changed at political whim, but revisited periodically and adjusted to reflect changes in the way the city functions or technological advances.

A clearly set out programme of work, that sets out the timeline for major project delivery and commits to funding, will allow the construction industry to reduce costs:

- Planning for their workforce now – this will ensure there are adequate numbers of skilled workers, and avoid the need to pay excessive wages to those with skills in short supply. It will also reduce delays.
- Planning their supply chain now – this will reduce delays and the cost of sourcing materials and component parts. This will have the added benefit of allowing firms around the UK to gear up to supplying projects such as Crossrail 2, avoiding the need to source materials from abroad.
- Certainty will enable greater investment, which will require a lower rate of return due to the lower risks of the project being stalled or abandoned.
- A long term plan will enable effective sequencing of projects, to either remove clashes for particular skilled workers or allow synergies to evolve e.g. where joint training academies are established. Maybe this should be first?

The London Infrastructure Plan 2050 and the Mayor’s Transport Strategy need to be articulated into a programme of work that sets out and sequences the key infrastructure projects and development sites over the next 20 years.

The TPS believes this is the single most effective way to reduce costs. On Crossrail 2, there are likely to further efficiency savings that are possible for use of different building materials and/or custom building of stations. Further innovations may come forward that reduce costs. This is tax payers and London fare payers’ money being spent, so every effort needs to be made resources available to make sure it is being spent wisely.

The TPS recommends that infrastructure providers, innovators and academics are brought together and set the challenge to reduce the build cost of Crossrail 2. Many of the innovations that come forward would likely be applicable to wider infrastructure build.

The benefits of Crossrail 2 will be maximised when it is planned alongside London’s wider infrastructure needs. This will ensure the possibilities for integration are taken full advantage of.

For example, green infrastructure should form a central part of station build, with green roofs and sustainable urban drainage around stations. This will reduce the need for traditional ‘grey’ drainage solution that are typically much more costly, as well as contributing to overall place making around stations. Including green infrastructure in the construction brief is far more cost effective than retro fitting later and will be particularly important in areas like the Upper Lee Valley where the growth areas are located in [flood risk zone 3a](#) and have a high probability of flooding

Providing green infrastructure has clear social and economic benefits. Examples are improving public health through cleaner air quality and reducing risks to lives from flooding and heat waves.

With coordinated planning Crossrail 2 tunnels can carry fibre optics for digital connectivity, an opportunity that was missed with Crossrail 1.

One of the main benefits of Crossrail 2 is the potential to unlock significant housing growth along its route. ***The potential for the creation of new vibrant communities will be maximised if there is a clear and early commitment to fund and deliver Crossrail 2 to stated timescales.*** Experience from London’s Docklands demonstrated that an early physical and hence visible start at least to preparatory works generates early simultaneous inward investment. This will give developers the confidence to start building homes and

invest in the public realm aspects of the development that will ensure high quality places to live are created.

Jobs are the other main benefit for London overall and areas along the route, again a clear commitment to Crossrail 2, will allow training programmes to be put in place to ensure local people benefit from the job opportunities created.

The benefits of Crossrail 2 will spread far wider than London, and this must be factored into any consideration of the benefits.

The rail line will serve the wider South East and will connect to National Rail networks in Hertfordshire and Surrey, better linking those to the London Underground and national and international services. Crossrail 2, like Crossrail 1, is forecast to generate jobs around the UK – 60,000 while it is being built and 200,000 once the project is operational.

Crossrail 2 will maximise the effect of other transport investments, particularly those such as High Speed 2, that better connect other parts of the country to the capital; by relieving congestion at key points where National Rail lines meet the London Underground. It would be less than optimal to improve journey times into London, only for passengers to be held up accessing an overcrowded tube network. HS2 arriving into Euston station is the obvious example.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

Crossrail 2, along with many of London's other transport requirements have a positive business case and will generate significant additional value for London and the UK as a whole. In the long run, investment will pay for itself through higher productivity, greater revenues to business, increased land and property values, and increased tax receipts for government. ***The issue is how these gains are captured and used to fund infrastructure investment.***

The TPS support's the GLA's pursuit of additional fiscal devolution. Devolution of the form set out by the [London Finance Commission](#), whereby London retains income from property tax to make self-determined investments in its infrastructure, would provide a source of revenue in itself and provide greater scope to borrow to fund infrastructure. A funding gap will still remain, and alternative funding mechanisms will be required.

Transport investment in particular can have a significant impact on property prices. Crossrail is demonstrating this well, even before it has opened – Whitechapel residents are expected to see a 54% increase in property values, with the average increase along the line expected to be 9%. As a minimum, the increase this brings in stamp duty and business rates revenue should be available to London, which the city can then borrow against to fund transport projects.

Learning from the Northern Line Extension and similar schemes, there are opportunities to take advantage of local uplifts in land values. ***The TPS would like to see mechanisms put in place to allow the capture of increased property and land values for example through the opportunity and compulsory purchase of land parcels along key new transport routes and through additional property taxes in areas that have seen significant increases in property values due to transport investment.***

Crossrail was funded by equal contributions from Central Government, London Government and London business. London businesses were in support of this arrangement and are signalling similar levels of support for a comparable arrangement for Crossrail 2.

It is reasonable to argue that those who benefit should pay, its seem logical that the cost should be shared between National Government (who will gain from increased tax revenues), property developers (who will gain from higher returns), residents (who will see a rise in the value of their property), passengers (who will gain from improved connectivity, reduced journey times and so greater access to jobs and leisure opportunities) and London businesses (who will gain from improved connectivity for customers and employees).

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

On financing, the Mayor of Chicago Rahm Emmanuel set up a Chicago Infrastructure Trust as a new method of generating private investment for infrastructure projects.

The Trust has funded an energy retrofit programme for 60 public buildings, costing \$12.234million and recently negotiated a \$32million 4G upgrade of the Chicago transit system. It has also been suggested that the Trust could fund a high speed rail link to O'Hare Airport.

The Trust does not work as a Private Finance Initiative (PFI). Instead, the Mayor would release bonds for the private sector to invest in, whilst ownership and management of the infrastructure would remain with the public sector.

In London, an Infrastructure Trust could be set up in the same way as the London Enterprise Panel, under sections 30 and 34 of the Greater London Authority Act 1999. Should a Trust be set up, it could provide a significant level of funding for projects like Crossrail 2.

The TPS would support further applications of the Mayoral Development Corporation model but with the ability to link groups of development/regeneration sites along the "string of pearls" routes defined by the new rail links and extending beyond the GLA boundary.



RESPONSE TO THE NATIONAL INFRASTRUCTURE CALL FOR EVIDENCE

RESPONSE TO THE NATIONAL INFRASTRUCTURE CALL FOR EVIDENCE

Paragraph 3. London's Infrastructure

RESPONSE. 3.1.2

THE ECONOMY

The effect of the development of our rail and road network in the UK was to bring economic development to areas which would have otherwise remained in a backwater.

Goods could flow freely between centres of manufacturing and businesses could interact with their counterparts in centres across the UK.

The government Command Paper, **Action for Roads A network for the 21st century**, sets out the government's vision for our roads:

Our road network is also the life-blood of the economy, performing a crucial function in supporting jobs and growth.

Roads provide critical connections. They link major economic centres, and connect our major ports and airports. Many people use them to get to railway stations and to connect to other modes of transport. Four of the new stations planned under High Speed 2 will link to the motorway network.

Roads support job creation and unlock new development. They provide access to labour markets and unlock new opportunities for factories and businesses. More than 1 million jobs are associated with road transport. Factories and other businesses regularly consider access to good roads and other transport connections in making decisions about where to locate

INFRASTRUCTURE AND THE ECONOMY

It has become increasingly evident that new infrastructure brings in its wake new development. This illustrated in the requirement for every local authority to develop planning documents which must include how the local infrastructure of the area will be developed in order to promote growth and prosperity within the area. Wherever one goes, isolated land suddenly becomes desirable to developers as soon as a new road makes development economically feasible – housing, employment and community use. It is happening all the time.

However, the amount of traffic congestion has become unacceptable within the London conurbation. Do we build more roads, provide more buses? What can we do? Land is scarce and valuable and not an infinite commodity; there comes a time, that even with the best of intentions, it becomes impossible to plan ourselves out of the congestion dilemma facing the London conurbation.

How can we provide more capacity given the scarcity of land? We need to look outside the box. How can we provide more capacity without compromising vital resources?

Double-Decking - Road over Rail

ECONOMIC GROWTH FOLLOWS INFRASTRUCTURE DEVELOPMENT

HOW CAN WE INCREASE ROAD CAPACITY?

Our suggestion is to build elevated roads above the existing railway tracks as they approach London.

Typically, these elevated roads would be:

- dual purpose roads carrying all traffic or,
- limited to vehicles up to 3.5 tonne GVW which would only need short, sharp interchange ramps and narrow lanes, limited access and exit at appropriate locations

Their use could be for:

- express traffic.
- service and delivery vehicles

They would have a futuristic road design which would maintain and increase the global perception of London as a centre of excellence.

The infrastructure building would create jobs and would enhance the desirability of the city of London for inward investment and would contribute to the international status of the city.

Across the world there are many examples of double-decking, but mainly in the use of roads. However, there are many examples of dual purposes bridges carry both road and rail.

LONDON RAILWAY CORRIDORS

We consider that there is potential in studying the routes set out below, to determine the feasibility of building roads on top of the railway infrastructure.

- Charing Cross to Sevenoaks
- Euston West Coast Line to Watford
- Fenchurch Street to Barking
- King's Cross - East Coast Line to Hatfield
- Liverpool Street to Romford
- Marylebone to Amersham
- Paddington to Slough
- St. Pancras to Luton airport
- Victoria to Gatwick Airport
- Waterloo to Guildford

All of these lines approach London from many different directions. Many of these lines have adequate land at the track side which would facilitate the building of elevated roads. We recognise some lines would have greater potential than others and the method of construction may need to vary between different routes.

Construction activity would not impact on other road users as it would if major roadworks were introduced on the road network

Time has not permitted us to make an in depth study of these corridors but we submit this concept for serious consideration.

STUDIES

HOW TO “BUILD OUR WAY OUT OF CONGESTION” INNOVATIVE APPROACHES TO EXPANDING URBAN HIGHWAY CAPACITY (USA)

Study on double decking

“Alstot, in a paper for the American Society of Civil Engineers, argued that on wide west coast urban expressways, with over 80 percent of the traffic in light vehicles, it is wasteful to build the whole cross-section to heavy truck standards”

Advantages

- Minimal extra land space required.
- Very little need for compulsory land purchase or re-development.
- Construction of infrastructure will boost economy & create jobs.
- Reduction in CO2 emissions from queuing traffic.
- Improves direct access into the centre of city.
- Reduction in traffic on over-populated routes & resulting increase in pedestrian safety.
- Lanes could have short, sharp interchange ramps and narrower lanes
- Continuity of service on the railways due to protection from inclement weather.
- No further demand on green space – minimal impact on the environment
- More opportunity for business expansion (attraction to investors)

CURRENT OPTIONS TO SOLVE LONDONS CONGESTION

“The Mayor of London wants economic output to grow at the same rate as New-York between now and 2030”

His Roads Task Force - Transforming key corridors - Report

The Report includes “TfL is working to investigate opportunities to transform key corridors outside central London, including the North and South Circulars.

The study is looking at options for major schemes on radial and orbital corridors across London, including the feasibility of fly-under, new tunnels and ‘decking-over’ sections of road.

We salute the Mayor for the work he has done and the London Road Modernisation Plan.

This submission is intended to build on the objectives of the Plan.

ROAD OVER RAIL Examples

Bangladesh

Bangabandhu Bridge

The bridge established a strategic link between the eastern and western parts of Bangladesh. It generates multifarious benefits for the people and, especially, promotes inter-regional trade in the country. Apart from quick movement of goods and passenger traffic by road and rail, it facilitated transmission of electricity and natural gas, and integration of telecommunication links. The bridge is on the Asian Highway and the Trans-Asian Railway which, when fully developed, will provide uninterrupted international road and railway links from southeast Asia through Central Asia to northwest Europe.

Basic features of the bridge are length (main part) 5.63 km; width 18.5 metre; spans 49; deck segments 1263; piles 121; piers 50; road lanes 4; dual-gauge railway (broad gauge and metre gauge). Cost - 2.97 billion USA dollars

<https://www.youtube.com/watch?v=S6pXWw6fHk0>

Denmark-Sweden

The Öresund Bridge runs between Denmark and Sweden as a double decker, double-track railway running underneath a motorway bridge. The bridge runs nearly 8 kilometres (5 miles) from the Swedish coast to the artificial island of Peberholm which lies in the middle of the strait. The crossing is completed by a 4 km (2.5-mile) a tunnel, from Peberholm to the Danish island of Amager.

The cost for the Öresund Connection, including motorway and railway connections on land, was €4.0 billion

JRA 5th January 2016



8th January 2016

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Unite note to National Infrastructure Commission Calls for Evidence

This note is submitted by Unite the Union. Unite is the UK's largest trade union with over 1.4 million members across all sectors of the economy including manufacturing, transport, energy and utilities, construction, metals and foundries, information technology, food and agriculture, financial services, health, local government and the not for profit sectors.

Unite is unable to respond to the three separate calls for evidence, not least on account of the tight timescale given - effectively eight weeks including the Christmas period. This is not a suitable consultation period.

However, we do want to make an important general point to the Commission.

The current crisis in the steel industry has highlighted the need for British steel to be at the heart of major infrastructure projects.

European rules give EU governments the capacity to award procurement contracts based on 'buying social', a principle which Unite supports. This allows governments to consider the social impact of contracts through the 'most advantageous economic tenure' in the award procedure which will enable governments to put more emphasis on quality, environmental considerations, social aspects and innovation, whilst taking into account the price and life cycle costs of goods being procured.

Government has amended procure guidelines, but the impact of these changes will not be apparent for a considerable time.

We note that this is a point picked up by the House of Commons Business, Innovation and Skills Committee in its report into the UK steel industry published just before Christmas 2015.¹ The Committee calls on the Government to “actively champion the use of domestic steel in large public infrastructure projects.” More specifically, it recommends that:

“the National Infrastructure Commission looks closely at how the interests of UK steel industry and its supply chain can be considered in relation to large scale procurement decisions.”

We believe that major infrastructure projects should use British steel to support steelmaking and manufacturing in the UK, a key component of the UK economy.

[contact redacted]

8th January 2016

¹ <http://www.publications.parliament.uk/pa/cm201516/cmselect/cmbis/546/546.pdf> (page 16, paragraph 20)



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¹ <http://www.publications.parliament.uk/pa/cm201516/cmselect/cmbis/546/546.pdf> (page 16, paragraph 20)



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Unite note to National Infrastructure Commission Calls for Evidence: transport

This note is submitted by Unite the Union. Unite is the UK's largest trade union with over 1.4 million members across all sectors of the economy including transport, manufacturing, energy and utilities, construction, metals and foundries, information technology, food and agriculture, financial services, health, local government and the not for profit sectors.

Unite is unable to respond to the three separate calls for evidence, not least on account of the tight timescale given - effectively eight weeks including the Christmas period. This is not a suitable consultation period.

We are happy to engage further with the Commission on further points of detail in future. But we would like to draw the Commission's attention to the following:

- In our submission to the Department for Transport's Maritime Growth Study we argued that in the short term, the west coast of the UK will have a greater growth potential than the east coast and that the opening of Port Salford and Liverpool 2 will provide Manchester and its surrounding area with the manufacturing opportunities.¹
- In our submission to the Airports Commission discussion paper on utilisation of the UK's existing airport capacity we pointed out that since Manchester has opened its second runway, it has obtained more interest from airlines in developing routes. As a result a greater number of passengers are flying into Manchester as opposed to London, in

¹<https://api.groupdocs.com/v2.0/shared/files/fe52acd00773ad9a77b0204d364315c77bdeb8c7678e13a07825a5924bf65a91?render=true>

order to connect to longer haul routes. This shows that the airport has the potential to become a regional hub.²

- Bus lanes are a vital part of public transport in London. They allow for the travelling public to choose a speedy and reliable form of surface transport that helps the environment supports business and encourages tourists to use a convenient and popular alternative to the private car. Without bus lanes congestion and pollution would increase. TfL & local councils should continue to expand bus lane availability where appropriate between 7am to 7pm. Access should be available to buses, taxis and coaches on all existing and new bus lanes. New road schemes should allow for access for all three transport modes mentioned above.

As the UK's largest transport union we want to draw the Commission's attention to the importance of investment in transport infrastructure.

We have recently published an updated version of Unite's 'Strategy for Transport'³ which goes into more detail, but key points include the importance of the Government:

- investing immediately in modernising our transport infrastructure system to boost productivity and build a sustainable economy;
- delivering in a sustainable and accessible way on commitments made for the high speed rail network;
- delivering on the Crossrail project, which will be essential to the development of London's prosperity and competitiveness;
- ensuring an effective hub airport in an environmentally sustainable manner and addressing the lack of airport capacity in London and the South East by acting swiftly on the Airports Commission recommendation for a new runway at Heathrow.

The Prime Minister has acknowledged the importance of transport infrastructure for growth saying: "without world-class transport we will not get growth; people won't invest in here; and regions in decline will be left further behind."⁴

We believe that investing in infrastructure projects now, such as modernising the UK's transport system, would boost growth in the short term and increase potential economic output over the longer term. Research shows that this would have a small impact on long-term debt and with even a modest impact on productivity, would effectively pay for itself.⁵

²<https://api.groupdocs.com/v2.0/shared/files/f5c930bb69c2f8d2ed6d1f905e4f7a1df4505bd141d83baf79a20809cab2b5?render=true>

³ Available at [http://www.unitetheunion.org/uploaded/documents/Transport%20Matters%20-%20a%20Unite%20strategy%20for%20transport%20\(updated%20December%202015\)11-24947.pdf](http://www.unitetheunion.org/uploaded/documents/Transport%20Matters%20-%20a%20Unite%20strategy%20for%20transport%20(updated%20December%202015)11-24947.pdf) and pdf copy e-mailed to Commission with this note.

⁴ <https://www.gov.uk/government/speeches/pm-speech-on-infrastructure>

⁵ https://www.tuc.org.uk/sites/default/files/tucfiles/infrastructure_spending.pdf

[contact redacted]

8th January 2016

UPDATED

Unite represents more than a quarter of a million men and women transport workers

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Transport Matters



A Unite Strategy for Transport



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Updated November 2015



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UPDATED
NOVEMBER
2015

Foreword:



Len McCluskey

By Unite General Secretary, Len McCluskey

Unite is the UK's largest transport union. We represent workers in all areas of transport including buses, road haulage, logistics, civil aviation, coach, taxi, tram, rail, docks, ferries and waterways. We also represent the majority of union members in the vehicle building and automotive sectors and the aerospace sector.

Unite, and its predecessor unions, has a long and proud record of campaigning for a strong and sustainable transport strategy, and for transport workers. A central part of our economy and every community, transport and transport workers play a critical role - for people, for businesses, for services and for society as a whole.

This Transport Strategy makes the case for a clear and bold strategic role for transport to drive economic recovery, deliver a sustainable future and make for a better and fairer society.

Len McCluskey
General Secretary

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This updated Unite Strategy for Transport was launched at Unite's National Transport Sector Conferences in November 2015.

Transport and devolution

The principles of this Transport Strategy underpin Unite's commitment to transport at all levels across England, Scotland, Wales, Northern Ireland and the Irish Republic. Please see contact page at the end of this publication for further information on Unite's strategy in the respective nations.

International and European transport priorities

There is a clear international dimension to transport and Unite is working with the International and European Transport Workers' Trade Union Federations (ITF and ETF) in addressing many of the challenges faced by the sector as a whole. This includes contributing to the ITF Global Strategy 2014-2018 and the ETF's work programme for 2013-17 which feature activities relevant across transport modes, such as sustainable transport, labour and trade union rights, and cross-border representation, as well as activities that are related to specific sectors (including urban public transport, road, docks, maritime, waterways, civil aviation and railways).¹



¹ <http://www.itfcongress2014.org/>



INTRODUCTION:

TRANSPORT NEEDS A CLEAR STRATEGY

Transport is vital to our lives. It is a public service and an economic driver. It is essential to work, family life, personal independence and opportunity. It helps communities to thrive - locally, regionally, nationally and internationally. Transport also has a critical role to play in meeting the challenges of climate change and reducing pollution.

Transport policy is currently dominated by the impact of global economic pressure and public sector cuts. It is also subject to the legacy of privatisation and deregulation, and by a 'race to the bottom' in the use of contracting, sub-contracting and outsourcing, as well as agency working, zero hours contracts and bogus self-employment.

Transport workers are subject to profit-led cost cutting, undercutting and insecurity which are eroding safety, training and standards, and putting downward pressure on pay, pensions and decent working practices.

Transport users are experiencing overcrowding² and reporting poor satisfaction levels³. Traffic congestion has direct and indirect costs to the economy with one study finding that between 2013 and 2030, the total cumulative cost of congestion to the UK economy is estimated to be over £300 billion, with the annual cost of congestion set to rise by 63 percent to £21.4 billion over the same period.⁴

UK transport needs government to have a clear long-term strategy. This was recognised in separate reports by parliamentary select committees in early 2015. The House of Commons Transport Committee called for an "integrated transport strategy, which takes a route-based approach to road and rail investment, and prioritises connectivity to ports and airports."⁵ The Public Accounts Committee called for Department for Transport to "set out a long term strategy covering the next 30 years for transport infrastructure in the UK, and use this strategy to inform decisions about investment priorities".⁶

A transport policy based on market forces cannot meet the national interest.

What is needed is a clear, integrated and sustainable transport strategy that recognises the importance of transport to society, the economy and the environment, as well as the key role played by transport workers.

Unite is calling for a transport strategy that includes:

- a commitment to investment;
- accessible, affordable, integrated and accountable public transport;
- a fundamental shift away from further privatisation and deregulation;
- safe transport with decent employment standards, equality and protection for transport workers;
- a sustainable transport system that is better for the environment.

² <http://www.theguardian.com/uk-news/2014/sep/21/tube-overcrowding-london-train-lines> and <http://www.bettertransport.org.uk/campaigners-respond-government-figures-rail-overcrowding>

³ <http://www.bbc.co.uk/news/uk-33273393>

⁴ <http://inrix.com/press/traffic-congestion-to-cost-the-uk-economy-more-than-300-billion-over-the-next-16-years/>

⁵ *Investing in the Railway* (2015): <http://www.publications.parliament.uk/pa/cm201415/cmselect/cmtran/257/257.pdf>

⁶ *Lessons from Major Rail Infrastructure programmes* (2015): <http://www.publications.parliament.uk/pa/cm201415/cmselect/cmpublic/709/709.pdf>

TRANSPORT NEEDS INVESTMENT

Transport is critical to the economy. The transportation and storage sector contributes £134bn towards the UK's turnover (4% of the UK total). Gross value added (GVA) for the sector is £91bn (7% of the UK total) and the sector employs 1.45 million people, accounting for 5% of total UK employment.⁷

However, the transport sector should not just be valued on its considerable direct contribution to output and employment. It supports national and local economies in many other ways. Effective transport systems provide access to goods, services and jobs.

Transport is essential to helping city regions to thrive, securing private sector growth across the country and improving exports to international markets.⁸ Transport is also essential to the development of rural economies.

The influential Eddington Transport Study was clear about the long-term links between transport and the UK's economic productivity, growth and stability.⁹ It found that transport schemes can deliver overall benefits averaging £4 per £1 of government expenditure and cited a potential cost of £22 billion a year in increased congestion by 2025 if the transport network does not keep up with demand.

Transport is in desperate need of investment. UK public spending on transport as a percentage of GDP was 1.1% in 2014-15, down from 1.5% in 2009-10¹⁰, and is low by historic and international standards.

Figures from the OECD's International Transport Forum find that UK investment in inland transport infrastructure as a percentage of GDP was 0.6% in 2013. This compares to 1.1% in France and Japan, 0.9% in Denmark, 0.7% in Spain and 1.6% and 1.6% in Australia.¹¹

There is a lack of investment in the UK's infrastructure, including transport, and government has a key role to play. Some have argued that government should set a higher minimum ratio - perhaps 2 per cent of GDP by 2020/21 - for infrastructure investment in key areas like transport and energy.¹²

Public investment in transport must at least match the best international levels.

Investment in infrastructure

The LSE Growth Commission found that the provision of roads, railways and airports in the UK is characterised by underinvestment and inadequate maintenance.¹³ The Commission highlighted that UK road congestion is amongst the worst in Europe, the aviation sector suffers from constrained airport capacity, particularly in the South East, and our railways have a poor reliability record by international standards.

The Prime Minister has acknowledged the importance of transport infrastructure for growth saying: *"without world-class transport we will not get growth; people won't invest in here; and regions in decline will be left further behind."*¹⁴

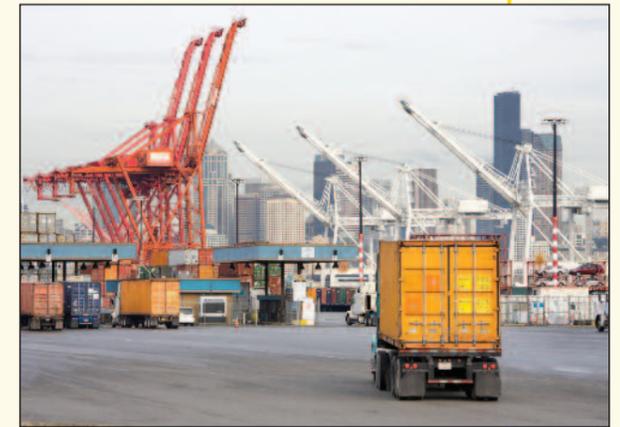
The Government's 'productivity plan' published in July 2015 acknowledges that *"the UK has not invested well enough in the transport infrastructure"* and states that the Government is set to publish a new long-term National Infrastructure Plan for the key economic infrastructure sectors including transport.¹⁵ However, this is hard to square with the Government's freezing of rail upgrades¹⁶ and stalling a decision on a third runway at Heathrow despite the Airports Commission recommending this option.¹⁷

Transport provides a 'multiplier-effect' to other sectors of the UK economy. The British Chambers of Commerce (BCC) has estimated a transport infrastructure 'multiplier-effect' worth around three times the cost of a powerful package of road, rail and airport improvements, which will deliver economic benefits worth a projected £86.3bn for an outlay of £30.1bn.¹⁸

Unite is also concerned about further cuts to departmental spending. In advance of the 2015 Spending Review the Department for Transport, along with other non-protected departments, is facing cuts of 25%-40%. Notwithstanding infrastructure investment, there are real concerns that "everyday transport" - such as local roads, bus services, cycling and walking - will be particularly at risk.¹⁹

Investing in infrastructure projects now, such as modernising the UK's transport system, would boost growth in the short term and increase potential economic output over the longer term. Research shows that this would have a small impact on long-term debt and with even a modest impact on productivity, would effectively pay for itself.²⁰

The Government should invest immediately in modernising our transport infrastructure system to boost productivity and build a sustainable economy.



⁷ *Transportation and Storage: Sector Skills Assessment 2012 Briefing Paper*, UKCES (2012): www.ukces.org.uk/assets/ukces/docs/publications/briefing-paper-ssa12-transportation-storage.pdf
⁸ See *The UK's Growth Landscape*, CBI (2012) http://www.cbi.org.uk/media/1805639/cbi_the_uk_s_growth_landscape_oct_2012.pdf and *Poor transport connections hold exporters back, says BCC* <http://www.britishchambers.org.uk/press-office/press-releases/poor-transport-connections-hold-exporters-back,-says-bcc.html>
⁹ *The Eddington Transport Study* (2006)
¹⁰ Table 4.4, *Public Expenditure Statistical Analysis 2015* (HMT 2015) - https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/446716/50600_PESA_2015_PRINT.pdf
¹¹ http://stats.oecd.org/Index.aspx?themetreeid=24&datasetcode=ITF_INV-MTN_DATA#
¹² *Setting the Fiscal Rules*, IPPR (IPPR, 2015): http://www.ippr.org/files/publications/pdf/setting-fiscal-rules_Dec2014.pdf?noredirect=1

¹³ *Investing for Prosperity*, LSE Growth Commission (2013) <http://www2.lse.ac.uk/researchAndExpertise/units/growthCommission/documents/pdf/LSEGC-Report.pdf>
¹⁴ Prime Minister's speech on national infrastructure, Institute of Civil Engineering, 19th March 2012 - <http://www.number10.gov.uk/news/pm-speech-on-infrastructure/>
¹⁵ *Fixing the Foundations: creating a more prosperous nation* (HM Treasury, 2015): https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/443898/Productivity_Plan_web.pdf
¹⁶ <http://www.theguardian.com/uk-news/2015/jun/25/network-rail-chief-to-step-down-as-385bn-upgrades-are-delayed>
¹⁷ <http://www.bbc.co.uk/news/uk-politics-33341548>
¹⁸ http://www.britishchambers.org.uk/assets/downloads/policy_reports_2010/business_transport_priorities.pdf
¹⁹ <http://www.bettertransport.org.uk/everyday-transport-risk-government-spending-review-say-transport-groups>
²⁰ *Macroeconomic impacts of infrastructure spending*, National Institute of Economic and Social Research (2013) - http://www.tuc.org.uk/tucfiles/592/Infrastructure_spending.pdf

The Government must deliver in a sustainable and accessible way on commitments made for the high speed rail network. Despite concerns about some of the detail of the proposals, Unite supports the principle of HS2 and its extension which should be used to boost jobs and skills. **The Government must also deliver on the Crossrail project, which will be essential to the development of London's prosperity and competitiveness.**

Government must also ensure an effective hub airport in an environmentally sustainable manner and address the lack of airport capacity in London and the South East by acting swiftly on the Airports Commission recommendation for a new runway at Heathrow. This is not just an issue for London and the South East but for the whole UK economy. There is also a need to improve connectivity and regional airport capacity to meet projected passenger growth.



Roy Peters, Roy Peters Photography

Fair and effective procurement

Proper investment in transport must also include fair and effective procurement. Scandals such as that which saw job losses at train manufacturer Bombardier resulting from the Government's decision to award the £3bn Thameslink carriages contract to Siemens must never happen again.

The handling of the Thameslink contract including the calculations of costs and benefits and bundling of train leasing with building and maintenance effectively put Bombardier at an unfair and unjustifiable disadvantage.²¹

Government procurement strategy must be transparent and supportive of UK industry. Contracts, such as that for Crossrail, must include social impact clauses and ensure fairness for British based manufacturing and the supply chain.



²¹ *Knowing What to Do? How not to build trains*, CRESC Research Report (2011) <http://www.cresc.ac.uk/news/news-from-cresc/how-not-to-build-trains>

TRANSPORT FOR ALL – Accessible, affordable, integrated and accountable

Investment in transport isn't just about infrastructure. Public transport plays a vital role in reducing inequality and providing mobility for many people, particularly those on low incomes, enabling them to better participate in society. A House of Commons Select Committee report has found that problems with transport provision and the location of services can reinforce social exclusion and that accessibility is worsening, driven by tight budgets in central and local government.²² It recommends that **the social value of transport needs to be explicitly considered in policy-making and in the planning system.**

The Equality Trust has also highlighted how our transport system can be a driver of inequality and finds that the richest 10% of households receive almost double the transport subsidy of the poorest 10%.²³ It recommends that the Department for Transport, and all other government departments, should review the net effect of their existing policies as a whole on inequality.

Unite also recognises the importance of Community Transport Services and the role they play in delivering a more accessible and inclusive transport system. Concessionary travel is an important part of ensuring equality of access to transport and **concessionary travel policy should ensure that anybody unable to make use of their concession on existing eligible transport services should be permitted to use it on other transport services.** This fair level of service for excluded individuals must not adversely affect the level and quality of service enjoyed by existing passengers.²⁴

Government needs to ensure that public transport fulfils its important social function by being accessible, affordable, integrated and accountable.

Accessible

Public transport has an important part to play across a range of key areas, such as health, social care and employment; for example, connecting people to sport and leisure facilities, ensuring people without access to a car are able to reach health facilities, enabling older and disabled people to retain their independence, and widening employment opportunities for unemployed people.²⁵ It also matters to young people where changes in government funding of transport can have a dramatic impact.²⁶ Rural transport and subsidised travel to remote areas and islands also need to be protected.

Women are more dependent than men on public transport. Only 30% of women have access to a car in the day time.²⁷ Passengers carrying children in pushchairs or shopping (most usually women) need adequate storage space.



²² *Transport and accessibility to public services*, House of Commons Environmental Audit Committee (2013) - <http://www.publications.parliament.uk/pa/cm201314/cmselect/cmenvaud/201/201.pdf>

²³ *Taken for a Ride*, Equality Trust (2015) - <https://www.equalitytrust.org.uk/taken-ride-how-uk-public-transport-subsidies-entrench-inequality>

²⁴ <http://www.ctauk.org/policies-legislation/concessionary-travel.aspx>

²⁵ See, for example, *Total Transport: working across sectors to achieve better outcomes* (pteg, 2011) - <http://www.pteg.net/NR/rdonlyres/E963D5DA-346A-4CBA-B7DB-569488F07AF7/0/20110627ptegTotalTransportforWebFINAL.pdf>

²⁶ *No Entry! Transport Barriers facing Young People* (Intergenerational Foundation (2013) - http://www.bettertransport.org.uk/sites/default/files/research-files/No_Entry_final_report_definitive_0.pdf

²⁷ *Valuing the Social Impacts of Public Transport*, DfT (2013) - https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/226802/final-report.pdf

Vehicles must be designed to prioritise safety, accessibility and protection of the environment. But accessibility is not only about vehicle design. It is about bus drivers having the time to pull up close to the kerb at bus stops, and to wait until passengers sit down before they move off. But when buses are scheduled for maximum profits these needs are ignored.

People not only want to feel safe, they want to feel secure. The removal of guards from rail and underground services and stations has left passengers feeling more anxious about personal security. Fears over staffing cuts suggested in the McNulty Review into Rail²⁸ and through 'savings' the Government wants rail companies to make only serve to increase that anxiety.²⁹

We need to plan and run public transport in a way which makes it positively accessible to everyone. **This can only happen if transport policy makers properly consult with passenger groups and user organisations as well as transport unions. Research needs to be commissioned into the adequacy of safe accessible public transport for disabled people and their experience of using these services.**

Wheelchair users should be given an automatic legal right to a designated space on public transport.

Unite welcomed the previous Government's decision not to proceed with the abolition of the Disabled Persons Transport Advisory Committee (DPTAC) and to retain it as the Department for Transport's expert advisory panel on accessibility issues relating to disabled people. **DPTAC should now include, a previously, trade union representation on the committee.**

Affordable

Unite opposes cuts to concessionary fares for young, older and disabled people.

Rail fares have risen nearly three times faster than wages since 2010.³⁰ The Conservative/Lib Dem Coalition Government's Rail Fares and Ticketing Review failed to properly deal with high rail fare increases. The Government has announced plans to cap rises in regulated fares at the Retail Price Index (RPI) measure of inflation for this parliament. But the Department for Transport's own figures reveal the cost of the cap to taxpayers will be £700m³¹

Unite welcomed the Labour Party's 2015 Manifesto commitment to introduce **a strict fare rise cap on every route for any future fare rises, and for a new legal right for passengers to access the cheapest ticket for their journey.**

Government needs to restore the ban on train companies averaging out increases across a basket of fares.



The Government is also enabling train operating companies to increase many fares further through new longer franchises. For example, the new West Coast Inter-City franchise allowed the train operator to increase fares by up to 8% above inflation for 2013 and 2014 and then 6% above inflation increases every year for the rest of the fifteen year franchise.

Research commissioned by Action for Rail shows that public ownership could save £1.5bn over the five years to 2020, with savings passed on to passengers and taxpayers – season tickets alone could be 10 per cent cheaper by 2017.³² A third of the savings (£520m) would come from recouping the money private train companies pay in dividends to their shareholders.

Bus fares in the metropolitan areas have followed an upward trend in real terms since deregulation in 1986. The DfT bus fares index shows that since 2005, this trend has accelerated with bus fares in metropolitan areas increasing at more than twice the rate of inflation. Quality Contracts (which are discussed in more detail in the section on 'Challenging privatisation and deregulation') can help to address these problems by giving local authorities the power to set affordable prices.

Cuts have been made to the Bus Service Operators Grant (BSOG). BSOG helps to lower the cost of providing services, resulting in lower fares, a more comprehensive network of services, less congestion on our roads and a better and healthier living environment in our communities. BSOG generates at least £2.80 of benefits for every £1 of public money spent. Around half the benefits accrue to other road users and society at large through decongestion, reduced accidents, less pollution and improved productivity.³³

There must be no further cuts in BSOG which are having damaging and wide-ranging consequences for local communities, public transport services, low-income groups, the UK economy and the environment.³⁴

The UK charges passengers more in aviation tax than any other nation, to the extent that it can add several hundred pounds to the cost of a flight. This level of taxation is in addition to the requirement to pay for carbon credits under the European Emission Trading Scheme (ETS). This tax burden excludes some families from air travel and the opportunity to visit friends and relatives in other nations. It is now cheaper to travel by car and ferry to rival European hubs to catch a flight to destinations in India, Africa, the Caribbean and further afield than it is to pay this tax.

Integrated

A really effective and efficient transport system needs to be properly integrated. The idea of an "integrated transport policy" is not just jargon. All transport systems are interdependent. Bus networks need to interlink with rail networks or park and ride systems. Public transport requires transferrable ticketing and access to properly regulated taxis. Ports and airports need good road and rail links. Road, rail and water must work together to get people and goods to their destinations, cheaply, safely, efficiently and sustainably. Developments in port-centric logistics and airport location, for example, have an impact throughout the transport system.

Long term planning is essential. Strategic investment decisions and planning should be concerned not only with the speed and efficiency of the transport system, but whether it serves the actual needs of transport users. They should be concerned with the wider effects of transport on the local and national economy and with its effect on the environment.



²⁸ <https://www.gov.uk/government/publications/realising-the-potential-of-gb-rail>
²⁹ <http://www.independent.co.uk/news/uk/crime/rail-staffing-cuts-blamed-for-shocking-increase-in-passengers-being-attacked-on-britains-trains-10416174.html>
³⁰ <http://actionforrail.org/campaigners-protest-as-fares-rise-nearly-three-times-faster-than-wages/>
³¹ <http://www.parliament.uk/business/publications/written-questions-answers-statements/written-question/Commons/2015-05-27/96/>

³² https://www.tuc.org.uk/sites/default/files/TUC%20summary%20TfQL%20analysis%20March%202015_0.pdf
³³ <http://www.pteg.net/NR/rdonlyres/5F26BBD3-C4A4-4052-A453-D5BFE5E0F0B8/0/ptegCaseforbusreportFINAL.pdf>
³⁴ <http://www.bettertransport.org.uk/campaigns/save-our-buses>

Integrated transport needs proper planning. **Institutions with appropriate powers need to be established at national, regional and local level to co-ordinate strategic transport planning and deliver an integrated transport system.**

Accountable

Privatisation and deregulation have made transport services less accountable to the public. Private companies are accountable to their shareholders and privatisation places decision making in the hands of business and out of the control of public bodies and democratic institutions.

Transport decisions need to be taken at the appropriate level and through institutions that reflect the wide range of transport interests including passengers, community groups, unions, transport operators, local authorities, and environmental groups. Transport also requires a strong national transport authority capable of co-ordinating national strategic transport planning.

Unite recognises the role that Integrated Transport Authorities and Passenger Transport Executives can play in co-ordinating transport across regions and is keen to explore how these can best be developed.

Unite notes the Government's proposals concerning the regional devolution of transport powers announced in the Queen's speech 2015, including the Cities and Local Government Devolution Bill and the Buses Bill, which may provide for more effective oversight and control.

However, in the context of large scale public spending cuts, we are concerned that devolution could be seen as a means of transferring the responsibility for cuts to public services and public spending away from central government. For devolution to work, appropriate resources need to be put in place.

In addition, 'devolving' transport powers should not result in the damaging fragmentation of public networks or compromise the need for a properly accountable and integrated transport system.

PROMOTING PUBLIC TRANSPORT – Challenging privatisation and deregulation

An accessible, affordable, integrated and accountable transport system requires better regulation.

Privatisation and deregulation have damaged key parts of our transport sector. There needs to be a fundamental shift in transport policy away from further privatisation and deregulation and towards more public ownership and accountability, including our railways and our bus services.

In addition to the UK Government's privatisation agenda, Unite opposes the European Commission's drive towards further privatisation of transport through sector specific initiatives (such as 'Rail Package 4' and 'Ports Package 3') as well as more general measures such as the Concessions Directive.

Reregulation of buses

The privatisation and deregulation of bus services has led to falling passenger numbers, poorer quality services, 'bus wars' and high prices, and a lack of 'all operator' tickets in many areas.

Deregulation of the bus industry outside of London has not served communities well and whilst the regulated model in London has worked better, it is also flawed.³⁵

Public ownership of our buses would create a more integrated network of properly regulated bus services which would be run for the benefit of passengers rather than to provide excess profits for operating companies. It would lead to greater accountability, improved reliability and better value for money.

Whilst striving towards the ultimate goal of public ownership, the use of 'Quality Contracts', made possible by the Local Transport Act 2008 introduced by the last Labour Government, is a real opportunity to repair some of the damage done by deregulation and give more control to communities.

A Quality Contract involves replacing existing deregulated bus markets with a franchising system where the local transport authority specifies what the bus network will provide and the private sector operators tender to provide it. It gives local authorities the power to determine service delivery, set affordable prices and stipulate decent terms and conditions for bus workers.

As of yet no Quality Contracts have been established because operators do not want to surrender control over their profit margins. In addition, many local authorities are using Quality Contracts as a threat to make operators agree to inferior 'Quality Partnerships'. At the time of writing we wait with interest to see the outcome in Tyne and Wear of the Quality Contracts Board decision on whether to proceed with a Quality Contract.

Government should breakdown the obstacles surrounding implementation of Quality Contracts.

Unite notes the Government's proposals concerning the regional devolution of transport powers including the Cities and Local Government Devolution Bill and the Buses Bill. The Buses Bill would provide the option for combined authority areas with directly elected Mayors to be responsible for the running of their local bus services.

³⁵ <http://unitelive.org/londons-bus-workers-see-red/>

However, as mentioned earlier, in the context of large scale public spending cuts, **we are concerned that devolution could be seen as a means of transferring the responsibility for cuts to public services and public spending away from central government. For devolution to work, appropriate resources need to be put in place.**

Establishing independent evaluation of the impact on central funding of local government across the country with **the Office for Budget Responsibility should be required to produce 'state of the regional economy' reports**, stating levels of employment, deprivation and social hardship, thereby making it clear what baseline City Regions will be working from. City Regions should be judged on how they improve the situation that they inherit, rather than simply taking the blame for central government cuts.

Whilst managing change and transition between sectors, **full implementation of information and consultation and TUPE must be adhered to** at all times if bus workers and the travelling public are going to have faith in this system.

Public ownership of rail

The Government's plans for rail amount to another attempt to dismantle a key service in the pursuit of private profit at the expense of passengers and staff. This is the same ideology that led to the disastrous privatisation of the railways and seems designed to appease the interests of privatised train operating companies.

Rail franchising has proved to be fundamentally flawed and unsustainable with train operating companies (TOCs) gaining billions from taxpayers' subsidy.³⁶ The West Coast debacle³⁷ has shown the flaws inherent in rail franchising and has wasted millions of pounds of taxpayers' money.

A report by experts from the University of Manchester finds that rail privatisation has amounted to a 'great train robbery' and that the privatised rail system relies upon billions of pounds of hidden subsidies and has failed to bring in private investment.³⁸ It says that direct public expenditure on rail has more than doubled since privatisation and is currently running at £4 billion a year, despite fair rises which are now higher than in other major European countries.

The Government's pursuit of its privatisation agenda includes the privatisation of the East Coast Mainline. This is despite the fact it was working well in public ownership and since 2009 returned over £1 billion to the taxpayer.³⁹

Its ideological opposition to public ownership is limited to the UK, for whilst the government-owned company running the franchise was excluded from bidding, foreign state-backed railways were not. It is indeed "bizarre that Tory Ministers have no problem with a government-run railway service as long as it isn't British."⁴⁰

Unite welcomes the announcement by shadow transport secretary, Lilian Greenwood, that "it is time for our railways to be run under public ownership, in the public interest, with affordable fares for all".⁴¹

Further fragmentation will reduce efficiency leading to poorer services and higher fares. It will also have an adverse impact on the ability of the railways to contribute to economic growth and the reduction of carbon emissions. Unite opposes attempts to further fragment and privatise the rail system.

Public ownership of the railways would introduce efficiency from a more integrated and simplified system for passengers, increasing accountability and transparency.

A report by Transport for Quality of Life finds that £1.5 billion could be saved over the next five years (2015 – 2020) if routes, including the Northern, Transpennine and West Coast Main Line, were operated by the public sector. The Treasury would also be able to pass on massive savings to commuters in the form of far cheaper tickets.⁴²

Unite welcomed Network Rail being taken back under public ownership and is concerned at reports that the review being conducted by Nicola Shaw could lead to its re-privatisation.⁴³ **Unite opposes any proposal to break up Network Rail or attempts to privatise it.**

The Government should:

- **bring train operating companies back into the public sector** (which can be done at no cost as franchises expire or fail);
- **keep Network Rail in public ownership;**
- **shift from the expensive and wasteful rolling stock leasing system to buying trains outright and using government purchasing to support UK train manufacturing.**⁴⁴

Unite and the European Transport Workers Federation have also been active in highlighting the damaging consequences of the 'Rail Package 4' legislative proposals from the European Commission which will obstruct public ownership by requiring governments to put out to tender all passenger services.

Investment and regulation in ports and waterways

The UK's docks, ports and waterways are important parts of its transport system. Unite opposes the EU's 'Ports Package 3' proposals which aim to further drive liberalisation and would lead to a 'race to the bottom'. **These vital links to Europe require adequate investment and should not be put in the hands of those who might strip and sweat long term assets at the expense of the travelling public and British commerce.**

The move to ever larger ship sizes by shipping lines is focussing demand for more tugs whilst reducing the number of times they have work in any period. Together with increased competition from new tug operators, margins are being squeezed to the detriment of crew. Smaller ports are also losing traffic to the larger ports that are able to cope with the deep draft clearance of these ships leaving them dependant on short sea services.

The plight of smaller container ports is made worse by the numerous additional large port projects that are opening which has created significant over capacity and competition between ports for the shipping lines. At the present time, Unite therefore opposes any new deep sea port developments.

The canal network provides the opportunity to develop an environmentally friendly method of moving goods in certain regions. In addition, the network provides social and leisure benefits to many communities. However, the move of British Waterways in England to the charity sector has seen a weakening of attention paid to freight. **There should be no further transfer of the ownership of the canal network into a charity or to the private sector.**



³⁶ <http://www.tuc.org.uk/industrial/tuc-21519-f0.cfm>

³⁷ <http://www.guardian.co.uk/uk/2013/feb/26/mps-west-coast-mainline-department-transport>

³⁸ *The Great Train Robbery: Rail Privatisation and After*, Centre for Research on Socio-Cultural Change (2013) - <http://www.cresc.ac.uk/sites/default/files/GTR%20Report%20final%205%20June%202013.pdf>

³⁹ <http://actionforrail.org/the-attack-on-our-railways/keep-east-coast-public/>

⁴⁰ <http://press.labour.org.uk/post/62143017426/maria-eagle-mps-speech-to-labour-party-annual>

⁴¹ <http://press.labour.org.uk/post/130124189799/speech-by-lilian-greenwood-to-labour-party-annual>

⁴² https://www.tuc.org.uk/sites/default/files/TUC%20summary%20TfQL%20analysis%20March%202015_0.pdf

⁴³ <http://www.theguardian.com/business/2015/sep/20/network-rail-privatisation-under-consideration-amid-budget-crisis>

⁴⁴ <http://actionforrail.org/our-alternative/>

Better regulation of taxis

The previous Coalition Government asked the Law Commission to look at the possibilities for deregulating the taxi industry. This is despite the Transport Select Committee recommending that instead of referring reform to the Law Commission the Government should engage with the trade, local authorities and users about the objectives of future legislation on taxis and private hire vehicles.⁴⁵

Unite opposes further deregulation of the taxi industry and believes Local Taxi Boards made up of the licensing authority, trade unions, the police and passenger representatives (including disability and women's safety groups) should be responsible for the monitoring of supply and demand with the remit of developing the trade in a progressive and managed way.

Regulating private hire apps

Some private hire apps allow users to request a vehicle directly to their location at the press of a button with the fare being calculated and debited from a bank account automatically via a smartphone.

Unite believes that showing the position of vehicles on the app before the booking is made is a virtual hailing, effectively allowing plying for hire by private hire vehicles. This encourages private hire vehicles to park and wait for a booking, often illegally and to the frustration of residents and other road users.

Unite believes that it is wrong to allow private hire booking apps to display the location and estimated time of arrival (ETA) of vehicles on the user's phone before the booking is made. This is 'virtual' plying for hire without the vital safeguards to passengers that are in place for taxis with the local knowledge. Private hire booking apps should not be able to undermine progressive planning and safety in this industry through showing before any booking is made the position of available vehicles and the estimated time of arrival.



Cap on Private Hire Drivers and Vehicles in London

Unite believes a cap on private hire drivers and vehicles in London is overdue. The situation has led to greater congestion on London's roads, more air pollution and increased the problem of illegally parked vehicles. It has also damaged the livelihoods of the Hackney Carriage trade and made the streets of London more unsafe due to enforcement being over stretched.

Regulation of airports

In aviation, the Competition Commission forced through the break-up of BAA under the premise of introducing competition between airports. But a dependence on competition alone has not worked and the CAA has threatened the airports with caps on the amount they can charge airlines for landing fees increasing control over their activities.

In addition, the provision of aviation capacity through private airport operators has failed to deliver a coherent and cohesive strategy for aviation in the UK, thus inhibiting the fullest development of a key area of transport infrastructure and therefore curbing the potential benefits for the UK economy.

⁴⁵ <http://www.publications.parliament.uk/pa/cm201012/cmselect/cmtran/1507/1507.pdf>

Unite supports the adoption and implementation of an integrated policy for aviation which would be articulated nationally, internationally, and with other modes of transport. Key features would include a vibrant and self-sustaining regional aviation policy, combined with the continued presence and development of an international hub airport at Heathrow (as recommended by the Airports Commission). Such a policy would potentially combine a mix of public and private investment with a strong regulatory framework which would compensate for the lack of long term strategic decision making resulting from the 'free market' approach currently adopted.

A public road transport network that is safe and sustainable

The Government is moving towards privatising our road network including commercialisation of the Highways Agency which has now been rebadged as Highways England as a so called "go-co" government owned, contractor operated company. **Unite opposes the privatisation of our roads which are an integral part of our transport infrastructure.**⁴⁶ It makes no economic or environmental sense⁴⁶ and puts a key part of our infrastructure in the hands of companies seeking profits. Road pricing cannot operate in isolation from an integrated transport policy, including an understanding of the role of the road transport industry as part of a wider integrated transport policy including cycling and walking. Additionally, road pricing that charges drivers for using city centre roads would mean that those who can afford it are allowed to pollute.

The HGV levy in its first year of operation has raised a total £192.5 million in revenue, with £46.5 million from foreign-registered vehicles and £146 million from UK-registered vehicles. Revenue raised by the HGV levy is paid into the Consolidated Fund. It is not specifically ring fenced for transport infrastructure. Unite believes the **Government should ring fence HGV levy revenue in order to create a safe and sustainable transport infrastructure which improves, repairs and expands our roads.**

Any collection of payments by operators of non-uk registered HGVs should not be given to private contractors. There are maximum limits for road charging set through Europe so any increases would have to be linked directly to them. The **Charging levels must comply with the Eurovignette Directive** (Directive 1999/62/EC as amended by 2006/38/EC and 2011/76/EU) which sets out a framework of rules for tolls and charges, including maximum daily rates for the latter. **Unite is keen to ensure that the Government abides by this directive.**



⁴⁶ <http://www.taxresearch.org.uk/Blog/2012/03/19/the-madness-of-road-privatisation/>

SAFE TRANSPORT

Health and safety is a key concern across transport. Effective health and safety must not be a casualty of the economic crisis through the Government's pursuit of cuts and deregulation. Unite strongly condemns the Government's deregulatory agenda and the erosion of workers' rights and health and safety protection, including the scrapping of some health and safety regulations and HSE approved codes of practice (ACOPs), and the dilution of other ACOPs and HSE guidance. Unite does not accept the Government's downgrading of the transport sector as "lower risk".⁴⁷

Investment in transport must also mean that it is equipped to meet the highest safety standards. **EC directives and legislation on transport should be set to the highest standards operating within member states, without being unnecessarily complicated. Tri-partite transport sector developments at the ILO International Labour Organisation agreed by governments, unions and employers are also important.**

The safety of transport users is closely linked to the safety of transport workers. For example, Unite is calling for **proper implementation of the European driving hours regulations in the UK where bus drivers in the UK** are driving for longer periods and over greater distances than their European counterparts.⁴⁸ This is not only a matter of concern for bus drivers but for public safety on our roads.

The safety and health of transport workers is being adversely affected by the lack of adequate toilet and washing facilities, which has been made worse by the closure of many public facilities. **Professional drivers must have access to high quality, clean, safe and secure washing facilities throughout the road network.**

Long working hours and inappropriate rest facilities are an issue in other areas too. For the country's HGV drivers, loopholes in the Working Time Directive (in respect of periods of availability, for example) are promoting a 'long hours' culture. Excessive working time is also a reflection of inadequate pay and a reduction in working hours should not compromise decent pay. Unite is campaigning for better enforcement of drivers' working hours rules and has also put forward a 'model' truck stop facility.⁴⁹ In civil aviation, we have highlighted the dangers to staff and passengers of inadequate rest periods. **Safe transport requires proper rest periods and rest facilities for transport workers such as drivers.**

Another issue is drivers' cabs which, despite being their working environment, are still not deemed to be their workplace. **Drivers' cabs should be brought under the provisions of the relevant health and safety legislation.** The use of technology-driven Labour Management Systems in warehousing, logistics and to excessively monitor transport workers is leading to increasing levels of work intensification, stress and mental health issues.

There needs to be protection against fatigue for transport workers, particularly in road transport and civil aviation, through stronger regulation and proper enforcement of driving, working and duty hours, including ending the abuse of Working Time Regulations by unscrupulous employers through 'periods of availability'. The impact of related stress and mental health issues in the transport sector needs action.

Safe loading procedures in all modes of transport are also essential for passenger and transport worker safety. They should not be compromised in a 'race to the bottom' to cut costs.

Unite has also drawn attention to the mounting concern about exposure of diesel exhaust emissions as a workplace health and safety and public health issue. **The Government should act upon the upgrading by the International Agency for Research into Cancer of diesel engine exhaust to a Group 1 carcinogen - carcinogenic to humans – and ensure that health and safety regulatory activity fully and actively reflects this finding.**

Unite and others have also raised concerns about the effect of exposure to carcinogenic compounds in aviation both on board aircraft and on the ground.⁵⁰ **Government should act on these concerns.** Unite is also campaigning on air quality on aircraft and in airports, including the effects of ultrafine particles, and the weight, movement and stowage of passenger luggage.

Concerns about a race to the bottom in terms of employment conditions and health and safety were vividly drawn to the public's attention by Unite's downstream oil distribution driver members in 2012. Unite's action has led to the introduction of a 'Petroleum Drivers' Passport (PDP)' (see further details in section on 'Decent employment standards' below). By contrast, Unite has still to gain recognition at the deep-sea container port in the Thames estuary, the London Gateway, despite the fact union recognition reinforces health and safety issues.



Petroleum Driver Passport

Docks remain one of the most dangerous industries to work in. Unite is leading in highlighting the serious consequences of the Coalition Government's downgrading of the safety level of docks and the scrapping of the Docks Regulations.

Unionised workplaces with active health and safety representatives are safer workplaces⁵¹ and the importance of safety to the success of transport should be reflected in the **support and rights available to union health and safety representatives including the ability for 'roving' health and safety reps to cover a number of places of work. Workplaces need health and safety cultures which encourage the reporting of concerns by workers without fear of victimisation or financial loss.**



⁴⁷ See page 9 of *Good Health and Safety, Good for Everyone*, DWP (2011) - <http://webarchive.nationalarchives.gov.uk/+/http://www.dwp.gov.uk/docs/good-health-and-safety.pdf>

⁴⁸ <http://www.unitetheunion.org/uploaded/documents/BusSaferWay11-3896.pdf>

⁴⁹ The *Unite Professional Drivers' Handbook* contains details about key European and domestic health and safety rules and issues including drivers' hours and tachograph matters

⁵⁰ <http://www.unitetheunion.org/news/unite-chief-in-public-inquiry-call-to-allay-health-fears-over-cabin-air-safety/>

⁵¹ *The Union Advantage*, TUC (2014) - https://www.tuc.org.uk/sites/default/files/TUC_UnionADV2.pdf

DECENT EMPLOYMENT STANDARDS

The value of unions and union representatives is widely recognised in ensuring decent and fair standards in a range of areas in addition to health and safety. Transport workers' experience of the deregulation and liberalisation of the sector is an undermining of standards, a 'race to the bottom' and attacks on trade union organisation. Trade unions act as an important safeguard against free markets and unscrupulous employers.

Unions need to be involved in issues that affect work organisation such as the development of large transport hubs and the introduction of new technology to ensure that safety, service and well-being are not compromised by pressure to cut costs and a 'race to the bottom'.

The transport sector is also subject to a rise in precarious employment through practices such as zero hours contracts and outsourcing. Migrant workers and agency workers are subject to unfair treatment. For example, some employers in areas such as road haulage are, in conjunction with agency business, avoiding giving equal treatment on pay to agency workers through the use of so-called 'Swedish Derogation' contracts.

Government should remove all loopholes in the Agency Workers Regulations and ensure they are properly complied with and not circumvented through practices such as 'Swedish Derogation' contracts and zero-hours contracts.

In road transport, cabotage regulations need to be properly enforced and EU pressure for further deregulation needs to be resisted.

Unions ensure employment rights are not only enforced, but that steps are taken to prevent problems and promote fair and decent standards and treatment. This includes extending workers' access to learning and skills, fair and safe work organisation and working time, productivity and pay, pensions, procedures for sickness, holidays, family friendly policies, discipline and grievance. Such actions can reduce labour turnover and absenteeism, make workplaces - and society more broadly - fairer and more equal, and improve job satisfaction and employee engagement.⁵²

This Conservative Government continues to pursue an ideologically driven anti-union agenda that has sought to undermine the effectiveness of unions through attacks on employment legislation and trade union

facility time. This is no better illustrated than by the Trade Union Bill with its attacks on the ability of working people to defend and improve their working conditions⁵³ including attacking the right of transport workers to take strike action. **Unite opposes the undermining of basic rights and freedoms in the Trade Union Bill.**

Transport needs a properly protected workforce and this requires proper protection and facilities for trade union representatives.

Unite condemns the blacklisting and victimisation of trade unionists by employers. **Government policy should strive to stamp out blacklisting activities and blacklisting should be publicly repudiated by those awarding and competing for contracts in the transport sector. No public contracts should be awarded to those engaging in such practices.**

Unite's efforts to promote stability, security and responsibility in the transport sector include dealing with the fragmentation of the fuel oil distribution industry and has led to the introduction of the 'Petroleum Drivers' Passport' (PDP), which now covers over 6,000 tanker drivers across England, Scotland and Wales and establishes an Industry Training Standard for health, safety and driver training, with appropriate means of accreditation.⁵⁴ The training is a mixture of classroom and practical learning. The passport is renewed on a five year cycle, but also has an annual refresher requirement and will see fuel depots and refineries refusing to load tankers whose drivers do not hold a PDP.

Unions have a positive impact on skills and training, particularly where there are union learning representatives (ULRs). Union recognition has a consistently positive effect, not only to the extent that employees are provided with training but also on the amount of training received.⁵⁵

Unite has successfully negotiated with many employers for drivers to be paid whilst conducting Driver Certificate of Professional Competence (CPC) training. There is no legal requirement for employers to do so and some employers pay for the training itself but not their drivers' working time whilst undergoing training. In the absence of a formal framework for workers' representatives, employers and government to develop this, Unite has also been delivering its own Driver CPC training to members. Unite would also be supportive of initiatives from relevant governing bodies to introduce a Warehousing CPC.

Government and industry should fund real training initiatives which will promote real skills, equal opportunities, and improve future transport efficiency and safety. We need properly regulated National Professional Standards and trade union involvement in all training bodies.

Compulsory Driving Licence Checks

It is a legal obligation for an operating licence holder to ensure that drivers they employ are eligible to drive. For most this is not a problem, but since the abolition of the driving licence paper counterpart in June 2015 some employers have had to revisit their procedures.

Information held by DVLA regarding driving entitlements or endorsements is personal data covered by the Data Protection Act 1998 and there are rights over who can access that information and for what reasons. Employers may have a legal obligation to check eligibility to drive and may request evidence. Unite has issued guidance on driver licence checks and the need to consider the safety of personal data.⁵⁶ In many companies Unite members are covered by an existing agreement which is working. However, **agreements on compulsory driving licence checks should be updated periodically, especially relating to who can access the information, how the information is stored and for how long.**



⁵² *The Road to Recovery*, TUC (2010) - <http://www.tuc.org.uk/economy/tuc-17727-f0.cfm?themeaa=touchstone&theme=touchstone>
⁵³ <http://www.unitetheunion.org/uploaded/documents/Trade%20Union%20Bill%20Briefing%20Paper11-23961.pdf>

⁵⁴ <http://www.unitetheunion.org/how-we-help/list-of-sectors/road-transport-commercial-logistics-and-retail-distribution/the-petroleum-driver-passport-scheme/>

⁵⁵ *The Union Advantage*, TUC (2014) - https://www.tuc.org.uk/sites/default/files/TUC_UnionADV2.pdf

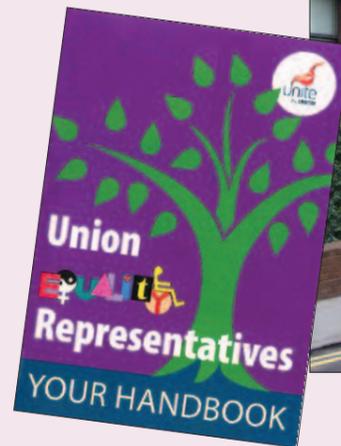
EQUALITY AND PROTECTION FROM VIOLENCE FOR TRANSPORT WORKERS

In addition to the importance of transport to equality in society and to access for disabled people, there are important equalities issues for workers in the transport sector, which are also important to the diversity of passengers and the public generally.

The transport and storage sector already has one of the worst records of employing women, with men accounting for 80 per cent of the sector workforce compared to 54 per cent across the economy. It is also one of the most poorly qualified.⁵⁷ Training and regulation are vital in guarding safety and as an investment in skills for the future. Closure of training not only hits skills but equal opportunities.

Unite has supported and led initiatives in this area, including:

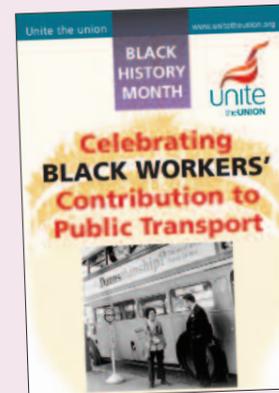
- tackling under-representation of women workers in bus, rail and road haulage;
- tackling barriers to progression faced by black, Asian and ethnic minority workers in transport;
- supporting positive action training, including basic skills and language training;
- dignity at work, action on violence against women and against all transport workers, including recognition of cabin crew as safety and security professionals;
- training for transport workers on disability awareness and action including mental health at work;
- ensuring travel concessions apply to same sex partners of transport workers without discrimination;
- trade union and employer training on equal opportunities, equality impact assessments and audits;
- negotiating agreements for a plan of action to support trans workers in transport;
- promoting rights for union equality representatives.



The transport sector's poor record on employment levels for women and black, Asian and ethnic minorities (BAEM) needs positive workplace policies that support women's participation and BAEM progression. This includes family friendly policies and better scheduling of work patterns (which would also assist male parents and carers and reduce stress) and positive training opportunities.

Union equality representatives play a vital role recognised by a number of transport employers as well as by ACAS and the Women and Work Commission. In order to ensure fairness and equality at work, union equality reps should have statutory rights to paid time off and facilities.

Clear confidential procedures supported by union education and workplace awareness are vital in preventing and dealing with harassment, bullying and violence in all forms. Action on white ribbon day, 25th November 'Say No to Violence against Women', and in Black History Month, for example, have an important part to play.



Jeff Hurd, reportdigital.co.uk



Roy Peters, Roy Peters Photography

⁵⁷ www.ukces.org.uk/assets/ukces/docs/publications/briefing-paper-ssa12-transportation-storage.pdf

A MORE SUSTAINABLE TRANSPORT SYSTEM THAT IS BETTER FOR THE ENVIRONMENT

Transport accounts for around 21% of UK greenhouse gas emissions, with road transport, and passenger cars in particular, the most significant source of emissions in this sector.⁵⁸

Reducing greenhouse gases from transport will be a major part in meeting the UK's commitment to reducing greenhouse gas emissions by 80% compared to 1990 levels by 2050. This will not only require action to 'decarbonise' transport and develop emission reducing technologies, it will also depend on persuading people to make travel choices that are less environmentally damaging.⁵⁹

Initiatives to reduce emissions must also have proper regard for health and safety. A 10 year trial into the use of high volume semi-trailers on Britain's roads has so far resulted in a lower than expected take up and initial evaluation reports that there is not yet sufficient data to perform any meaningful analysis.⁶⁰ Unite is concerned that due to increased length there is an associated increased risk to workers and members of the public when these vehicles are manoeuvring.

As mentioned in the foreword, there is a clear international dimension to dealing with global climate change and Unite is working with the International and European Transport Workers' Trade Union Federations (ITF and ETF) to promote a coordinated approach to sustainable transport initiatives across countries, including the Climate Justice and Trade Union Vision on Sustainable Transport projects.⁶¹

The ITF is committed to representing the joint interests of transport workers to secure a just transition to a sustainable transport system based on secure jobs, good wages and decent working conditions.⁶² Whilst we recognise that we cannot think in isolation, this should not prevent the UK from taking a lead or addressing its own challenges.

Regulation and procurement practice needs to support a sustainable transport industry by enabling longer term considerations, and ensuring social and environmental goals as well as economic growth.

Investment is needed to support research into technology for minimising the pollution effects of transport, such as cleaner fuels and electric cars, which is important to communities and transport workers.

In aviation many nations are exploring biofuel alternatives from non-agricultural sources that do not reduce the amount of land used for food production or destroy the rain forests.



Unions also have a particular role to play in promoting and delivering a sustainable environment through environmental representatives and 'green workplace' initiatives. At the Port of Felixstowe, for example, Unite has been active on environmental issues with the senior union steward and environment representative sitting on a joint union-management environmental committee whose work has led to a reduction in the port's carbon footprint and increase in its recycling rate.⁶³ Work has also included supporting green travel, again with union representation on the port's Travel Steering Group.

The union role in delivering a sustainable environment needs to be supported through statutory rights for training and facility time for all trade union environment reps.

But there also needs to be a move towards a transport system based on much greater use of public transport, cycling and walking. Disincentives to car use will only be effective or fair when there is a low-cost, clean, safe and convenient public transport alternative and active support for cyclists and pedestrians.

Unite supports aviation's inclusion in the EU Emissions Trading Scheme (ETS) which applies to every airline calling at a European airport. However, the scheme can provide a financial advantage to transatlantic routes that avoid Europe and emit more greenhouse gases. Consequently, Unite believes that **there should be a global emissions trading scheme for civil aviation. The introduction of aviation ETS should lead to the abolition of Air Passenger Duty (APD) as it has done in other European states.** If APD is to be maintained, however, then the revenue stream should be hypothecated and used for environmentally friendly civil aviation projects, i.e. research and development and implementation of new operational practices and technology. There should also be a harmonised application of APD throughout the UK.

The free-for-all of the cabotage market within automotive delivery in road haulage, which will see non-UK registered hauliers from continental Europe 'running empty' for longer, should be replaced with **a planned and intermodal freight strategy based on environmental and economic efficiency.**

Sustainable transport requires proper planning. It also requires investment, effective regulation, smart procurement policy and better integration of transport modes. All of these issues are considered in more detail elsewhere in this report, but this further demonstrates the need for government to have a comprehensive and clear transport strategy that connects relevant policy areas.

⁵⁸ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/407432/20150203_2013_Final_Emissions_statistics.pdf

⁵⁹ *British Social Attitudes 2012 - Transport*, <http://www.bsa-29.natcen.ac.uk/read-the-report/transport/introduction.aspx>

⁶⁰ Evaluation of the High Volume Semi-Trailer Trial: Annual Report 2012, Report for Dft by Risk Solutions (2013) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/204084/hvst-trial-annual-report-2012.pdf

⁶¹ <http://www.itfglobal.org/policy/climatejustice.cfm> and <http://www.etf-europe.org/transunion-climate.cfm>

⁶² <http://www.itfglobal.org/en/resources/training-education/itf-climate-change-conference-discussion-document/>

⁶³ *Green Workplaces at Work 2012*, Labour Research Department and TUC (2012)

CONCLUSION:

SUMMARY OF KEY POINTS AND RECOMMENDATIONS

Strategy

Government needs to have a clear, integrated and sustainable transport strategy that recognises the importance of transport to society, the economy and the environment, as well as the key role played by transport workers.

This strategy should include:

- a commitment to investment;
- accessible, affordable, integrated and accountable public transport;
- a fundamental shift away from further privatisation and deregulation;
- safe transport with decent employment standards, equality and protection for transport workers;
- a sustainable transport system that is better for the environment.

Investment

- A commitment to investment. Public investment must at least match the best international levels.
- Invest immediately in modernising our transport infrastructure system to boost productivity and build a sustainable economy.
- Deliver in a sustainable and accessible way on commitments made for the high speed rail network.
- Ensure an effective hub airport in an environmentally sustainable manner and address the lack of airport capacity in London and the South East by acting swiftly on the Airports Commission recommendation for a new runway at Heathrow.
- Fair and effective procurement. Contracts must include social impact clauses and ensure fairness for British based manufacturing and the supply chain.

Transport for All

- The social value of transport needs to be explicitly considered in policy-making and in the planning system.
- Concessionary travel policy should ensure that anybody unable to make use of their concession on existing eligible transport services should be permitted to use it on other transport services.
- Ensure that public transport fulfils its important social function by being integrated, accessible, affordable and accountable for all.

Accessible

- Properly consult with passenger groups and user organisations.
- Research into the adequacy of safe accessible public transport for disabled people and their experience of using these services.
- Wheelchair users given an automatic legal right to a designated space on public transport.
- The Disabled Persons Transport Advisory Committee (DPTAC) should include, as previously, trade union representation.

Affordable

- No cuts to concessionary fares for young, old and disabled people.
- A strict fare rise cap on every route for any future fare rises and a new legal right for passengers to access the cheapest ticket for their journey.
- Restore ban on train companies averaging out increases across a basket of fares.
- No cuts in the Bus Service Operators Grant (BSOG) which are having damaging and wide-ranging consequences for local communities, public transport services, low-income groups, the UK economy and the environment.

Integrated

- Institutions with appropriate powers at national, regional and local level to co-ordinate strategic transport planning and deliver an integrated transport system.

Accountable

- Transport decisions taken at the appropriate level and through institutions that reflect the wide range of transport interests including transport unions.
- Explore how the role of Integrated Transport Authorities and Passenger Transport Executives can be developed in co-ordinating transport across regions.
- City devolution may provide for more effective oversight and control, but should not be a means of transferring the responsibility for cuts to public services away from central government. For devolution to work, appropriate resources need to be put in place.
- 'Devolving' transport powers should not result in the damaging fragmentation of public networks or compromise the need for a properly accountable and integrated transport system.
- Office for Budget Responsibility to produce 'state of the regional economy' reports.

Challenging privatisation and deregulation

- Shift in transport policy away from further privatisation and deregulation and towards more public ownership and accountability, including our railways and our bus services.
- Oppose the European Commission's drive towards further privatisation of transport through sector specific initiatives (such as 'Rail Package 4' and 'Ports Package 3') as well as more general measures such as the Concessions Directive.
- Break down the obstacles surrounding implementation of Quality Contracts.
- Bring train operating companies back into public ownership.
- Oppose any proposal to break up Network Rail or attempts to privatise it.
- Use government purchasing to support UK train manufacturing.
- Provide adequate investment in the UK's docks, ports and waterways which should not be put in the hands of those who might strip and sweat long term assets at the expense of the travelling public and British commerce.

- No further transfer of the ownership of the canal network into a charity or to the private sector.
- Local Taxi Boards made up of the licensing authority, trade unions, the police and passenger representatives (including disability and women's safety groups) responsible for the monitoring of supply and demand with the remit of developing the trade in a progressive and managed way.
- Private hire booking apps should not be able to undermine progressive planning and safety in the industry through showing before any booking is made the position of available vehicles and estimated time of arrival.
- A cap on private hire drivers and vehicles in London.
- An integrated policy for aviation articulated nationally, internationally, and with other modes of transport. Key features would include a vibrant and self-sustaining regional aviation policy, combined with the continued presence and development of an international hub airport at Heathrow (as recommended by the Airports Commission).
- No privatisation of our roads which are an integral part of our transport infrastructure.
- Ring fence HGV levy revenue in order to create a safe and sustainable transport infrastructure which improves, repairs and expands our roads.
- Any collection of payments by operators of foreign-registered HGVs should not be given to private contractors.
- The Government must comply with the Eurovignette Directive in respect of road charging.

Safe transport

- EC directives and legislation on transport set to the highest standards operating within member states, without being unnecessarily complicated. Tri-partite transport sector developments at the ILO International Labour Organisation agreed by governments, unions and employers are also important.
- Proper implementation of European driving hours regulations in the UK.
- Professional drivers must have access to high quality, clean, safety and secure washing facilities throughout the road network.
- Proper rest periods and rest facilities for transport workers such as drivers.
- Drivers' cabs brought under the provisions of the relevant health and safety legislation.
- Stronger regulation and proper enforcement of driving, working and duty hours including ending the abuse of Working Time Regulations by unscrupulous employers through 'periods of availability'. The impact of related stress and mental health issues in the transport sector needs action.
- Safe loading procedures in all modes of transport. They should not be compromised in a 'race to the bottom' to cut costs.
- Ensure health and safety regulatory activity fully reflects recent upgrading of diesel engine exhaust as carcinogenic to humans.
- Action on concerns about the effect of exposure to carcinogenic compounds in aviation both on board aircraft and on the ground.
- Maintain proper level of safety in our docks and ensure dock safety regulations.
- Support and rights for union health and safety representatives including the ability for 'roving' health and safety reps to cover a number of places of work.
- Workplaces with health and safety cultures that encourage the reporting of concerns by workers without fear of victimisation.

Decent employment standards

- Remove all loopholes in the Agency Workers Regulations and ensure they are properly complied with and not circumvented through practices such as 'Swedish Derogation' and zero-hours contracts.
- In road transport, cabotage regulations need to be properly enforced and EU pressure for further deregulation needs to be resisted.
- Oppose the undermining of basic rights and freedoms in the Trade Union Bill.
- Proper protection for transport workforce with proper protection and facilities for trade union representatives.
- Government policy should strive to stamp out blacklisting of trade unionists and blacklisting should be publicly repudiated by those awarding and competing for contracts in the transport sector. No public contracts should be awarded to those engaging in such practices.
- Government and industry funding for real training initiatives which will promote real skills, equal opportunities, and improve future transport efficiency and safety.
- National Professional Standards and trade union involvement in all training bodies.
- Agreements on compulsory driving licence checks should be updated periodically, especially relating to who can access the information, how the information is stored and for how long.
- Full implementation of information and consultation and TUPE must be adhered to.

Equality and protection from violence for transport workers

- Positive workplace policies that support women's participation including family friendly policies and better scheduling of work patterns (which would also assist male parents and carers and reduce stress).
- Union equality representatives play a vital role recognised by a number of transport employers, ACAS and the Women & Work Commission. In order to ensure fairness and equality at work, union equality representatives should have statutory rights to paid time off and facilities.
- Initiatives to encourage the progression of BAEM workers.
- Clear confidential procedures supported by union education and workplace awareness are vital in preventing and dealing with harassment, bullying and violence in all forms. Action on white ribbon day, 25th November 'Say No to Violence against Women', and in Black History Month for example have an important part to play.

A more sustainable transport system that is better for the environment

- Regulation and procurement practice to support a sustainable transport industry by enabling longer term considerations, such as social and environmental goals, to be more considered as well as economic growth.
- Investment to support research into technology for minimising the pollution effects of transport, such as cleaner fuels and electric cars.
- Statutory rights for training and facility time for trade union environment representatives.
- A transport system based on greater use of public transport, cycling and walking.

- A global emissions trading scheme for civil aviation.
- The abolition of Air Passenger Duty (APD). If maintained, then should be used for environmentally friendly civil aviation projects and there should be harmonised application throughout the UK.
- A planned and intermodal freight strategy for automotive delivery, fuel delivery and all road haulage that is based on environmental and economic efficiency.

UNITE TRANSPORT STRATEGY GROUP

Passenger Transport

National Industrial Sector Committee Chair – Taj Salam
 National Industrial Sector Committee Vice-Chair – Mike Hedges
 Executive Council Members – James Mitchell, Simon Rosenthal
 National Officer – Bobby Morton

Road Transport Commercial, Logistics & Retail Distribution

National Industrial Sector Committee Chair – Ronnie Evans
 National Industrial Sector Committee Vice-Chair – Tony Lewington
 Executive Council Members – Dave Williams, Gary Hillier
 National Officers – Adrian Jones, Matt Draper, Tony Devlin (downstream oil distribution)

Civil Air Transport

National Industrial Sector Committee Chair – Brian Norbury
 National Industrial Sector Committee Vice-Chair – John Pigott
 Executive Council Members - Sharon Owens, Nigel Stott, Jas Gill
 National Officer – Oliver Richardson

Docks, Rail, Ferries & Waterways

National Industrial Sector Committee Chair – Richard Crease
 National Industrial Sector Committee Vice-Chair – Martin Jones
 Executive Council Member – Andy Green
 National Officers – Bobby Morton, Tony Murphy (Rail)

Assistant General Secretary Transport

Diana Holland

Transport Research – John Earls (Head of Research), John Neal, Colin Potter
Equalities Research – Anooshah Farakish
National Health & Safety Adviser – Susan Murray

Support the Fair Transport Europe campaign

Fair Transport is fair competition, equal working conditions and good jobs

Unite is proud to support the Fair Transport Europe campaign being run with the European Transport Workers Federation.



As long as we cannot send an apple, a pair of shoes or ourselves by email, we need the millions of transport workers who connect Europe. But working conditions in European transport are being challenged by a race to the bottom and unfair business practices by some companies, causing deplorable conditions for workers.

Fair Transport is fair competition, equal working conditions and good jobs.

Fair Transport benefits all of us. We need your support in a call for better legislation and enforcement of regulations in Europe.

In order to do this, we need to obtain as many supporting signatures as possible.

A central tool for the Fair Transport Europe initiative is the EU instrument called the "European Citizens' Initiative" (ECI). If at least one million EU citizens sign the petition, we can call on the European Commission to make the necessary legislative proposals for more fair transport.

Let's make things better. Sign for Fair Transport.

To sign for Fair Transport and find out more about the campaign go to: www.fairtransporteurope.eu



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www.unitetheunion.org





UCL

Response to
National Infrastructure Commission's
Call for evidence:
London's Transport Infrastructure

University College London

January 2016

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1. Executive Summary

This document consolidates the response of the academic community at University College London (UCL) to the National Infrastructure Commission's call for evidence regarding future investment in London's transport infrastructure (published 13 November 2015).

In response to *Question 1) what are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?*, we noted the issues around London's housing market and demographics. Whereas London's housing market is becoming a field for financial game by investors, the potential risk would be that expensive house prices/rents would discourage young generations from coming into London, although they are in fact an engine of London economic development. A step change would be required on our approaches to these, which should be synthesised with transport planning, including use of Residential Social Landlords who do not need short-term returns but provide a platform for financially less advantaged people. A local council tax supplement could be another means.

In response to *Question 2) What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?*, this report highlights opportunities regarding orbital transport systems as well as rail systems that go beyond the traditional boundaries of London, which should be integrated to the proposed radial and through-centre systems, such as Crossrail 2. Because Train Operating Companies cannot consider investment and return beyond their franchise periods, appropriate arrangements are necessary from long-term strategic viewpoints. In addition, consolidation of existing train depots as well as multiple-platforms at the core section are suggested to maximise the benefit of the proposed Crossrail 2.

For *Question 3) What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2*, we suggest a) line-based fare surcharge, adapted in Tokyo, b) use of the Games 2012 Tax system, and c) consolidation of infrastructure development and train operation when contracting out the project. Separating station infrastructure development and maintenance from the construction of the line, and bringing private funds to the station infrastructure is one possible approach. China is experimenting privately funded metro station maintenance by local homeowners, whereas in the Maglev train line of Japan stations except termini are all funded by private companies and local governments. These are also possible approaches.

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- Prof Andrew Edkins (The Bartlett School of Construction and Project Management)
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2. Research Capability at University College London

UCL is a global research leader in the design, delivery and management of sustainable and resilient infrastructure.

UCL holds some £57M of funding, from the UK Engineering & Physical Sciences Research Council (EPSRC) alone, for research on infrastructure related challenges in the transport, energy and construction sectors. UCL's research strengths in the field are truly multidisciplinary, spanning: transport engineering, structural engineering, advanced spatial analysis and big data analytics, construction and project management, sensors and geomatic engineering, and socio-technical energy modelling and analysis. Major centres of excellence at UCL include the Centre for Advanced Spatial Analysis (CASA), the Centre for Transport Studies (CTS) within the Department of Civil, Environmental & Geomatic Engineering, the cross-Faculty Transport Institute, and the OMEGA Centre for Mega Projects in Transport & Development, based in the Bartlett School of Planning.

In the 2014 Research Excellence Framework, UCL was the top-rated university in the UK for research strength, by a measure of average research score multiplied by staff numbers submitted. It was ranked number one in the UK in the area of Architecture, Built Environment and Planning (Unit of Assessment 16), and the in top ten in the field of Civil and Construction Engineering (UoA 14).

UCL is home to the EPSRC and ESRC funded International Centre for Infrastructure Futures (ICIF), as well as the Coordination Node of the £138M UK Collaboratorium for Research in Infrastructure & Cities (UKCRIC), led by Professor Brian Collins from the Department of Science, Technology, Engineering & Public Policy (STeAPP). Announced by the Chancellor in 2015, UKCRIC spans at least 14 universities and will lead the development of a coordinated, world class, infrastructure research community in the UK. UCL will take charge of infrastructure aspects of the £10M EPSRC-funded Internet of Things Research Hub (PETRAS), announced in early 2016, as well as its overall leadership under Hub Director, Professor Jeremy Watson (STeAPP).

3. Response to Questions regarding London's Transport Infrastructure

3-1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

[Response 1]

London's success as an economic, political, cultural and social centre is well understood and London's history and current dominant position both nationally and globally would strongly suggest that it has enduring characteristics that allow the next thirty years to be considered with some confidence.

With this as a non-controversial backdrop, the future of London can be speculated upon by drawing on a UCL authored report that itself drew upon both a day-long workshop involving senior representatives from the UK built environment and supplemental authoritative sources (UCL, 2015). The report is available electronically here:

http://issuu.com/ucl_cpm/docs/changing_demographics_151127.

Throughout the report there is repeated reference to London's potent attractiveness. This means that both London and its environs will continue to attract individuals, organisations and investment. The report had limited scope and only focuses on three forms of the built environment comprising key elements of our social infrastructure: housing, healthcare and education. To the intelligent and well-informed reader there will be nothing of great surprise as many of London's challenges are well understood. However, three issues or topics are worthy of highlighting:

- 1) That the housing problem that the UK is experiencing is the result of the 'game' played in, and through, housing and the type of players in this game. The UK housing game is distinct – it sees housing as being a social necessity (we all need somewhere safe and secure to rest) and, ideally and in terms of aspiration, our (citizens') biggest financial investment. This housing game is played out within a strict planning rule-set, now with a far more onerous financial set of challenges in terms of obtaining a standard and traditional mortgage. The current and recent result of the game played and its rules is the social utility of housing is overshadowed by the financial return – so housing moves from a fundamental social provision to a financial asset and resulting investment strategy. This game attracts a specific type of player in terms of supply. Rather than housing being seen as social right, it has become dominated by those seeking either asset appreciation or derived income from this asset. And here, to compound the issue, the asset is not the house or dwelling, but the land rights that are entwined with the dwelling. With strict limits on land use, the result of increasing demand is that those in control of developable land choose how, where and when to release that land (with housing built on it) so as to maximise their returns. Those able to buy such housing can, and do, store or even stockpile the financial asset without ever seeking to generate any form of social utility from it. This then has serious disruption and displacement effects. With this game in play, the rules of the game set and understood, and the players we have – there is no indication that anything significant will change over the next 20-30 years. Three strategic options are proposed for consideration:
 - a. Change the game – decouple the provision of housing as a social utility from that of a prime financial asset. Here there needs to be a cultural shift to the acceptance of

long-term stable renting as is found in many parts of Europe. It is possible and for some young Londoners this is already a reality. In terms of meeting this possible demand, there is evidence from sub-sectors such as student accommodation that institutional investors are attracted to stable renters. The shift will have to be mainly in dissuading the younger generation that owning their own home is the mark of true Britishness.

- b. The rules can be changed, most notably around the protection of the Green Belt, but this would be highly divisive. The move to allow 'permitted development' to bring into active use redundant office space has had large unexpected consequences as active offices were converted – again this creating displacement and disruption.
 - c. New players can be attracted to 'the game' via changing fiscal and other regulatory rules. This could be through strengthening those Residential Social Landlords as represented by bodies such as the Peabody Trust. This 'third sector player' approach, being neither private sector returns driven, nor overtly public sector, could take a long-term stable view and, if given access to land and title over the property, would have a substantial capital asset base on which to borrow and invest.
- 2) That technological advances will allow or indeed encourage more and more kinds of activity to take place in our homes. London is primarily a location for work derived from knowledge and as ICT becomes more pervasive and powerful, so knowledge workers will have options as to where to communicate in person or digitally. The trajectories of retail is telling – it has made the move online and this trend is set to continue as more shopping is done online. Similarly social exchange is taking place on digital platforms, and over the next 20-30 years we can expect more 'telecentric' health and education services to appear and become routine. Online learning is already established. In health, the cheap and easily installed monitoring and sensing technologies will enable remote healthcare – of both preventative (wellbeing) and response (remedy).
- 3) As a result of both technological shift and the possibility of more fear as a result of more crowding and the rise of extremism, there is a realistic prospect of strata of London's population retreating to their homes. This then may see London occupied more by visitors and tourists than it is by those living and working in London. This occurred in small measure during the 2012 London Olympic Games, and this may shift established daily and seasonal patterns of movement.

[Response 2]

One great indicator of - and clear factor in - London's success as a global city of entrepreneurial and cultural excellence is its ability to attract young people to live and work in the city. Young people flock to London, bucking the trend in terms of net migration to London, with 20-29 year olds the only age group demonstrating a net positive inflow into London from other UK regions (ONS, 2013). Other age groups on balance leave London, to the South East in the large part, continuing to contribute to the economy but not adding the same dynamicity as younger groups. London is also sustained through immigration of foreign-born nationals, who, contrary to media reports, are highly skilled and contribute positively to productivity (LSE, 2007). The development of London must ensure its continued attractiveness to these groups.

A significant challenge towards maintaining these benefits is finding places for people to live in and around London. The trend of increasing house prices in central and inner London does not look like abating any time soon, for a wide range of reasons. Twinned with a limited capacity for building new housing in central areas, will mean outer London and commuter belt towns become the only viable option for many of those wishing to move to or buy in London. As Marchetti's Constant (Marchetti, 1994) (and subsequent research from Zahavi, 1973, and Metz, 2008) shows, people are happy to travel further and further to work, but they generally are not happy to spend much more than an hour per day on commuting. There are no reasons to suggest that London introduces relative benefits that would significantly buck this trend. This limits the physical extent of London's commuter belt. While some jobs will drift towards being more easily conducted from home, a sizeable proportion of jobs (particularly those conducted by younger people) will remain located in central London.

There is a risk that, as demand is displaced to commuter belt towns well linked to central London, the benefits of lower costs and greater space will be reduced. This reduces further opportunities for younger and immigrant groups to find suitable housing, risking these groups looking elsewhere to take their labour, energy and ideas. As such, a focus of transportation infrastructural improvements should be on improving access to central London from outer London locations.

Beyond potential impact on labour, the subsequent displacement of lower income groups from central areas risks the reduction in cultural diversity, a strength of London as a global city, and potentially meaning London becomes a less interesting place to live. These combined factors ultimately risk London becoming a less attractive place to live and work, losing competitiveness both nationally and globally.

[Response 3]

From a classic transportation economics perspective, demand for commuting is derived rather than innate. In the case of London, the concentration of well-paid jobs in central London vis-à-vis the lack of affordable housing inaugurates the demand for excess commuting to access job opportunities. Charging a council tax supplement will not only capture the land value lifted by publicly invested transport infrastructure in London, but will also discourage the non-commuting investors from holding housing stock only as an income-generating asset, hence resolving the fundamental jobs-housing imbalance problem in London.

3.2. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

[Response 1]

Investment in transportation infrastructure should focus on enhancing public transportation services. While London has formed and expanded on road, transport provision over longer distances and of increasing numbers of people cannot be achieved through road expansion. Bold political leadership is required to make it clear that this must be the priority for investment, to ensure London's sustainable growth and continued success.

There are three main areas of opportunity for expenditure in transport infrastructure. First, involves significantly enhancing existing routes into central London from outer London and commuter belt locations, increasing speeds, improving capacity and expanding where necessary. Second, new infrastructure should improve the connectivity to and between outer London town centres, helping to promote their role as drivers of employment and productivity, reducing dependence on central London. And third, there should be a better integration of services, achieved through both infrastructural and organisational changes.

London is well served by a comprehensive distribution of public transportation services. However, these routes often lack sufficient speed, frequency and reliability of service. A priority should be placed on expanding these existing public transport services to growth areas in outer London and the commuter belt. Increased provision to these regions will ensure improved housing options for those wishing to work in London, increasing access to central London, and ensure adequate labour provision for central London employers. Specific extensions to existing infrastructure that should be considered are:

- Improve speed and frequency of regional rail and Overground services in south east London, taking these services closer to Underground level services. Make better use of hubs for interconnection between services where infrastructure currently intersect (e.g. at Peckham Rye, Crystal Palace or Tulse Hill).
- Improve Overground services to north East London, improving the link with the Victoria Line at Walthamstow.
- Improve capacity and frequency of rail services along north London lines to Welwyn Garden City, Hatfield and Potters Bar.
- Make better use of HS1 services to St Pancras via Stratford with increase in high speed services from Gravesend, Chatham, Maidstone and Ashford.
- Improve speed and capacity of services to Essex (Basildon, Brentwood, Southend).
- Extension of Victoria line from Brixton to Croydon via Streatham and Norbury.
- Extension of Bakerloo line to South East from Elephant and Castle (already under consideration).
- Ensure improved speeds and frequency along the Hertford East line to Broxbourne, Hertford and Ware (some provision is stated in Crossrail 2 proposals).

As a secondary priority, the provision of new services between outer London locations should also be considered. Increasing land prices in central London will increase the importance of outer London town centres as drivers of employment. Given increasing demand through central London, direct connections between centres should be considered. Overground services are currently not quick enough to provide the required connectivity. Priority should be given to north-south links in east and west London (e.g. Stratford to Lewisham and/or Bromley; Wembley to Kingston). The currently piloted Mini Holland scheme to provide direct and safe cycle routes into major town centres from surrounding areas should be expanded.

The public transport network requires greater equity in terms of service speed and reliability, and this will be best achieved through centralisation transport planning and operations. Many of the rail services are woefully underserved, poorly managed and overpriced (Thameslink is one particular service). London's development should not be put in the hands of Train Operating Companies with little motivation to adapt quickly to changing conditions. Transport for London should be granted control over all services, allowing the development of an integrated and current

transport plan. An extension of planning and operations should be considered as far as rail services from some key commuter belt towns, again in order to better plan and coordinate future development.

[Response 2]

There are several opportunities to increase the benefits and reduce the costs of CrossRail 2. First, multiple-platforms should be considered in all the stations at the core section. In busy metros, the number of trains per peak hour is decided by the dwell time of each train at each station. The dwell time is the time used for passengers getting on/off a train (and for some at-station operations, including safety check before door closure). The current standard platform configuration for Crossrail 1 and other metro lines is shown in Figure 1. With this configuration, if a train stops at a station, then next train cannot enter the platform. Although London Underground's Victoria line runs 34 trains per hour, this is exceptional and is possible because each carriage has 4 doors on one side and the destination of trains are the same (and thus little variance in terms of the number of boarding passengers). Because Crossrail 2 will have several branches and the passenger distribution between trains will not be even (and the number of doors per carriage per side would be two or three), with the standard station configuration, it could run only up to around 24 trains only. UCL has run a series of experiments to investigate whether or not it is possible to accommodate 50 boarding/alighting passengers when the proposed Thameslink runs 30 trains per hour (proposed maximum capacity), and the result was "No" (UCL, 2008).

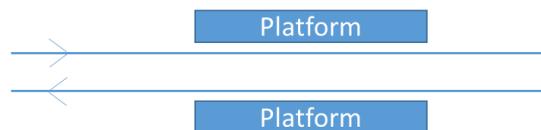


Figure 1. Standard track/platform configuration at stations

To solve the problem, an answer would be multiple platform (Figure 2). With this configuration, while a train is still dwelling at Platform 1, the next train in the same direction can enter Platform 2. This would allow more trains to run on the same line and it is possible to run around up to around 34 trains per hour even if the dwell time is significantly longer than that of Victoria Line. It can be seen that the additional infrastructure is just an additional track on the outer side of the platform in each direction and this little difference in fact significantly improves operational capability. In addition, even when a passenger ill is taken from a train (which is one of the major reasons of train delay of London Underground), if there are two platforms, one platform is available for the next train, which can run without being delayed by the train with the passenger ill. This improves the resilience of the operation. By adding switches between platforms 2 and 3, trains can reverse in case of emergency and this also improves operational resilience. Some people may think this is an engineering issue, but it is important to take account of this at an early planning stage because Crossrail 1 or Thameslink did not consider this, and it is envisaged that they 1 will suffer from long dwell time of trains in its core section, in particular St Pancras and Tottenham Court Road stations.

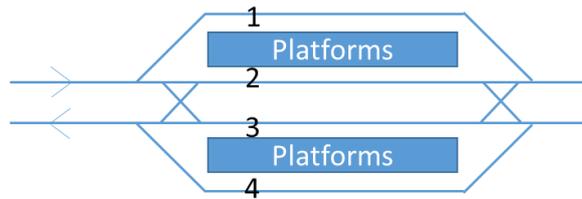


Figure 2. Suggested track/platform configuration at stations

Secondly, it is possible to consolidate depots around London. Currently, South Western Main Line has a depot at Clapham Junction and Wimbledon, and Great Anglia and West Anglia Line has one at Illford as a near-London rolling stock base. The reason of having a London depot is that London is a terminus of the line and operationally it is convenient to have a depot around a terminus. However, when Crossrail 2 opens and many trains run through London, there will be no strategic reason to have a depot in or near London where land prices are high. Depots can be consolidated and moved somewhere (and old depots in and around London can be sold).

[Response 3]

Crossrail 1 has been partly funded by business rate supplement. Yet, residential landlords are arguably the bigger beneficiaries of improved transport infrastructure in London. A similar council tax supplement will not only capture the residential land value lifted by Crossrail, but will also incentivize more efficient location choice by all of the Londoners.

3-3. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

[Response 1]

In the UK, although a good portion of the rail fare revenue will be reinvested to infrastructure improvement, customers do not feel that their money will be used for improvement of their lines. In Japan, there is a law which enables each private train company to add a (relatively small amount of) surcharge to the fare, which will be used solely for a specific capacity improvement project. This arrangement looks similar to the current funding arrangement for Network Rail and Train Operating Companies in the first sight, but the differences are that 1) in Japan each main commuter line is owned by a different company and thus customers think that the surcharge is used only for the improvement of their particular line, and that 2) the surcharge can be added even before the project completes on the basis that current users will benefit in the future. This approach can be used in the UK as well. For example, as preparation for Crossrail 2, it may be possible to add a specific surcharge to the lines whose trains will run into Crossrail 2. The surcharge can be distinguishable from what the TOC would like to charge as the fare to them. Because people can expect that the money will be used for the specific project which is (or will be) beneficial to them, it would be easy for them to accept the surcharge.

In addition, before Games 2012, there was an increase of council tax in London to generate funding for Games-related constructions. This was accepted by the public because the increase of

the tax was for a limited period and Games 2012 were generally welcomed. This approach can be used for major transport projects which bring a wider economic benefit to communities.

Lastly, when contracting out the work, Crossrail 2 should consider consolidation of the infrastructure building and railway operation (i.e. running trains). Past major transport projects in London have seen separation of infrastructure building and railway operation, which is common in transport infrastructure development in developing countries. London Underground's Public Private Partnership scheme, which included infrastructure upgrade and operation, did not go well, but this was mainly down to their lack of experience in specification or contracts. Now London has learnt lessons, and the proposed combined approach could save money because in modern projects, much money and effort have to be spent on integration between different systems. By consolidation, it is possible to transfer the costs and risks associated with integration, to the contractor.

[Response 2]

Apart from the aforementioned value capture taxation approach, China has been experimenting with privately funded metro station maintenance by local homeowners who expect their property/land value to rise as a result of improved transport facilities.

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The Benefits of Transport Investment: and why we can't build our way out of congestion

Submission to the National Infrastructure Commission by Dr David Metz, Honorary Professor, Centre for Transport Studies, University College London, formerly Chief Scientist, Department for Transport.

In this submission I offer evidence of the ways in which transport investment benefits individuals and society, in particular how this contributes to economic growth. I compare and contrast the rather different situations of London and the Northern cities.

Long term trends in travel behaviour

The Department for Transport (DfT) commissioned the first National Travel Survey fifty years ago and has repeated this regularly for forty years. Figure 1 shows the key parameters on a per capita basis covering all modes of travel (except international air). Average journey frequency has remained at about 1000 trips per person per year over the period. Average travel time has held steady at around 370 hours a year or an hour a day, a figure found globally for settled populations. What has changed is the average distance travelled, which increased from 4500 miles a year in the early 1970s to 7000 miles by the mid-1990s, since when there has been no further growth.

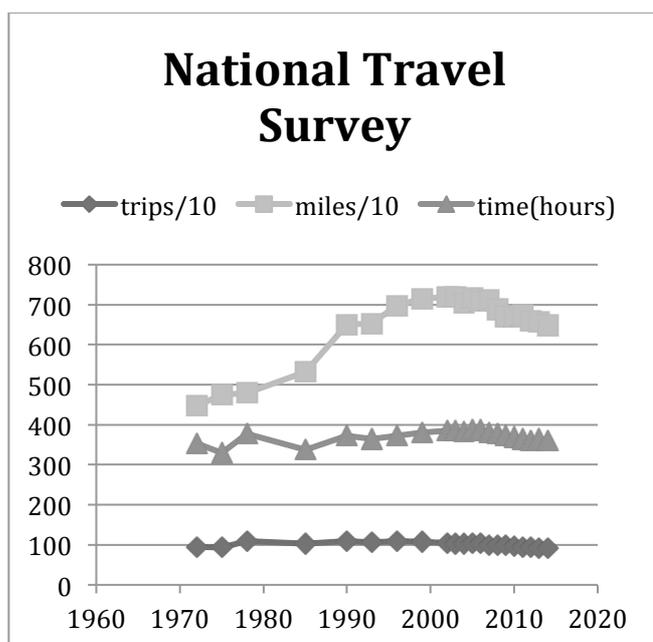


Figure 1 Source NTS(2015)

People have travelled further in the same amount of time because they have travelled faster, the consequence of investment in speedier forms of transport – private investment in cars, public investment in road and rail infrastructure and trains. It is important to recognise that people have taken advantage of higher speeds to reach more distant destinations, not to save time travelling to unchanged destinations. We travel further in order to have more access, opportunities and choices. For instance, by travelling faster on the journey to work, we have more choice of employment accessible from where we live in the time we allow ourselves for commuting, more choice of homes accessible from our workplace, and similarly more choice of shops, schools etc.

Figure 1 shows that there has been no growth in per capita travel for the past twenty years. Growing personal incomes are no longer an important factor in the growth of travel. Rather, population growth is now the main driver of overall demand growth.

Three-quarters of the average distance travelled in Britain is by car, hence we find that the average distance travelled by car has also ceased to grow, starting well before the recent recession. This cessation of growth of per capita car use is found for most of the developed economies for which data is available, a phenomenon known as ‘peak car’. A number of contributing factors have been identified, including less interest in cars by the urban young, changes in company car taxation (in the UK), saturation of demand for access to daily travel destinations, and technological constraints on faster travel (Metz, 2013).

Economic benefits of transport investment

The convention of transport economists, central to the DfT’s investment appraisal methodology, is that the main economic benefit of transport investment can be estimated as time saved through faster travel. Such time savings are valued because they permit more productive work or desired leisure. However, the evidence of the National Travel Survey is that there are no time savings in the long run, as seen in Figure 1, which is in effect an evaluation of the impact of cumulative investment over a forty year period. Time savings are therefore short run and mislead as regards the benefits of investment in long lived infrastructure.

People take advantage of higher speeds to travel farther, which results in changes in land use, development in particular. This is evident in the regeneration of East London, Docklands and beyond, the consequence of public investment in urban rail that has made brownfield land accessible for development by private sector developers who construct commercial and residential properties that accommodate jobs and homes for the city’s growing economy and population. The causal mechanism linking transport investment to economic benefit is via improved access and resulting development.

Notional time savings by those who, for instance, will travel from home to Canary Wharf using Crossrail when opened do not illuminate the case for this investment since these depend on both uncertain forecasts of passenger

numbers and problematic Stated Preference experiments intended to value individuals' trade-offs between time and money. Moreover, the 'wider impact' benefits that are conventionally added to the time savings are based on econometric estimation of agglomeration and related effects – further notional benefits, not directly observable.

Changes in land use and enhancement of land values are not included as benefits in conventional appraisal because this is seen as double counting benefits already included as time savings. However, this is a theory-based approach. An evidence-based approach would count what is real and observable, which would avoid double counting because people can do only one thing at a time – if they are taking the benefit of faster travel to gain more access, opportunities and choices, they cannot be saving time to carry out other activities, and vice-versa.

Investment appraisal of proposed transport investments should accordingly be based on evidence of expected benefits, as assessed from evaluations of outcomes of similar completed schemes. In general, changed land use and real estate development will constitute an important part of the benefits, which it would be misleading to disregard.

Road and rail investment

The case of investment to catalyse the development of Docklands is characteristic of new rail routes. Recall the USA in 1840, populated largely along the coasts and inland waterways, the economy about the size of that of Italy's. There followed a boom in railway construction that opened up the interior to agriculture, mining and industry such that by 1890 this was the largest economy on the world.

Rail investment can effect a step change in access. For roads, the effect is generally incremental. Consider England's Strategic Road Network (SRN) where much investment is planned to cope with forecast growth of traffic. Congestion largely occurs near to populated areas where local users take advantage of the network for daily travel, whereas remote from such areas the traffic generally flows freely. Thus about half the traffic on the M25 comprises long distance users, for instance between the south coast ports and the Midlands and the North, avoiding London, the purpose for which this orbital route was built. The other half is local traffic, in particular journeys to and from work giving rise to the familiar morning and evening peak congestion.

The conventional approach to investment appraisal sees a congested motorway as an opportunity for investment to increase capacity. Time savings per vehicle multiplied by the large number of vehicles, then multiplied by standard values of time savings, generate monetary values of economic benefits that are compared with the construction costs to allow judgment about value for money. However, the time savings per vehicle are quite small.

Evaluation by the Highways Agency of a large number of what it terms 'major schemes' indicates average time savings of 3 minutes at peak, less away from the

peak usage. There is debate about the significance of such small times savings. On the one hand, it is argued that these are too small to change behaviour and so should be disregarded. On the other, it is contended that small time savings add up and so in logic must be counted.

While 3 minutes saving on a long distance trip is immaterial in behavioural terms, such time saving is likely to be significant for a local user. The faster travel made possible by an extra lane or improved junction, for instance, allows more opportunities and choices, particularly when people come to change jobs or move house. More generally, in those parts of the country where demand for housing exceeds supply, it must be expected that local users will take advantage of additional capacity on the SRN to seek more distant housing opportunities that they can afford. A similar effect is seen with urban rail improvements such as London's Overground. Some of the largest percentage increases in house prices in London in recent years have been found near stations on this route south of Docklands, in locations like New Cross, of limited inherent attraction but with relatively low priced housing.

When analysing the case for road investment, it is important to consider the different kinds of user and how each may benefit (as is done for rail investment, where commuters are distinguished from long distance travellers). Available evidence is consistent with the proposition that the main benefits of investment in the SRN accrue to local users who are enabled to travel further on their daily trips. The extra traffic thereby generated is known as 'induced traffic', which is the consequence of road construction and arises because in the long run people take the benefit of faster travel by travelling further, not by saving time. This extra traffic restores congestion to what it was before the investment and is the basis for the maxim 'You can't build your way out of congestion', which we know from experience to be generally true.

The increased access made available to local users leads to changes in land use - property development where planning consent is granted, increased prices of existing property where not. Such development is largely unintended. There is, however, a case for intentional road construction to foster development, but this has to be led by the developers and planners. If they agree that a site is suitable and commercially attractive for development, whether residential or commercial, and if investment in road access is needed to permit the development, that could be an appropriate claim on a roads budget, whether local or national, subject to a value for money test.

An example is the plan for a new 'garden city' on a former military site near Bicester, where 13,000 new homes are to be built and where the DfT has allocated £44m for road construction, including a link to the M40. This illustrates both that new housing on greenfield sites will require road investment on account of car ownership by residents, and that decisions about the location of such investment must be based on the intentions of the planners and developers, bottom up, not as part of a top down national strategy.

Tackling congestion

The rationale for much roads investment is to relieve congestion. One stated aim of the Government's Road Investment Strategy is a 'free-flow core network, with mile a minute speeds increasingly typical'. But if we can't build our way out of congestion through investment in civil engineering technologies, how is this aim to be achieved?

One possibility would be to toll new road capacity, partly to finance the construction and partly to deter local users who impede long distance traffic. The M6 Toll road operates successfully in this way.

A second approach addresses the reason why congestion is a problem. Surveys of road users indicate that an important factor is lack of reliability - the uncertainty of journey time. This can be tackled by providing users with good predictive trip time information. An example is the motorway roadside variable message sign predicting the time to the next junction – albeit short range and hence of limited utility. A more ambitious service is provided for freeway users in the Seattle area of the US who can input to the Department of Transportation website the locations of their home and work, the time they wish to arrive at work, and are advised the time to leave home to be at work on time 19 times out of 20. A further example is Google Now, which includes predictive travel times on the road system.

As well as providing useful information to individuals that lessen unreliability associated with congestion, there are benefits to the network as a whole. There are two kinds of road user: those who need to be at their destination at a particular time (for instance, going to work, to a meeting, making time-critical deliveries), who can use predictive journey time information to decide when to set out; and those who are more flexible in trip timing (going shopping, making am/pm deliveries), who can use such information to avoid peak traffic. This is win-win since the more the flexible users can avoid peak times, the less the congestion experienced by those who cannot avoid them.

The scope for mitigating the uncertainty associated with congestion is indicated by the ability of efficient road freight hauliers to offer clients just-in-time delivery. A haulier may contract with a supermarket chain to deliver from the central warehouse to the stores within 30-minute time slots, which the haulier can achieve because of the good understanding of the network and the ability to manage the location and performance each vehicle in the fleet using real-time and predictive traffic data from commercial sources.

Transport and economic performance

This road freight example is one instance of the way in which investment, in digital technology in this case, can contribute to improving business performance. It should be seen in the broader context of retail distribution taking advantage of faster travel on the road network to optimise efficiency by

consolidating many regional depots into a few large central facilities, thereby saving estate and inventory costs while improving distribution to high street outlets, so enhancing competitiveness.

It is, however, difficult to generalise about how transport investment may be expected to improve economic performance where the road and rail networks are mature, so that investment is at the margin, rather than transformative. The What Works Centre for Local Economic Growth at the London School of Economics has reviewed 29 impact evaluations that met minimum standards of evidence (WWC, 2015). Key findings, mostly based on a small number of studies, include:

- Road projects can positively impact local employment. But effects are not always positive and a majority of evaluations show no (or mixed) effects on employment
- Road projects may increase firm entry (either through new firms starting up, or existing firms relocating). However, this does not necessarily increase the overall number of businesses (since new arrivals may displace existing firms).
- Both road and rail projects tend to have a positive effect on property prices, although effects depend on distance to the project (and the effects can also vary over time)

The general lessons from this review of transport investments are:

- The economic benefits of transport infrastructure spending – particularly as a mechanism for generating local economic growth – are not as clear-cut as they might seem on face value.
- Arguments for spending more in areas that are less economically successful hinge on the hope that new transport is a cost-effective way to stimulate new economic activity. We do not yet have clear and definitive evidence to support that claim.
- Our findings raise fundamental questions about scheme appraisal and prioritisation, and about the role of impact evaluation in improving decision-making around transport investment.

Transport investment in London

The population of London is growing quite rapidly, but the city long ago decided not to accommodate additional car use, so the share of journeys by car has fallen from a peak of 50% of all trips in 1990 to 37% currently, with further decline to about 27% expected by 2050 on the basis of forecast population growth (central case) and continuing policies to invest in rail but not increase road capacity. Figure 2 shows an estimate of the share of journeys by car in London over the century 1950-2050. This exemplifies the concept 'Peak Car in the Big City'.

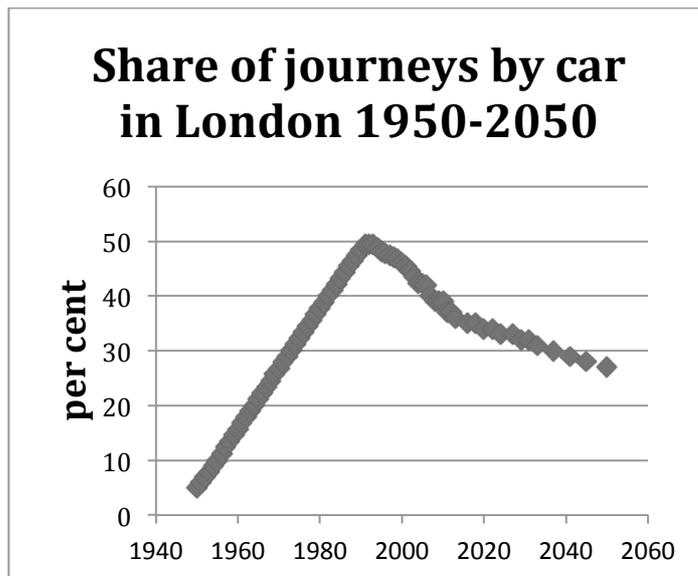


Figure 2 Source Metz (2015)

London is thriving - economically, culturally and socially – both despite and because of the decline in car use. Two key policies are largely responsible: a road capacity constraint plus parking controls in the inner boroughs and congestion charging in the centre; and major investment in rail that provides speedy and reliable travel for work trips, compared with the car on congested roads. As we see at Canary Wharf, well paid professionals can be attracted out of their cars onto trains through the stick of limited parking and the carrot of frequent fast rail services. In contrast, cities that rely on buses for public transport find it much more difficult to get commuters out of their cars.

The Mayor of London is responsible for both the transport system and for spatial planning, a helpful combination which contributes to the success of the city. The London Infrastructure Plan 2050 outlined options for investment in transport and other infrastructure to respond to population growth from 8.6m currently to 11.3m central estimate by mid-century and the corresponding growth in employment. This spatial plan provides a suitable strategic context for specific schemes such as Crossrail 2.

The economic case for each individual scheme will need to be made. This case needs to be grounded on evidence-based expectations of the benefits, in particular development of real estate (land and property) that will accommodate jobs and homes. Benefits from travel time savings should be counted only when these can be observed. Notional benefits from ‘wider impacts’ would be subsumed within market values of property and rents.

Given that the long term benefits from transport investment are found as real estate development, Transport for London should work closely with developers and planners to secure the benefits from its investment. In favourable cases, the enhancement of land values may be sufficient allow the developers to contribute to the cost of the transport investment.

Transport investment in Northern cities

The example of London argues for a spatial plan to provide the context and rationale for transport investment in the Northern cities to accommodate population and economic growth. One possible outcome, perhaps tacitly, would recognise Manchester as the main centre of the region, with an emphasis on the development of that city as a centre for business services. Another, perhaps politically more feasible, would be a multi-centric region of medium sized cities, somewhat analogous to the Thames Valley, with a mix of manufacturing and services. One key question is how to take advantage of the research potential of the universities, both for the cities in which they are located, and across the region. Related to this is the question of where to locate business in relation to the availability of skilled staff (it is noteworthy that Amazon has recently moved its UK HQ from Slough to central London).

At present there is no mechanism for spatial planning across the Northern cities as a group, and hence no consideration of options for location of population and economic growth across the region. Absent a spatial plan, decisions on transport investments will be an important influence on spatial development in ways that need to be addressed as part of the investment case.

It is not straightforward to develop a persuasive case for specific investments in the context of the Northern cities. Estimates of benefits based on travel time savings give no indication of the spatial location or likely scale of development. Estimates of 'wider impacts' depend on either rules of thumb or ambitious modelling which cannot be validated. It is therefore hard to say how transport investments will benefit the economies of these cities, based on conventional appraisal methods.

It is easier to predict changes in land use arising from transport investments that change travel to work patterns. Faster travel may be expected to result in people seeking housing and employment opportunities further afield. This would both improve the efficiency of labour markets and create opportunities for housing developments. For rail investments in particular, the location of new housing should be planned as part of the investment case.

Urban rail investments can allow cities to grow to higher density while meeting the mobility needs of the population. Regional rail plays a similar role. The tram-train being piloted at Sheffield-Rotherham is a relevant innovation. Bus rapid transit likewise provides speedy, reliable travel but at a cost lower than light rail (trams). Higher urban population densities generate agglomeration benefits, not only economic but also cultural and social, which enhance the attractiveness of cities, provided other aspects of urban liveability receive adequate attention. Accordingly, both urban and regional rail investments justify positive consideration.

What is unclear, however, is the extent to which better regional rail links that improve connectivity *between* cities would generate economic benefits over and above those associated with housing and labour markets for individual cities.

Road investments are even more problematic. For instance, the scheme to enlarge the M62 to four lanes along its entire length is intended to support the Northern economy but would induce local commuter use that would limit the benefits to long distance users. A new road link, largely in a tunnel, between Manchester and Sheffield might be of less benefit to commuters but would be expensive and hard to justify for improved connections between two cities that are otherwise well connected. More generally, road investments intended to improve connectivity within the region, whether north-south or east-west, are likely to be nullified by the stimulation of local use. Altogether, the ambitious plans for road construction set out in the Northern Transport Strategy seem of very uncertain benefit, albeit more consistent with a multi-centric region in which manufacturing remains important.

On the other hand, the plans for integrated information and ticketing across all public transport modes, part of this Strategy, are clearly sensible and, as digital applications, may be expected to be far more cost-effective than investment in civil engineering technologies. More generally, opportunities should be sought for other digital technology investments to improve the operations of the transport system and to enhance the experience of users. Predictive journey time information on the road network is one important possibility.

Modelling and forecasting

The standard approach to justifying transport investment of any scale involves modelling that compares a 'do something' case (ie with the investment) with a 'do minimum' case (without the investment). Most models estimate travel behaviour changes in the absence of land use change, generating travel time savings resulting from the investment that are used as inputs to the economic appraisal. However, for reasons previously discussed, assuming no changed land use is not consistent with evidence from completed schemes. Models that integrate transport and land use are available, although not generally employed.

Modelling involves much uncertainty, many simplifying assumptions and limited data for calibration. Transport models cannot be independently validated. Given the considerable judgement involved in generating plausible outputs, it is not surprising that modelling is generally found to support the inclinations of the authorities that commission the studies. When such authorities are bidding for central government funds, other people's money, modelling will generally be found to support the bid.

A further difficulty with transport models is the routine assumption that the future will be like the past, with change driven only by exogenous parameters such as GDP growth, population growth, oil prices etc. But if the future is different from the past, as is indicated by the peak of car use in London (shown in Figure 2) and similar indications for Birmingham and Manchester (Metz, 2013), then forward looking relationships (elasticities) need to replace historic calibration data. This is difficult to achieve in practice. For example, the DfT's

National Transport Model has not yet recognised the emergence of peak car use in London and so forecasts substantial increases in car traffic in this city.

Conclusions

The transport system moves people and goods through space. New investment adds to this movement, the benefits being reflected substantially in changed spatial distribution, not reductions in travel time. The difficulties that the Commission is likely to experience in making recommendations for transport investment derive in part from shortcomings in existing methodologies, in particular that conventional economic appraisal is based on estimates of notional times savings and disregards the evidence for changed land use and real estate development as important benefits of investment. Moreover, conventional travel demand modelling and forecasting does not recognise important recent changes in behaviour, as reflected in the peak car phenomenon.

For its medium term work, the Commission might wish to review these methodological issues. More generally, there may be a role for the Commission to act in ways analogous to the Office for Budget Responsibility and the Committee on Climate Change, offering advice to national and local government on the merits of infrastructure investment based on independent analysis, both of methodologies and of substance.

In London, expected economic and population growth is the main determinant of future transport investment, which is therefore relatively unproblematic in principle. For the Northern cities, such growth is less obviously a given, and a desired role for transport investment is to foster growth. However, the prospects for speculative transport investments are uncertain. Hence to secure the benefits of transport investments, decisions should not be taken in isolation but as part of planned real estate developments involving both developers and planning authorities. Decisions on urban and regional rail investments seem more straightforward than for road investments, for which there is a good case for preferring cost-effective digital to costly civil engineering technologies.

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4 January 2016

LONDON'S TRANSPORT INFRASTRUCTURE: Minding the Gaps

This evidence is submitted by Dr Nicholas Falk, founder director of URBED and an economist and strategic planner. Nicholas is a member of the Town and Country Planning Association's Policy Council and working group on London and the South East, and is the author of many publications on cities, including policy reports for the Greater London Authority on suburbs, some of which are referenced here, and which can be accessed freely on www.urbed.coop. He won the 2014 Wolfson Economics Essay Prize (with David Rudlin) for Uxchester Garden City, which shows how to build strategic housing that would be visionary, popular and viable.

The National Infrastructure Commission has a key role to play in ensuring a limited investment budget is spent where it will produce the best returns for the country. As London strives to compete with other world cities for investment, transport capacity will continue to be a top priority. However, having enjoyed a greater share of national investment since the Jubilee Line was extended out to Canary Wharf and High Speed One was opened up, and with the benefits of Crossrail One still to come, it will be very hard to make the case for more major projects on transport grounds alone.

Hence it vital to avoid 'vanity projects' and to consider not only 'agglomeration economies' but also the environmental and social benefits that would come from better planned growth at the edges. This brief paper suggests how 'smarter growth' could be secured, drawing lessons from Paris, Rotterdam and Copenhagen so that transport investment mobilises private investment in sustainable forms of development, especially new housing. It argues that the NIC should apply Multi-Criteria Analysis (MCA) to assess the impact of options on property investment and affordable housing.¹ In a sentence, and in the words of the familiar cry on London's Underground, the NIC should '*Mind the gaps.*'

1. Economic and social challenges

While London has reversed the economic decline of the 60s and 70s its economic position is precarious for three main reasons. First it is an exceptionally expensive city to live in, with high housing and travel costs.

¹ Recommendations on the use of MCA are set out in the final report of UCL's Omega 3 project 2010-
<http://www.omegacentre.bartlett.ucl.ac.uk/wp-content/uploads/2014/10/OMEGA-3-Final-Report.pdf> and in the RAMP handbook (Risk Analysis and Management for Projects, ICE 2014

Second the difficulties of finding somewhere to live and work could provoke more of the riots that damaged centres like Ealing and Clapham Junction a couple of years ago, and that have hit Paris. Third with English being spoken throughout Europe, the jobs in economic success stories like media and education could easily relocate to cities such as Paris, Rotterdam or Berlin, where not only are premises much cheaper, but it also easier and often more pleasant to get around. The problems are most acute in Outer London, as revealed in government wellbeing surveys, as well as in research URBED undertook for the Greater London Authority.²

In making national infrastructure investment decisions there are many choices and factors to be considered. For example The Guardian, in its lead editorial of December 8th at the height of the flooding stated:

‘Surely this is the time for the builders to build the infrastructure that people want and need. It’s time for government to put its money where its mouth is.. Flood defences are much greater priorities for those affected by these recurrent floods that HS2 or a third runway at Heathrow. Every pound spent on keeping communities dry and protected saves £10 in damage’.

Simon Jenkins’ s headline *London must stop sucking cash from the rest of Britain* says it all.³ The priorities for transport investment in London MUST therefore be linked to wider objectives such as opening up more affordable housing while retaining the stock of business premises around major stations such as Waterloo, London Bridge and Euston, and not just enabling long distance travellers to go further faster.

Annual study tours URBED ran for the TEN Group of London planners to European cities have brought out the potential for comprehensive planned mixed use developments with transport at their heart.⁴ Comparative data reveal that mid-sized European cities enjoy much shorter (and cheaper) commuting times to work, thanks to their metro rail systems.⁵ They also provide much better and safer conditions for cyclists and pedestrians, as the example of Copenhagen vividly illustrates. As a result these cities have benefitted from ‘smarter growth’ in which transport investment and development go hand in

² See for example A City of Villages: promoting a sustainable future for London’s suburbs, SDS Technical Report 11, Greater London Authority August 2002

³ Simon Jenkins Guardian Opinion, December 24th 2015

⁴ See for example Learning from Berlin, www.urbed.coop 2008 or Living Suburbs: London vs Paris, 2013 www.urbed.coop

⁵ Ed. Nicola Schuller et al, Urban Reports, gte Verlag, Zurich

hand, and reinforce each other, a point Professor Sir Peter Hall has highlighted.⁶ While taxes are a little higher, this is because citizens invest in their ‘common wealth’, rather than borrowing to fund consumption, which helps keep their national economies in balance.

2. Strategic options

Given the state of public finance, the big projects for the next couple of decades in London are likely to be the sort of project recommended in the Eddington report that tackle ‘*growing and congested urban areas*’.⁷ A general principle should be to protect and expand places that already have physical infrastructure and social and environmental capital, rather than making it easier for people to travel from ever further away into Central London.

Rather than more ‘grand projects’ we need many more small projects that are linked to great ideas. This is exemplified by the way an extension of the Northern Line south of the river is opening up privately funded development at the old Nine Elms market and Battersea power station, and by the impetus that Crossrail is giving to developments in run-down areas such as Woolwich. However such sites close to the centre of London, such as Kings Cross Goods Yard, are now very rare.

It is also going to be increasingly important to avoid ‘planning blight’, and focus investment where it will produce the best return. Living close to Euston and Kings Cross, it is clear that the much-trumpeted ‘regeneration benefits’ of starting High Speed 2 or bringing Crossrail 2 to Euston are largely illusory, as there is so little undeveloped space. Apart from the redevelopment of the offices at the front of the station, the benefits could only be achieved by demolishing perfectly good social housing in Somers Town and somehow relocating the tenants to some other part of London. The result would probably be another riot, and will be strongly resisted.

So instead it would be far better to look for places where there is under-used space for development, and where connectivity could be improved. As examples these include the inner stretches of the Great Western Railway and Paddington Arm of the Grand Union Canal, or the edges of growing towns on

⁶ Peter Hall with Nicholas Falk, *Good Cities Better Lives: how Europe discovered the lost art of urbanism*, Routledge 2014

⁷ The Eddington Transport Study: the case for action, HM Treasury 2006

the edge of London, such as at Chelmsford, Watford, Slough and Redhill that already serve as junctions, or at Brentford, where there is a freight only line running to Southall, and where quality development is at last underway.

If ‘grand projects’ are needed, a really great opportunity is the potential for redeveloping Northolt Airport as a new garden city taking advantage of the three underground stations that serve it, rather than reserving it for relatively few Royal flights. Similarly there are good arguments for pressing on with extending Old Oak Common to create a commercial centre on a scale that matches an area like La Defence or Stratford, as well as a major transport interchange between Crossrail and other railway lines.

3. Getting more value from Crossrail

If we applied sound economic principles such as the minimisation of waste and environmental impact, and the promotion of social justice to locations that could benefit from new transport infrastructure, what would we do differently? The first place to invest is where capacity constraints are being relieved, for example by connecting up Crossrail One with the Great Western so that people can interchange readily without coming to a London terminal. The same principle could be applied to High Speed Two, thus saving a large part of the investment budget and a construction programme that could block the vital Euston Road East West link for as much as seven years.

Indeed wherever property demand is high and space is under-occupied, there are strong economic arguments for ‘smarter growth’ to get much more value from any public investment. Transport turns out to be a necessary but not a sufficient condition for growth, as the long delays in developing Ebbsfleet or the Greenwich Peninsula demonstrate. Of course talk of new transport encourages speculative investment in buying land, but it does not build anything substantial that will stand the test of time.

So to get more benefits it is essential to follow European practice in dealing with land that is identified for growth so that the subsequent uplift in land values can be ploughed back into the project, as in Germany, for example.⁸ This depends on taking a more European or proactive approach to spatial planning, which in short might be called ‘Minding the gaps’. In other words we should be focussing on using transport to open up sites that are ‘ripe for development’,

⁸ Barry Munday and Nicholas Falk, *The ABC of Housing Growth and Infrastructure*, The Housing Forum, 2014

and to reduce congestion and overcrowding on local links. This can include copying the German approach of SBahn or fast local trains, which is now being promoted under the name Swift Rail.⁹

Because there are lots of branches on Great Western (due to Brunel's ambition of getting to Bristol as swiftly as possible), there is great potential for attracting people away from their cars for journeys to work in the parts of Outer London that are particularly prone to congestion. This should be combined with the greater use of bikes as in Copenhagen or Dutch cities, which would enable people to get to work in less time and with much less stress. Of course it means providing more bike parking (as in Cambridge Station, for example), as well as safe bikeways alongside direct roads.

4. Funding transport infrastructure

As well learning from Europe on how to secure 'integrated' transport where different modes support each other and offer the preferred alternative for many people to the private car, we can also relearn from European cities how to pay for improvement by linking transport with development. Once the benefits are tapped, as they were when the Metropolitan Line was built from Baker Street out to North West London, or as has partly happened with the development of the Railway Lands at Kings Cross, we no longer have to rely on an over-subscribed transport budget, which can be directed instead at regeneration areas where demand is weaker. While land value uplift will only fund a proportion of the cost, it can 'lever' up public investment, as for example happened in extending the Jubilee Line out to Canary Wharf.

The NIC could therefore innovate in how funding is raised for local infrastructure. Whereas the use of bonds to finance infrastructure is quite common in US cities such as New York and Portland Oregon, it has proved difficult to persuade the Treasury to give local authorities the freedom needed. As a result we end up with a perpetual 'stop go' situation, which increases costs and drains capacity. The latest escalation of costs on the Great Western electrification seem to show the failures of our procurement methods to deliver the forecast outcomes.¹⁰

But the faults essentially stem from the way projects are designed, promoted and selected with little real evaluation of the options, as Ian Wray stresses in his

⁹ Nicholas Falk and Reg Harman, *Swift Rail and Growing Cities, Tramways and Urban Transit*, January 2016

¹⁰ See feature in *Modern Railways*, December 2015

new book *Great British Plans*.¹¹ Examination of recent examples such as High Speed One reveal the British often place excessive value on environmental features such as the Green Belt without regard to the financial implications or the cost of longer journeys to work. The Omega 3 report referred to earlier provides plenty of further evidence on how to improve the design and delivery of major infrastructure projects.

With public funding for investment being in such short supply, consideration will have to be given to tapping private sources, and to using the uplift in land values as a means of reducing borrowing costs. While this falls outside the NIC's remit, there is a host of evidence that makes the case for a charge on land.¹² Recent examples such as Dublin's LUAS tram system or Nottingham Tramlink, to show how support from employers and property interests can be secured.

5 Lessons from foreign metropolitan areas

As far as London specifically is concerned, much can be learned from major Transit Oriented Development schemes, such as 'Paris Rive Gauche' over the railway lines into Gare de l'Austerlitz, or Rotterdam's Kop von Zuid which is linked to the new Rotterdam Station by the Erasmus Bridge. Another good model is Copenhagen's new satellite town of Orebro, which has largely funded the first line of their new Metro by tapping the uplift in land values.¹³ The National Infrastructure Commission could hugely increase the value for money from infrastructure projects if it not only assessed the full range of options in terms of their wider impacts, but encouraged new funding and organisational models drawing on European best practice.

While direct comparisons are limited, the general conclusion is that

*For the UK, the main focus remains on the directly attributable economic performance of the transport service itself. In most continental European countries, the wider aspects of economic and strategic impact play an important part in considering the return on public funding; the political and technical processes of establishing this are key to decisions.*¹⁴

¹¹ Ian Wray, *Great British Plans*, Routledge 2015

¹² See for example TCPA publications like *Connecting England*, or *The Lie of the Land* in Hugh Ellis and Kate Henderson, *Rebuilding Britain*, Policy Press 2015

¹³ Each of these form case studies in reports of URBED's TEN Group study tours

¹⁴ Reg Harman, *High Speed Trains and the Development and Regeneration of Cities*, Greengauge 21, 2006

So what needs to be done? Sir David Higgins has set out five guiding principles for HS2, which provide a good start:

- Stand the test of time
- Be the right strategic answer
- Be integrated with existing and future transport services
- Maximise the value added to local and national economies, and
- Be a catalyst for change both nationally and locally.

But infrastructure (and HS2) is about far more than just transport, and so projects need to be evaluated against a multiple set of criteria. For example, the connection of Lille to the Channel Tunnel Rail Link to Paris provided the impetus for reversing the decline of a whole region. The case study in *Good Cities Better Lives* shows how local political leadership joined up transport and development.¹⁵ It contrasts with the sorry tale of North Kent, which is a case study in Ian Wray's *Great British Plans*.

Similarly development over the railway lines running into Gare de l'Austerlitz has transformed and reconnected a poor part of Paris with both sides of the River Seine. If such an approach were applied to Euston, it could overcome some of the objections, as at least it would provide additional land for regeneration. The summary of the French and German case studies in *Good Cities Better Lives* concluded that their greater success could be attributed to:

- 1 Municipal leadership
5. Strategic planning
6. Public-private relationships
7. Multi-Criteria Analysis
8. Local taxes on employers
9. Cost control
- 10.Domestic industry
- 11.Urbanism
- 12.City-regional cooperation.

The French approach is not perfect, and they have had much more civil disorder than London has yet experienced. Nevertheless, it does provide a relatively simple model for strategic planning that London could well learn from before it

¹⁵ Chapter 9 in Peter Hall with Nicholas Falk, *Good Cities Better Lives*, Routledge 2014

designs and delivers the next ‘grand project’.¹⁶ Significantly most European cities have adopted similar approaches to managing their own futures rather than depending on passing the begging bowl to government for every project. The National Infrastructure Commission could therefore fill an important gap by commissioning some comparisons in advance of further work on designing projects that may never be built.

6. Filling the gaps

Changing a flawed planning system will not be easy. In the introductory chapter to *Great British Plans* Ian Wray points out the 60% of the country’s infrastructure is now in private hands, the highest proportion in the world. This makes it very hard to secure the level and quality of infrastructure we need. Turning to the Chinese for help will still leave Britain with a long-term financial obligation. Plans often fail to deliver the promised outcomes because values have changed. So predicting what people will value in 30 years’ time is thought impossible, even though most innovations take this time to mature and spread. Yet as the Omega research at UCL has brought out, projects change, often for the better, as a result of debate about options. The techniques exist for making much better transport choices¹⁷. But the benefits can never be realised if projects are conceived and executed in silos, and then implemented for lack of better options. So the centralised nature of both the private and public sectors must be corrected if we are to do more with less, to plan for posterity rather than austerity.

So who would benefit from taking a longer-term and more holistic viewpoint, for example focussing on Britain in 2050, not just up till the next parliamentary election? The immediate answer is our children, and their children as well. So too would the poorer countries whose populations and economies are growing fastest. Less obvious are medium sized cities, such as Oxford, where there is a chance of securing more balanced growth and avoiding the diseconomies of over-crowding and pollution if funds were invested in good local transport systems.¹⁸ Also anyone who owned land on the edge of fast growing cities, especially those that benefitted from improved infrastructure and favourable planning decisions, would receive an unexpected gift from the State, and

¹⁶ Nicholas Falk, *Urban Policy and New Economic Powerhouses*, Town and Country Planning, August 2015

¹⁷ See for example, *Trams for Oxford: could light rail improve our historic cities*, report of a UCL/URBED seminar, March 2015 www.urbed.coop

¹⁸ Reg Harman and Nicholas Falk, *Developing Historic Cities: the case for an Oxford Metro, Tramways and Urban Transit* May 2015

therefore should be willing to accept paying a charge. We might even start rebuilding our lost capacity to engineer and supply transport products.

In short the key to making better infrastructure decisions, as the new National Infrastructure Commission may want to consider, would be to switch from valuing narrow costs and benefits to considering the longer-term impact on capital of all kinds – economic and social as well as physical and natural when it comes to both designing and assessing major infrastructure projects. While this may sound impossibly complex, given the failures of efforts to agree where, for example, London’s hub airport should develop, it could be applied to the next big issues on the public agenda such as Crossrail Two, High Speed Three or boosting energy capacity, all of which are on the National Infrastructure Commission’s agenda.

7. Conclusions

By using a form of Multi-Criteria Analysis, and analysing property values and trends, it would be possible to assess and value the impact of major infrastructure projects. The NIC could draw on examples from elsewhere to show the wider benefits. For example West London can draw lessons from the area around Charles de Gaulle airport or Schipol in Amsterdam. The Northern cities can usefully learn from the experience in the Dutch Randstad or the North Rhine area of upgrading local public transport. By setting the level of investment needed to match international competitors, and then allocating it where it will do most to close the gaps in living standards, we could reduce inequalities, and at least achieve the goal of social justice.

When the projects then raise productivity, as they should, and help minimise waste, for example by cutting the time taken to get to work or saving the need to build expensive bypasses, we will also score on the economic goals of minimising waste. Of course political judgements will still need to be made, but at least they can take some account of longer-term consequences rather than short-term electoral arithmetic. Going from ‘stop go’ to planned investment cycles is crucial to rebuilding Britain’s productive capacity, and avoiding the kinds of scandals that arise from costs overrunning due to lack of qualified engineers.

Finally, by changing behaviour so we use less energy and natural resources while improving wellbeing, for example through a great increase in cycling and walking or encouraging building new homes in the right locations, the NIC

would provide a model for sustainable development. That alone should be sufficient to overcome the opposition to acquiring land on the edge of growing cities at close to existing use values, and ploughing the uplift in land values back into improved local infrastructure. Of course there is nothing new in this. It is what Ebenezer Howard proposed for Garden Cities and the post-war New Towns started to do. All it needs is for our 'political leaders' to focus infrastructure investment on making the lives of future generations better, a cause that people from all sides should support.

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[email redacted]

December 2015

Rt Hon Sir Alan Haselhurst MP
Chair of the West Anglia Taskforce

National Infrastructure Commission
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By email to: londonevidence@infrastructure-commission.gsi.gov.uk

8 January 2016

RE: NATIONAL INFRASTRUCTURE COMMISSION CALL FOR EVIDENCE

Dear Andrew,

I write on behalf of the West Anglia Taskforce in response to the National Infrastructure Commission's invitation for evidence. The Taskforce is currently in the middle of an exercise compiling the evidence base for investing in the West Anglia Main Line (WAML) and will report its initial findings to the Government in the summer of this year. Members of the Taskforce include MPs, Council leaders and cabinet members, senior officers from the Department for Transport, Network Rail, and Transport for London and representatives of key businesses and business groups from along the route.

Investment in the WAML is necessary because the London Stansted Cambridge Corridor it serves has a unique value to the UK economy, and is growing fast:

- The corridor is one of the most successful economic regions in the UK, linking the university city of Cambridge with London, passing through identified growth areas such as the Upper Lee Valley (London's largest Opportunity Area) and the Harlow Enterprise Zone. The Centre for Economics and Business Research has projected that Cambridge will be the fastest growing city in the UK in 2016, growing at 2.9 per cent; London is expected to grow at 2.7 per cent.
- The corridor is a crucial arm of the London, Cambridge and Oxford 'golden triangle' which is driving technology and bioscience-led economic growth in the UK, and is home to major international operations from Microsoft Research, ARM Holdings, AstraZeneca, GSK, Pfizer and Illumina. Life Sciences and medical technology is the third largest contributor to economic growth in the UK and, according to research by the London Stansted Cambridge Consortium in 2015, is set to generate over 14,000 new jobs by 2023.

- The rail line is the primary gateway for domestic and international passengers using Stansted Airport, one of Europe's fastest-growing major airports, with onward connections to over 160 destinations in Europe, North Africa and North America. As pressure on airport capacity continues to grow in the south east, Stansted occupies a

unique position in the region as the only airport with spare runway capacity and room to grow in the future.

- London and Cambridge are ranked first and fourth respectively in the 2014/15 FDI (Foreign Direct Investment) "Top European Cities of the Future", based on their favourability for inward investment. Cambridge already has over 320 foreign-owned enterprises, supporting nearly 20,000 jobs and contributing almost £5bn in turnover. Not investing here could mean that business goes abroad and the UK loses out.

However, transport and housing constraints in the corridor are already beginning to limit this growth:

- The number of jobs in the area has increased at more than double the national rate in the last ten years. This creates a clear concern about how increasing numbers of commuters to the growing businesses along the corridor will access their places of work.

- A shortage of skilled labour will hold back companies from investing in the corridor, and there is already evidence that the labour market is tight. There are now historically low unemployment rates in some areas; for example, the unemployment in the district of Uttlesford is only 0.7 per cent (and this will continue as Stansted Airport and other businesses locally expand). An employer survey by the South East LEP found that there are many vacancies across the area in technical roles requiring higher-level education and that 23.7% of vacancies were due to skills shortages. This is despite the fact that in many areas of the corridor, the percentage of the workforce holding degrees is significantly higher than the national average.

- The building of new homes in the area is not keeping pace with population growth forecasts. In the last five years, only 9,400 new homes have been delivered in the corridor per year, with ONS forecasts suggesting that 16,800 each year are needed.
- The WAML currently consists of just two tracks along its entire length. With fast and slow services competing for space, this results in longer journey times, a limit to the number of services that can run and a high risk of service disruption due to a lack of alternative routes if one track is out of action. This creates an uneasy contrast between the area's first class businesses and the second class railway on which their workers and visitors need to travel to access them. Journey times on the Stansted Express, for example, have increased in recent years with some trips now taking over 50 minutes; this is entirely wrong in terms of supporting a growing airport and wider airport capacity requirements in the South East.

Improving the railway line by providing extra tracks on the busiest parts offers an excellent opportunity to unlock thousands of new homes and jobs along the route, as well as enhancing international transport links:

- There are several ways of improving journey times, increasing resilience and providing new capacity on the railway, but the most effective way of achieving all three is by laying additional track. Providing two extra tracks on the busiest part of the line means that fast and slow services can be separated, allowing for quicker journeys, the ability to operate more trains and a reduced risk of delays.

- Four-tracking the railway from Broxbourne to Tottenham Hale, for example, would enable shorter journey times between Cambridge, Stansted and London, more frequent services where they are needed and improvements to the resilience and reliability of the route as a whole.
- As well as unlocking housing and employment potential by improving links between the hubs of London and Cambridge, this proposal would provide huge benefits to users and employees of Stansted Airport. Fast services to the airport are currently hampered by sharing track space with slower local services, and four-tracking would alleviate this pressure. The Airports Commission specifically recognised the need to make use of the potential available at Stansted Airport for the benefit of the whole of the south east, and four-tracking would represent a big step towards realising this aim.

Crossrail 2 is required to maximise the potential opportunities and underpin a successful corridor for decades to come

- Four-tracking alone will unlock significant growth potential along the WAML corridor, but these benefits would be hugely enhanced by Crossrail 2. While the existing WAML terminates at two London stations with limited opportunities for expansion – Stratford and Liverpool Street – Crossrail 2 would provide an outlet for many more trains to serve the line, enabling a step-change in service frequency. Crossrail 2 could allow up to 15 trains per hour to serve WAML stations on a new four-tracked section through the Lee Valley.

- Four-tracking followed by Crossrail could unlock up to 70,000 new homes and 25,000 new jobs in the WAML corridor alone. Tens of thousands of new homes could provide businesses from Cambridge to London with a substantial expansion of their labour market.

- The early delivery of four-tracking by 2024 will ensure that this growth can be kick-started ahead of Crossrail 2 opening in 2030.

Making the case for four-tracking and Crossrail 2

The West Anglia Taskforce has been set the challenge of making a compelling case for investment in this corridor and is working hard to gather the evidence needed to ensure a robust business case is submitted to the Government in summer 2016. Ahead of this, the Taskforce looks forward to supporting the work of the National Infrastructure Commission over the next few months as it analyses and examines potential schemes and provides its own evidence to Government.

Yours sincerely

Rt Hon Sir Alan Haselhurst MP

Chair of the West Anglia Taskforce

Lord Andrew Adonis
Chair - National Infrastructure Commission
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Our Ref:
Your Ref:
Telephone: [contact redacted]
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Date: 08 January 2016

Dear Lord Adonis

West Midlands Integrated Transport Authority and West Midlands Combined Authority Shadow Board - Submission on Critical Infrastructure Challenges

We welcome the opportunity to respond to the Commission's Call for Evidence on future infrastructure challenges. However, the West Midlands Metropolitan Area and the Midlands Connect Partnership would like to express serious concerns at the limited nature of the terms of reference which exclude the Midlands infrastructure transport requirements from the scope of this work. Excluding the Midlands' critical infrastructure challenges does not reflect the commitment to rebalance the UK economy or recognise the importance of the Midlands to the national economy.

The 'Midlands Engine' prospectus, as unveiled on 04 December 2015 in Birmingham by Business Secretary *Sajid Javid*, commits Government to back Midlands Local Enterprise Partnerships in promoting jobs and growth, boosting productivity and attracting inward investment whilst recognising the importance of improving the region's infrastructure to increase connectivity.

The Midlands Engine region has an economy of £222 billion each year and is home to over 11.5 million people. The area has played a strong role in the recovery of the UK economy. Over the last year, private sector employment in the Midlands grew more than three times faster than London and the South East.

The Midlands Engine and the Midlands Connect Partnership links the UK to the rest of the world through its network of freight and passenger airports, and connects the country through road network and rail links. Our region's infrastructure is at the heart of the national network and is therefore crucial for the Northern Powerhouse, Greater London and Midlands Engine to fully integrate and further maximise benefits to UK Plc.

Connectivity across the Midlands is essential for supporting and attracting businesses as well as highly skilled workers. Midlands Connect will develop the vision for our regional connectivity and set out the long term transport strategy for the Midlands Engine. Midlands Connect Partnership has identified six "intensive growth corridors" and four major hubs of economic activity across the wider Midlands.

Further to this, the growth and development of Birmingham Airport is of crucial importance both to the West Midlands Metropolitan Area and to the UK as a whole. Enhanced global aviation connectivity will help grow our export led economy still further, securing extra benefits and opportunities for the region. High Speed Two (HS2) will see Birmingham

Interchange station built in close proximity to Birmingham Airport. Enhanced connectivity between the HS2 station and the airport has the potential to generate an additional 750,000 passenger trips per annum at the airport as well as supporting the South East's aviation needs by improving connections to Heathrow via Crossrail at Old Oak Common.

Positive change is happening in the West Midlands Metropolitan Area with the current work of the West Midlands ITA, the emerging West Midlands Combined Authority and our close collaboration with the region's Local Enterprise Partnerships. The announced Devolution Deal will see an unprecedented step change in delivery to support our collective ambitions for economic growth. Transport infrastructure is firmly at the heart of those plans, enabling wider economic and social value.

This submissions reflects the views of the West Midlands Integrated Transport Authority and West Midlands Combined Authority Shadow Board, as well supporting the wider views of the Midlands Connect Partnership area, which has also submitted a technical response submission to the Commission.

We welcome the opportunity to discuss this further with you and the wider Commission members.

Yours sincerely



Cllr Roger Lawrence
Chair of the West Midlands Integrated Transport Authority

**West Midlands Integrated Transport
Authority and West Midlands Combined
Authority Shadow Board**

**Critical Infrastructure Challenges
Submission to Infrastructure Commission**

08 January 2016

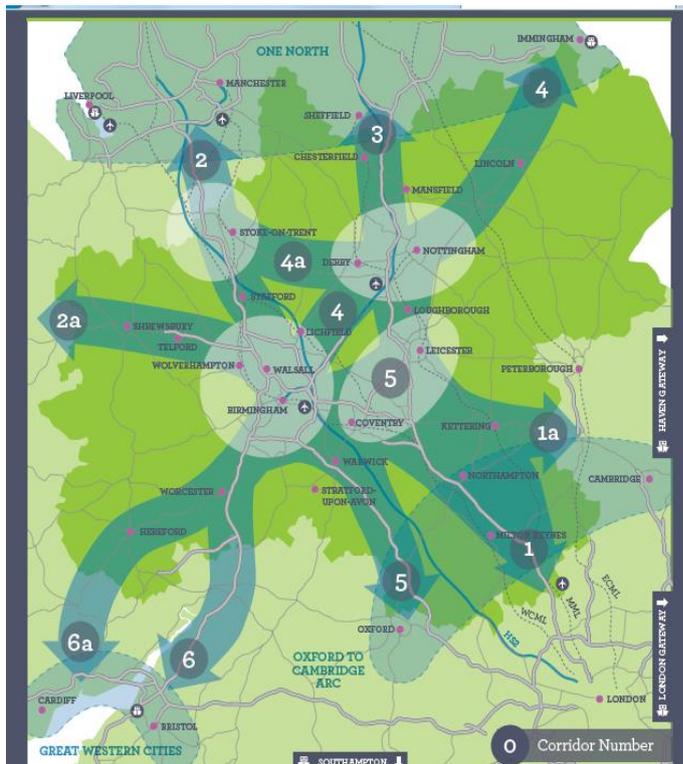
Our Story

The Midlands Engine and the Midlands Connect Partnership links the UK to the rest of the world through its network of freight and passenger airports, and connects the country through its road network and rail links. Our region’s infrastructure is at the heart of the national network and is therefore crucial for the Northern Powerhouse, Greater London and the Midlands Engine to fully integrate and further maximise benefits to UK Plc.

The Midlands has an economy of £222 billion each year and is home to more than 11.5 million people. The area has also played a strong role in the recovery of the UK economy. Over the last year, private sector employment in the Midlands grew more than three times faster than London and the South East.

Connectivity across the Midlands is essential for supporting and attracting businesses as well as highly skilled workers. Midlands Connect will develop the vision for our regional connectivity and set out the long term transport strategy for the Midlands Engine.

The Midlands Connect Partnership has identified six “intensive growth corridors” and four major hubs of economic activity across the wider Midlands. These are shown in the map below.



Evidence from Midlands Connect shows that improved highway reliability and regular average speeds across the Midlands along with higher line speeds on inter-regional rail and highway links can provide an economic benefit to the wider Midlands of up to £800m per annum by 2036 with 143,000 additional jobs when a 10% reduction in general travel times are achieved.

The Midlands has ambitious plans to build on these strong foundations. As the largest infrastructure project in Europe, High Speed 2 (HS2) will be an economic catalyst for the West Midlands with a strong focus on rebalancing the economy from the south east as well as providing the first strategic connections to the north. We are committed to building a transport network that will match the best in Europe and provide the strategic links to the north and the south of the UK.

Response to Critical Challenges - Northern Connectivity

Question 1: To what extent are weaknesses in transport connectivity holding back northern city regions (specifically in terms of jobs, enterprise creation and growth, and housing)?

The analysis supporting our work on Midlands Connect shows large economic benefits from improving road and rail connectivity in the Midlands intensive growth corridors, by reducing the costs of travel, increasing output by facilitating business clustering, and unlocking job creation in our growth areas. This will require concerted action to tackle the connectivity challenges that we have identified.

There are significant connectivity challenges that will constrain the ability of the Midlands to realise its ambitions for growth. Whilst the Midlands lies at the heart of the UK's road and rail networks, the mix of long-distance, regional and local travel needs is placing heavy demands upon them.

The Midlands motorway network is subject to heavy congestion, with traffic delays and poor journey reliability, meaning that businesses, commuters and leisure travellers have to schedule additional time into the journey to give confidence that they can arrive at destinations on time.

This wasted time significantly increases the direct costs of travel, impacts on business productivity and is constraining the potential for business growth. Increased demand for travel in the Midlands will place the system under further strain, increasing costs of travel and constraining job creation. The analysis completed to date as part of Midlands Connect highlights that we will need to tackle congestion hotspots as well as looking at the reliability, resilience and quality of journeys provided by the strategic road networks. Particular pressures include the South East of the West Midlands and the M6 between M54/M6 Toll and Birmingham Central (A38M).

There are fast, frequent rail links connecting large parts of the Midlands to the north and south, via the West Coast, Midland and East Coast Main Lines. However, there are major challenges travelling by rail between the Midlands cities, with long journey times and low service frequencies impacting on connectivity. This is a particular issue for the more rural areas such as The Marches, Worcestershire and Lincolnshire as this makes travel by rail inconvenient, leading to an increased reliance on car travel and reducing the scope for interaction between our cities. In particular, the slow speeds between the key regional cities of Nottingham and Birmingham highlights the need for improvements to be made

to the classic rail networks in advance of HS2 Phase 2 which is scheduled for completion after 2030.

As connectivity between the large urban centres becomes more important in future, these slow speeds will significantly constrain the capacity for growth in the cities across the Midlands. There is also an increasing problem of capacity and crowding on services entering and crossing Birmingham. This will cause problems both in accommodating growth in Birmingham and in improving rail connections across the whole Midlands.

Whilst the commission is focused upon connectivity, the importance of integrating growth plans and transport plans should be also recognised. Improving connectivity for the Midlands will create investment opportunities, but site development viability remains a long term constraint to the central urban areas absorbing the projected growth and realising the estimated anticipated economic benefit. Integrating strategic land use and strategic transport planning is crucially important.

Question 2: What cost-effective infrastructure investments in city-to-city connectivity could address these weaknesses? We are interested in all modes of transport.

At this stage of Midlands Connect we have not defined solutions. With the support from DfT we are now developing the Midlands Strategic Transport Strategy that will set out our priorities with a clear evidence base.

Highways England and Network Rail are in the process of undertaking Route Studies across the Midlands to inform investment strategies post 2020. There are also medium to long-term opportunities to deliver HS2 Growth Strategies to fully capitalise on the opportunities for the whole Midlands. Midlands Connect will provide the mechanism to inform and draw together these elements into a single strategy that delivers much more than the sum of the parts

HS2 will transform north-south travel, bringing Birmingham within 40 minutes and the East Midlands within one hour of London. It will also significantly improve connections between Nottingham and Birmingham. However, it will be critical to develop full connectivity packages to fully capitalise on the opportunities provided by new stations serving the West Midlands, East Midlands and North Staffordshire. It will also be important to reconfigure classic rail services to better meet the connectivity needs of the whole Midlands, including Milton Keynes and Northampton, Coventry and Leicester. However, prior to the arrival of HS2 and in particular the Phase 2 links, it is vital that the classic rail network continues to be enhanced and services improved to enable the continued growth of the Midlands economy.

Investment in Birmingham International Station, for example, in readiness for the arrival of HS2 and associated automated people mover between HS2 Interchange, Birmingham International/NEC and Birmingham Airport, would help optimise connectivity with other cities in the region, north and south. This is subject to one of only two successful 'Connecting Europe Facility' (CEF) grant awards in the UK.

The West Midlands Metropolitan Area has recently developed and adopted the West Midlands Strategic Transport Plan “Movement for Growth” which recognises the important contribution of local public transport services and walking and cycling investment, towards the improvement of strategic route connections. Investment in these modes should not be neglected when considering the wider strategic infrastructure as they are an essential part of the ‘whole journey’ for people and businesses by, amongst other things, providing access to rail connections for commuters and helping reduce local car trips on strategic roads.

Question 3: Which city-to-city corridor(s) should be the priority for early phases of investment?

The West Midlands Metropolitan Area’s population is forecast to grow by 444,000 people by 2035 (Office of National Statistics). This is the size of a Bristol, Liverpool, or Nottingham. The number of new homes which will need to be built to help accommodate this growth over 20 years is in the order of 165,000. The scale of new housing development increases when the wider journey to work area is considered, therefore requiring a joined-up, cross-boundary approach to housing development.

Initiatives to improve the West Midlands Metropolitan Area’s economy, air quality and quality of life all need to be supported by transport improvements. This is in the context of the - still valid - strategic economic priorities for transport policy identified in the Eddington Review:

- 1. Supporting the UKs successful agglomerated urban areas and their catchments**
- 2. Maintaining or improving the performance of the UKs key international gateways**
- 3. The key inter-urban corridors between these places**

In line with the above, there is a need for a successful integrated Metropolitan transport network supporting the growth and development of the West Midlands urban agglomeration with priority city to city/city to town corridors within this network based on the West Midlands High Speed Two Connectivity Programme corridors, which effectively “plug-in” the two HS2 stations to local networks to maximise their benefits for the West Midlands. As HS2 Phase 2 is developed further, there also needs to be access to Toton, effectively plugging the West Midlands into the three HS2 Stations.

Alongside this, a key infrastructure challenge we face is to ensure the effective and reliable operation of the Strategic Highway Network in the West Midlands. This is to serve the West Midlands Metropolitan Area’s regional and national needs whilst simultaneously serving movement of people and goods traversing the West Midlands. Wider use of the M6Toll is required as part of the solution to this challenge: we need to ensure that the M6Toll is better utilised and integrated with the wider highway network.

Better utilisation of the M6 Toll is of critical importance to the Midlands Engine. The West Midlands ITA and West Midlands Combined Authority Shadow Board are committed to working with Midlands Expressway Limited (M6 Toll owners) and Government to look at options for its better utilisation. However, there is a need for the Commission to acknowledge that the M6 Toll has a critical role to play nationally, due to its strategic importance and location on the National Strategic Highway Network.

As part of overall corridor approaches, the role of national and regional rail, including HS2 and rail freight, also need to be considered as priorities, including the Water Orton rail junction improvement which is the main rail passenger and freight bottleneck of the West Midlands network. Midlands Connect will strengthen the proposal to undertake a joint business case for central Birmingham capturing the wider economic benefits underpinning the case for investment. This will be carried out in partnership with Network Rail.

Furthermore, the West Midlands and Chiltern Route Utilisation Strategy requires construction of Camp Hill Chords, additional bay platforms at Moor Street, reinstatement of Platform 4 at Snow Hill as well enhanced infrastructure at Kings Norton Station and on the Water Orton corridor. These all form part of a package of improvements to enhance central Birmingham rail capacity which will bring national, regional and local benefits to the rail network and the economy.

Question 4: What are the key international connectivity needs likely to be in the next 20-30 years in the north of England (with a focus on ports and airports)? What is the most effective way to meet these needs, and what constraints on delivery are anticipated?

The Midlands Engine region accounts for 16% of all UK exports selling to over 178 countries worldwide.

The Midlands Engine region is well linked internationally. Inward investment projects grew by 130% between 2011 and 2015 based on a compelling Midlands offer of commercial opportunity, affordability, connectivity and quality of life. In the same period, the Midlands Engine region attracted 880 Foreign Direct Investment projects creating over 48,000 new jobs and safeguarding a further 23,000.

It goes without saying that connectivity to ports and airports will be vital for continued growth.

The international gateways at Birmingham Airport and East Midlands Airport are critical to the whole Midlands economy. Currently Birmingham Airport acts as a business gateway to major global markets, including China, and East Midlands Airport is the UK's most important air freight hub outside London. Both Birmingham and East Midlands Airports have ambitious growth plans for the future which will support the growth of the wider Midlands economy. Effective surface access links to these hubs are therefore critical to ensure they can operate effectively in the future. Both airports are challenged

in this respect, with East Midlands Airport only accessible via road and Birmingham Airport located adjacent to congested strategic road links and without direct rail links to the East Midlands.

Whilst Birmingham International Station provides a certain level of connectivity between Birmingham Airport and conventional rail services, these should be significantly strengthened through enhanced connectivity and interchange to the wider region and ultimately through the automated people mover and connections to the HS2 Interchange as promoted through the CEF proposal.

The Midlands Engine is also served directly by several ports including Grimsby and Immingham and Boston. Addressing the reliability and speed of connectivity will be essential to improve the efficiency and productivity of our businesses. With 16% of all UK exports there are significant gains to be made.

With the strong export market of the Midlands it is therefore vital to have wider connectivity to national ports. Our work to date has identified that there is a need to address reliability of the links, including enhanced road freight links (with a focus on speeds and reliability), between the Midlands logistics and manufacturing hubs and ports including Humber, Haven Gateway, Southampton, Bristol and Liverpool. Key sections of the network that need addressing include the M6, M5, A14, Birmingham Box and onward connections to ports such as Southampton.

Question 5: What form of governance would most effectively deliver transformative infrastructure in the north, how should this be funded and by whom, including appropriate local contributions?

The current proposals regarding Sub-National Transport Bodies and Combined Authorities (at regional levels) are appropriate and effective forms of governance in the Midlands Engine region to deliver our transformative infrastructure.

London's Transport Infrastructure

Question 1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

-

Question 2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

-

Question 3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

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Question 4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

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Question 5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

Other successful global economies ensure all of their major metropolitan areas have world class urban and regional transport systems and effective national and international connectivity, including links with the capital city. A lesson for London is to ensure an effective HS1 – HS2 link in London to allow direct international high speed rail services for major metropolitan areas of the UK.

National Infrastructure Commission call for evidence: London's transport infrastructure

Written evidence submitted by Chairman of Western Rail Access to Heathrow Stakeholder Steering Group

Introduction

The Western Rail link to Heathrow is a scheme confirmed in the Hendy Review as a priority for delivery yet with completion delayed to c 2024. This scheme has been in development and promoted by Thames Valley Berkshire LEP and its predecessors to answer the needs of business and leisure passengers to reach Heathrow by rail from the west. The scheme is supported by business and local authorities across the south west, south Wales and Thames Valley representing the business and residential communities whose access to Heathrow will be approved when the scheme is delivered.

The scheme also offers the opportunity to create a through route from the west to Paddington so enhancing capacity, resilience and passenger options and generating benefits to London and its hinterland beyond those originally planned and forecast.

A western rail link to Heathrow is deliverable, affordable and sensible solution to an acknowledged gap in the UK's strategic transport infrastructure. The link can be delivered in a relatively short period of time, requires minimal disruption to the existing transport network, existing properties and has minimal visual impact.

Although the scheme has been confirmed in the Hendy review it has met regular delays and requires drive from government through the DfT, BIS and Treasury. The business case is strong and ROI swift. The benefits to UK plc justify its urgent delivery.

Heathrow is one of the few international hub airports which does not have access to the economic hinterland of its city location. The economic importance of such a link is demonstrated by:

- 70% of foreign owned businesses establishing in the UK locate within 60 minutes of Heathrow;
- 75% of businesses in the Thames Valley state proximity to Heathrow as the primary factor for their choice of location;
- 202 of the UK's top 300 companies are located within 25 miles of Heathrow.

The opportunity of improving the connectivity and speed of access to Heathrow and to London of 12 million people across the South West, South Wales, West Midlands, South Coast and Thames Valley is being missed.

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

We question the reference to commuter hinterland. We would ask that the commission recognises the interdependencies in the commuter patterns and business structures and recognises the strength of and access to a wide economic hinterland as offering additional benefits to greater London.

- Transport – The west is relatively well served by rail transport links in to and out of London but lacks the rail transport infrastructure to make orbital journeys around London. The Western Rail Link to Heathrow scheme due to be delivered by the end of Network Rail's Control Period 6 programme is a vital link for the wider Thames Valley and further afield in providing a direct transport link to Heathrow.
- Economy – Access to and from business, labour and employment in the hinterland will add to the London's critical mass as a global centre, provide supply chain opportunities and other synergies.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?

What might their potential impact be on employment, productivity and housing supply in London and the southeast?

The **Western Rail Link to Heathrow (WRLtH)** scheme offers economic and environmental benefits to London by strengthening its economic hinterland as well as offering very significant benefits to the hinterland. It will improve access to Heathrow for 12 million people to the west of London, particularly the Thames Valley and including the far south west and south Wales. It has the potential to deliver a through route to Paddington via Heathrow.

- The business, economic and environmental case for the scheme, first assessed in 2011 and now being refreshed and based on the current two runway airport, is strong – £1.5 billion of efficiency savings, £800 million of additional economic activity, 42,000 new jobs, modal shift from road to rail, one million fewer road journeys and 5,200 tonnes less CO2 released into the atmosphere – and are projected to be stronger.
- The scheme is particularly important in retaining and attracting major business to the Thames Valley and beyond. 75% of businesses state access to Heathrow as a primary factor in their choice of location
- The maintenance and enhancement of the strength of the economic hinterland will have additional benefits to London. The potential modal shift of traffic to Heathrow from road to rail (currently estimated at c20% from Reading and Slough) will have a positive impact on traffic flows on the strategic road network to the immediate west of London.
- The scheme is now anticipated to enable an additional through route from the west to Paddington, so creating added capacity, resilience and passenger options on the rail network and potential greater modal shift. This will have additional economic and environmental benefits to London and the hinterland.
- The scheme has been confirmed in the Hendy Review but to a later timetable. This largely reflects the past and recent delays in delivery. It will now not be operational until 2024 delaying the realisation of these significant benefits and potentially deterring business commitment further. . It was originally anticipated that the scheme could be open for use before 2020.

Action: We would like to see the National Infrastructure Commission reviewing the scheme delivery plan and working with delivery agencies to identify and implement actions that bring forward the operational date. Schemes which have a strong business case, strong local and regional support, and a clear identified need should be prioritised.

Action: We would like to see the National Infrastructure Commission reviewing the Development Consent Order (DCO) process in general to look at the burdens and delays inherent within the process to identify ways in which it can be streamlined.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

No comment.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?

What innovative funding mechanisms could be considered to support delivery of key schemes?

No comment.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

No comment.

Contact: Ruth Bagley, Chairman Western Rail Link to Heathrow Stakeholder Steering Group

[email redacted]

Submission dated: 8 January 2016

7th January 2016

Lord Adonis
National Infrastructure Commission
1 Horse Guards Road
London
SW1A 2HQ

Submission from Westminster City Council to the National Infrastructure Commission

Dear Lord Adonis,

Westminster City Council is grateful for this opportunity to contribute to the work of the National Infrastructure Commission and, as the local authority at the heart of the UK's global capital, we hope that we can form a strong and constructive relationship with the Commission moving forward.

Central London is the engine of the UK economy: Westminster alone functions as a national and international centre for business, shopping, arts and culture and entertainment; houses over 600,000 jobs, 15% of all of London's employment; and generates 4% of UK GVA. Infrastructure is critical to maintaining and enhancing this contribution for the benefit of UK plc: it is essential that efforts to define strategic infrastructure priorities should properly reflect the national importance of the centre of London and that this is reflected in a locally responsive and sophisticated approach to infrastructure investment in the capital. The role of London boroughs, including Westminster, in steering this investment is critical.

This response is a brief contribution on the strategic options for future investment in large-scale transport, including public realm infrastructure improvements across London and energy supply and resilience.

This year, London surpassed New York in the Global Financial Centres Index, claiming the no. 1 spot.¹ However, of the ranking criteria London's infrastructure is rated as underperforming, potentially casting doubt on the perception that the city is serious about its growth ambitions.

Transport and public realm infrastructure are critical to enabling and facilitating the planned growth required across London. Devolution of Government finances and powers will play a key role in making this happen. Westminster City Council supports the significant investment being made in transport and public realm infrastructure in response to increasing residential and working

¹ The instrumental factors used in the GFCI model are grouped into five key areas of competitiveness (Business Environment, Financial Sector Development, Infrastructure, Human Capital and Reputational & General Factors) http://www.longfinance.net/images/GFCI18_23Sep2015.pdf

populations and London's continued global-city status. However, the future of London's transport infrastructure is not limited to high-profile, large-scale investments, but also depends critically on improving the way in which investment in existing infrastructure is prioritised, directed and delivered. It is essential that the planned reforms to the local government finance system, including the larger role envisaged for boroughs in the commissioning of capital projects, provides London with the fiscal autonomy to weigh up competing priorities and direct public and private investment in a way which maximises benefits relative to costs.

In particular, boroughs could significantly enhance the potential benefits of large scale infrastructure investment **if long-term, predictable and real financial incentives are made available**. Areas such as the West End of London, the economic and cultural heart of the capital, provide particular opportunities to leverage investment through innovative thinking. Westminster City Council is working with partners, including Transport for London, the Greater London Authority, the London Borough of Camden and the private sector, through the West End Partnership to provide greater strategic leadership and a common voice for the West End. We outline below some ideas on realigning growth incentives and leveraging investment in key infrastructure schemes in the West End, in conjunction with the opening of Crossrail 1 and the development of Crossrail 2, which we would be very interested to discuss further with the Commission.

Similarly, a secure, resilient and planned energy supply is a critical factor in London and Westminster's growth. The resilience and sufficiency of energy supply is a major reputational and practical risk to economic growth and performance in the West End in particular, with theatres and other businesses experiencing power outages and major constraints placed on future growth and development by insufficient energy supply. Over the past year, the Greater London Authority has worked with the Number 10 Policy Unit, HM Treasury, the Department of Energy and Climate Change, UK Power Networks and the Core Cities to develop potential new arrangements for the required investment, discussed further below.

An integrated approach to both these issues will be essential to meeting the economic, environmental and social demands of a rapidly growing global city. We look forward to working with the Commission on these challenges and we would be very happy to meet and discuss our response in more detail if it would be helpful.

In the meantime, if the Commission has any questions or would like more detailed information or analysis on any of the points touched on briefly below then please do not hesitate to contact me.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'P. Roe', with a horizontal line extending to the right.

Cllr Philippa Roe

Leader of Westminster City Council

Transport infrastructure in London

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

The economic and social challenges facing London are well articulated in various strategic documents, including the Mayor's London Infrastructure Plan 2050 and Westminster City Council's City Plan. Key points include:

- The number of people who live and work in London is rising rapidly. In February 2015, the capital reached its highest population ever – 8.6 million people – and is set to grow to 10 million by 2030. Such significant growth means that large amounts of development will be required for the foreseeable future, including in areas such as affordable housing and transport.
- A clear set of policy approaches will also be required to address the socio-economic and environmental challenges that will be created or exacerbated by this rapid growth. These include the potential for a growing polarisation of the labour market and skills gap; addressing issues around air quality, climate change, heritage and residential amenity; and ensuring that investment – including foreign direct investment, on which London's comparative position has weakened in recent years – is directed to areas of need.

The density of activity and daytime population of central London means that it is particularly impacted by these points; at the same time, however, there is significant potential for well-targeted infrastructure investment in central London to help address these issues across the capital and beyond. In particular:

- Infrastructure will be required to alleviate severe overcrowding on London and the South East's rail networks including on Network Rail and London Underground services
- In central London, managing the dispersal of people from London Euston once High Speed 2 (HS2) opens in 2033 requires investment on the scale of Crossrail 2 (CRL2) as well as public realm investment to mitigate pedestrian pressures; similar measures will be required in light of a decision on airport capacity in the South East
- Inevitably, a city with a more diverse, older, population means that inclusion and accessibility will become increasingly important issues

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

- *How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?*
- *What might their potential impact be on employment, productivity and housing supply in London and the southeast?*

In central London, considerable growth will be accommodated within the Central Activities Zone (CAZ) and the City Council is working alongside the LB of Camden, the GLA/TfL, the private sector and development industry through the West End Partnership (WEP) to deliver significant investment in the West End to support and encourage that growth.ⁱ For example, at Tottenham Court Road £1bn of improvements are being delivered through the development of Crossrail 1 (CRL1), the biggest investment in the West End in recent times, which is fully supported both regionally and locally.

Large-scale transport infrastructure investment should be prioritised in a way which allows for alignment with identified development opportunity areas. For example, Paddington, Victoria and Tottenham Court Road are designated as Opportunity Areas (OAs) both within the Westminster City Plan (November 2013) and the Mayor's London Plan (March 2015) and are considered to have significant capacity to accommodate new housing, commercial and other development linked to existing or potential improvements to public transport accessibility. For example, the Victoria Opportunity Area is projected to provide at least 1,000 new homes and 4,000 new jobs from 2011 to 2031; similarly the Tottenham Court Road Opportunity Area is projected to accommodate at least 400 new homes and 5,000 jobs from 2011 to 2031. Victoria is changing from an area previously dominated by Government Departments to an area in which banking, finance and corporate HQ buildings wish to locate, while the Tottenham Court Road area has a more varied economy (including a world renowned creative sector in Soho as well as being a major tourist destination).

However, large scale infrastructure improvements will not, in themselves, maintain London's position as a successful global city. London already has well-established transport infrastructure and the prioritisation of investment should also seek to improve what is already in place. For example, some areas of London have good transport links but low levels of housing and commercial density.

An integrated, balanced approach to transport and development modelling and investment appraisal is needed in order to unlock sustainable development and address the effects of transport infrastructure on investment decisions, growth and productivity. This will need to be sufficiently sophisticated to balance a range of investment needs, including investment in walking and cycling facilities and public transport (such as radial routes in outer London and the proposed extension of the Bakerloo Line); social infrastructure and technological innovation such as greater uptake of electric vehicles in commercial fleets and private use. We strongly support the development of an integrated transport modelling framework, collaboratively with TfL and the London boroughs, to prioritise infrastructure investment for such a complex, historic and dense city. This includes looking across environmental and public health-related, as well as economic and transport-related, policy drivers in order to set out the right collective investments in current infrastructure, potentially including ambitious walking and cycling strategies to keep London moving.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

The City Council is a longstanding supporter of Crossrail 2 (CRL2). CRL2 presents an opportunity to help alleviate severe overcrowding on London and the South East's rail networks including Network Rail lines and London Underground lines. London's population is projected to reach 10 million by 2030 and supporting and maintaining a functioning, accessible and inclusive transport system for this population is a key priority for us.

However, we are currently seeking assurances that a proper assessment of the distinctive impacts and benefits for CRL2, and how these are mitigated or harnessed, will be undertaken at the various stages of the project, not just at its outset. Growth from CRL2 must recognise the need to improve existing situations as well as provide new opportunities. This should include a proper assessment of local impacts as well as route-wide effects to ensure that funding and delivery mechanisms for necessary mitigation or improvement measures are properly accounted for. Clear borough involvement from the outset in relevant governance mechanisms is critical in this regard.

Managed effectively and collaboratively, CRL2 can maximise its anticipated benefits, providing a vehicle for effective integration and planning of transport systems across London to enable major development and job creation:

- Through effective coordination of the delivery of CRL2, there is a significant opportunity to make better use of our current transport system and help relieve congestion on existing railway lines (including Underground lines) to reduce pressures across London. A key example is CRL2's role in managing the dispersal of people from London Euston once High Speed 2 (HS2) opens in 2033.
- There is potential to draw on the lessons of CRL1 to maximise the integration of public realm/transport interchanges and property development above and around CRL2 stations, including commercial, retail and residential development, delivered in partnership between the private sector, local authorities and other agencies (building, for example, on the new partnership arrangement between Transport for London and Network Rail for CRL2 itself). There are two CRL2 stations proposed within Westminster at Victoria and Tottenham Court Road, identified as having capacity for major housing growth, regeneration and job creation which should be supported by investment in public transport infrastructure. CRL2 is central to the West End Partnership (WEP)'s ambitions to integrate, coordinate and deliver £500m of improvements around Tottenham Court Road, including improvements to the public realm in and around the new CRL2 station entrance to create better pedestrian spaces and new walking routes. Understanding the role of property value uplift and how this can be used to maximise the benefits of investment will be essential.
- CRL2 presents significant opportunities for more employment across London, allowing for improved accessibility to employment as well as contributing to local job creation, including but not limited to construction works. Westminster's objectives in terms of employment include upskilling our resident population and removing barriers to employment for our residents, especially in the north of the city which has high levels of deprivation. Lessons should be drawn from Crossrail Limited's work with local employment brokerages, the Tunnelling and Underground Construction Academy (TUCA) and its role in offering opportunities to unemployed

residents within boroughs along the route. To make this activity more sustainable, viewing employment and skills activity as an integral part of infrastructure investment packages has significant potential to unlock new models of investment and delivery, including the potential for the sharing of risk and reward between London and HM Treasury in order to reinvest savings from reducing unemployment into successful local programmes.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

- *What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?*
- *What innovative funding mechanisms could be considered to support delivery of key schemes?*

The main barrier to unlocking development opportunities is the availability of funding to implement projects and/or attracting sufficient private sector investment. Social infrastructure, such as housing, education and health facilities, will also be placed under more demand by a growing population – with an increasing number of older people – and will need to be addressed concurrently. In addition, the focus on capital and infrastructure operating costs should not obscure the importance of revenue spending required to manage and maintain public realm including maintaining heritage and cultural assets and facilitating services such as waste disposal, budgets for which are under severe and rising pressure.

Boroughs could significantly enhance the potential benefits of large scale infrastructure investment **if long-term, predictable and real financial incentives are made available**. Individual boroughs, and in particular Westminster, are in the best position to promote inclusive growth that generates direct benefits from London wide transport and infrastructure investment. There is a tremendous opportunity to bring together a number of different levels of public sector delivery of infrastructure by combining national, regional and sub-regional funding investment streams. Transport budgets for London, already partly made up from a proportion of business rates, could be further devolved and be part of a mix of other funding streams such as Tax Increment Finance, a more nuanced ‘growth accelerator’ financing model including broader economic targets such as reducing long term unemployment, a visitor levy or a share of climate change levy revenues. Such models could help create an incentive for growth in those areas that otherwise make no direct gain but incur new budgetary pressures. We would be interested to discuss this further as we believe that with the right financial package, Westminster through the West End Partnership, could unlock significant growth across the West End in coordination with the opening of CRL1 and CRL2.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

The Global Financial Centres Index, the Economist Units Liveability Analysis and the European Cities Monitor all provide useful perspectives on these questions. Ernst and Young track this form of competitiveness and there is now strong competition particularly from German cities. Lack of skills and the comparative costs of doing business are among the key challenges for London.

Germany has one of the world's largest and most sophisticated transportation systems. Whilst there is a split between Government funding and Public Private Partnership funding, a national transport infrastructure funding agency (Verkehrsinfrastrukturfinanzierungsgesellschaft) was established in 2003 whose task it is to distribute the income from road tolls among road, rail and waterways and to support projects realised under a public-private funding scheme. Redistribution of cost and demand is something Westminster is particularly interested in and we would be keen for the Commission to explore this model in more detail.

<http://www.internationaltransportforum.org/statistics/investment/Country-responses/Germany.pdf>

We are also interested in exploring the other examples put forward in London Councils' response:

- PwC's Funding and Financing Study explores in depth international models for funding infrastructure, which have been considered for their applicability to London.
- Toronto, Canada, is responding to its city congestion problems with a two-stage investment in its transport system, focusing on bringing economic growth and job creation. It will build, extend and upgrade a series of light rail, underground and bus routes over a 25 year period.
- Paris is establishing a city-regional authority to improve its city transport connectivity with its suburbs. It is building a Grand Paris Express to link the centre of Paris with its airports and major economic areas in the greater Paris region.

Electricity interconnection and storage

1. What changes may need to be made to the electricity market to ensure that supply and demand are balanced, whilst minimising cost to consumers, over the long-term?

•What role can changes to the market framework play to incentivise this outcome: •Is there a need for an independent system operator (SO)? How could the incentives faced by the SO be set to minimise long-run balancing costs?

•Is there a need to further reform the “balancing market” and which market participants are responsible for imbalances?

•To what extent can demand-side management measures and embedded generation be used to increase the flexibility of the electricity system?

Energy infrastructure is a particularly pressing issue for Westminster. Our work with UK Power Networks on their future Business Plan suggests an urgent need for investment of at least £400 million in electricity supply infrastructure in central London, and the Mayor is already aware that existing shortfalls are particularly constraining growth in Victoria and the West End, including causing power outages affecting theatres and other businesses. Given this we have taken a leading role in working with the Mayor to support the case for the provision of infrastructure in advance of development actually taking place, and have written to Ofgem to reinforce the case for the changes to the regulatory regime needed to achieve this.

We strongly endorse the move towards locally produced energy. There is a role for the Mayor in pushing for a regulatory regime more supportive of local decentralised energy provision. We also note that electricity demand driven by the decarbonisation agenda may rise dramatically. Therefore, carbon taxes will continue to be an important tool in ensuring a switch to lower carbon electricity and further investment into researching energy storage. Continued investment is also required in carbon storage capacity and technology, perhaps combined with subsidy for small scale electricity generation.

Over the past year, the Greater London Authority has worked with the Number 10 Policy Unit, HM Treasury, the Department of Energy and Climate Change, UK Power Networks and the Core Cities to develop new arrangements for the required investment ahead of demand. Two potential models emerged (see below) and we recommend that the Commission continues to develop these ideas as part of its review into these strategic challenges:

- One approach would be to allow distribution network operators to seek Ofgem’s approval for increased investment in a specific area, but on the basis that the cost of the accelerated investment would be recovered from connecting customers as they emerge.
- The second option, which the GLA developed in conjunction with the Infrastructure UK team at HM Treasury, is based upon a private development company being established, potentially by a local or strategic authority in respect of any area, to fund up front investment. This would be done on the

basis that the company recovers costs as connections are made by developers, with an additional premium to attract the required investment.

The London Electricity Infrastructure Review, a Technical Working Group Report by Ramboll, also makes several points which we suggest that the Commission also look at in detail:

- The essential change is for investment in London's electricity infrastructure to become more proactive. Infrastructure providers should have greater engagement in development strategies in order to fulfil a role that actively facilitates growth and anticipates demand rather than inhibiting by being reactive.
- The current application of the price control framework discourages proactive investment. A change in emphasis could facilitate such investment.
- The primary constraint in central London, physical space, will require co-operation by many public and private sector bodies in order to find a solution.
- Arguably, the initial phases of a strategic solution are partially underway with the reinforcement work being undertaken by National Grid in north London. This will pave the way for new bulk supply routes to new substations serving consumer voltages, as identified in UKPN's business planning for the next 10 years, but insufficient timely investment in the development of London's distribution network presents serious risks to London's economic growth, regardless of this current reinforcement work.

2. What are the barriers to the deployment of energy storage capacity?

•Are there specific market failures/barriers that prevent investment in energy storage that are not faced by other 'balancing' technologies? How might these be overcome?

•What is the most appropriate scale for future energy storage technologies in the UK? (i.e. transmission network scale, the distributed network or the domestic scale.)

Gas prices are a major determining factor in the cost of energy. Energy storage capacity, particularly in the form of alternative and "reserve" sources of energy, are exposed to the volatility of gas prices. Because of this dominance, the future scale of energy storage capacity will need to be large – however, a strategy that includes all three scales (transition, distribution and domestic) would balance the risk of a lack of technological progress in one area.

There is also a need for legislative change to require utilities to cooperate with boroughs' (and the Mayor's) strategic planning and to enable London level scrutiny and approval of utility franchises to meet these objectives. We welcome the steps the utilities have taken to work with the City Council and to recruit 90 local staff. In a recent response to Ofcom on broadband provision we called for a 'duty to cooperate' between utility companies and local authorities and believe this would be particularly beneficial in regards to energy provision.

Our work with partners in this area makes clear the need for all London stakeholders to accelerate thinking about the future direction of energy provision and infrastructure over the medium-to long-

term, moving towards a “smart grid” to enable the most effective use to be made of existing (and help manage the need for new) infrastructure while providing choice and better value for consumers.

3. What level of electricity interconnection is likely to be in the best interests of consumers?

•Is there a case for building interconnection out to a greater capacity or more rapidly than the current ‘cap and floor’ regime would allow beyond 2020? If so, why do you think the current arrangements are not sufficient to incentivise this investment?

•Are there specific market failures/barriers that prevent investment in electricity interconnection that are not faced by other ‘balancing’ technologies? How might these be overcome?

One important market failure which we would highlight is a lack of clarity around return on investment. Investors are not clear on the longer term public sector appetite, or the market potential, for new technology. As part of its work the Commission could usefully consider how this could be addressed.

National Infrastructure Commission – Call for Evidence

London's Transport Infrastructure

- The UK's most valuable infrastructure is our “green and blue” infrastructure — the natural capital that supports communities, nature and economic activity. As such the need to protect and enhance natural infrastructure should underlie all the work of the National Infrastructure Commission.
- Development of new infrastructure can deplete our natural infrastructure, increasing risks like flooding, and damaging ecosystems. However, if designed and managed appropriately new infrastructure can benefit our built and natural environment and help it to be resilient to a changing climate and increasing population.
- This should be facilitated by coordinated action. For example, the Commission should consider linkages between its consideration of the London Transport System and other London strategies and plans, including the London Sustainable Drainage Action Plan and the aims of the London Green Infrastructure Taskforce.
- The Commission should consider how changes to the London Transport System can offer multiple benefits for example flood risk, biodiversity, and health and well-being. This can be done through incorporating well designed sustainable drainage systems.

Introduction

We welcome the formation of the National Infrastructure Commission. This task should not be undertaken in isolation, but considered alongside the wider built and natural environment. Infrastructure needs to be resilient to our changing climate, increasing urbanisation and population and it needs to work with the environment and communities.

The Issues

- The Highways Agency estimates that 70 per cent of earthworks failures are due to deficiencies in the drainage system. Similarly, London Underground considers that drainage-related issues are responsible for the vast majority of significant earthwork failures over the last 20 years.
- Less than a quarter of our water bodies are considered healthy. In order to reach water quality targets established in the Water Framework Directive, it is important that any growth in infrastructure does not lead to the deterioration in our water bodies. Much transport infrastructure such as roads cause a significant amount of water runoff. This runoff not only carries pollutants with it but severely impacts the capacity of our drainage systems resulting in increased combined sewer overflows allowing untreated sewage to flow directly into our rivers and oceans. In addition once our drains reach capacity it can cause surface water flooding carrying pollutants with it.

- 60 per cent of species we know about are in decline; as with all new development there are opportunities to help reverse this decline and help achieve our biodiversity targets. The National Infrastructure Commission should ensure that its recommendations make the most of these opportunities.
- As the climate changes, we are expecting an increase in winter rainfall and also an increase in the number of severe rainfall events. Combined with a reduction in permeable surfaces through the need for increase in housing, this will result in increased risks from surface water flooding.
- In London, the role of managing surface water flood risk lies with Lead Local Flood Authorities which are generally London Borough Councils. Lead Local Flood Authorities have produced Surface Water Management Plans (SWMPs) which gives the roads authorities clear roles where the roads form a key part of the drainage or alleviation of flood risk. Roles include retaining data relating to location and serviceability of existing road drainage; designing road drainage to minimise surface water runoff; and planning exceedance routes using roads surfaces for overland flow. It is important that when looking at growth of the London Transport System that Lead Local Flood Authorities are consulted and areas of high flood risk are avoided.

The London Transport System

Transport infrastructure in London is vital to the city. It is vulnerable to extreme weather events such as flooding, but it can also add to this risk. In considering the development of new infrastructure we need to ensure that it does not increase flood risk.

In the period from 1992 to 2003, over 1,200 flooding incidents and 200 station closures were recorded by London Underground Limited. Of these approximately half were related to flash flooding. Flooding of the London Underground between September 1999 and March 2004 cost approximately £14.6 million in passenger delays. Our current drainage system is struggling to cope and increasing storm events will require significant modification to maintain even current service levels. **The National Infrastructure Commission should ensure that it adequately considers the sustainability of its proposals and recommend appropriate investment in natural infrastructure.**

There are many existing plans and strategies in London, notably the London Infrastructure Plan and the draft London Sustainable Drainage Action Plan. Any consideration of London's Transport System needs to take such plans into account. For example, the draft London Sustainable Drainage Action Plan states *"transport sector buildings can lend themselves to green/brown roofs and also realise the benefits of insulation and reduced long-term maintenance"* and that *"retrofitting sustainable drainage should form part of already planned maintenance, repair and improvement programmes"*. The Government's Manual for Streets (2007) stated that *"the use of SUDS is seen as a primary objective by the Government and should be applied wherever practical and technically feasible"*. These insights should be reinforced by the Commission.

The London Infrastructure Plan places high emphasis on improving the London Transport System but also on delivering a network of green infrastructure to provide flood protection, shade, biodiversity, cleaner air, a greener environment visually, pedestrian and cycling routes and space for recreation. These two should not be seen in isolation. **The National Infrastructure Commission should consider how improving the London Transport System can at the same time improve London's green**

infrastructure network. Sustainable drainage systems if designed and managed appropriately are themselves an important form of green infrastructure.

Walking and cycling are important modes of travel, offering a more sustainable alternative to the car. **Safe routes for walking and cycling should be considered as part of London's Transport System.**

All stages of the development of major projects such as Crossrail 2 should include consideration of ways to enhance natural infrastructure and resilience. This should include the design of projects and the sourcing and disposal of building materials; Crossrail set an important precedent in this regard through its association with the Wallasea Island project, which made good use of spoil and contributed to natural flood defences and biodiversity. This kind of large-scale ambition should be repeated and matched by attention to more local resilient design options in new projects, including sustainable drainage.

Sustainable Drainage Systems (SuDS)

It is important that our transport infrastructure does not negatively impact on other vital infrastructure, including our drainage systems. Yet transport infrastructure can also help alleviate this risk through incorporating sustainable drainage systems into design and management. If these are designed appropriately they can also deliver benefits for wildlife and society.

Sustainable drainage systems seek to manage rainfall in a way similar to natural processes, by using the landscape to control the flow and volume of surface water, prevent or reduce pollution downstream of development and promote recharging of groundwater. Sustainable drainage systems can be vital areas of habitat and stepping stones for wildlife in the urban environment and can also reduce the urban heat island effect and improve the quality of the water passing through it. This also plays a role in making the urban environment more aesthetically pleasing and providing health and well-being benefits.¹

London is also in an area of water scarcity and with climate change we are expecting hotter summers. In considering sustainable drainage systems within the transport system these measures can help with water resource management through rainwater harvesting and reuse. Such SuDS techniques can capture, or harvest, rainwater which can then be used for functions that do not require treated water, such as flushing toilets and irrigation. In addition using methods such as green roofs, recreational roofs, wildflower blankets and green walls can replace some of the evaporative cooling lost through urbanisation.

The National Infrastructure Commission should consider sustainable drainage systems within their plans for the London Transport System so that infrastructure is resilient to climate change, alleviates pressure on drainage infrastructure, and also benefits wildlife and communities.

Case studies

- A green roof was retrofitted onto a tube depot in Ruislip gardens and water runoff rates were compared with a control roof. The green roofs reduced the peak flow to under a

¹ WWT has created guidance on how to design sustainable drainage systems for multiple benefits. It can be downloaded from http://www.wwt.org.uk/uploads/documents/1400927422_SustainableDrainageSystemsGuide.pdf

quarter of that of the control roof and delayed the peak flow time up to 2 hours 45 minutes. The green roofs were additionally designed to encourage pollinating species.

- Nottingham Green Streets project designed to capture runoff from 5500 m² of highway from a total surface area of 7100 m². The scheme was designed to manage surface water runoff from a 1:30 year event and to always intercept and treat the, often polluted highway runoff. Evidence indicates a 33 per cent reduction in the flow reaching the sewer during a 1 in 1 return period storm.
- If designed and managed correctly sustainable drainage systems can be more cost effective than installing traditional drainage systems. For example costings for incorporating SuDS into the development of a rail freight terminal in Telford, Shropshire were compared with traditional sewerage costs. To incorporate SuDS rather than sewer features catering for a 1 in 30 year flood event would result in savings in the order of £253,000 (for basic works costs excluding preliminaries and design and supervision and removes the effects of the disposal of surplus material).

The SuDS have been accommodated within areas that would have been used for landscaping and have enhanced the attractiveness of the Terminal. The SuDS features have also provided enhanced habitats and helped to secure a more continuous green network through the site with positive effects on biodiversity. The slow conveyance and attenuation of flows help to remove pollutants and reduce the diffuse pollution load which would otherwise have been carried by the surface water sewer system into the watercourses. In addition it is believed that the use of SuDS has saved in excess of 100 HGV journeys (probably significantly more) or in excess of 8,000 vehicle miles.

As most of the SuDS features are visible within the site, they are subject to daily oversight by the staff. All aspects of the inspection and maintenance of the SuDS system are capable of being safely undertaken by the staff of the Terminal or outside landscaping contractors. With a piped system, diagnosis and location of the source of pollution in pipe networks can be very time consuming and expensive. A piped system would require at least an annual visit by specialist contractors. This may require several days if pipe jetting is required. Potentially unscheduled, reactive visits may be needed as well e.g. to respond to blocked gullies or choked flow control devices.

Concluding remarks

We recommend that National Infrastructure Commission considers its remit as part of the wider built and natural environment and promotes the development of infrastructure that is resilient to climate change, and contributes to biodiversity and resilience. We recommend the use of sustainable drainage systems wherever possible which are designed to optimise multiple benefits, reducing flood risk, reducing the urban heat island effect, improving water runoff quality, providing biodiversity benefits and providing communities with an enhanced sense of place and wellbeing.

For further information, please contact:

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National Infrastructure Commission Call for Evidence

Woodland Trust Response

January 2016

The Woodland Trust appreciates the opportunity to respond to the National Infrastructure Commission call for evidence. We recognise the importance of a modern infrastructure system and as such are disappointed that the questions do not make any reference to the importance of green infrastructure and the need to design infrastructure in ways that respects the landscapes and habitats that have done so much to shape our national identity. We hope that our submission will show the Commission that green infrastructure, particularly irreplaceable ancient woodland and newly planted woods and trees need to be a key component in the Commission's considerations on long term infrastructure provision, as per the Government's manifesto promise to 'protect your countryside, green belt and urban environment'.

As the UK's leading woodland conservation charity, the Trust aims to protect native woods, trees and their wildlife for the future. Through the restoration and improvement of woodland biodiversity and increased awareness and understanding of important woodland, these aims can be achieved. We own over 1,250 sites across the UK, covering around 23,000 hectares (57,000 acres) and we have 500,000 members and supporters.

Ancient woodland is defined as an irreplaceable natural resource that has remained constantly wooded since AD1600. The length at which ancient woodland takes to develop and evolve (centuries, even millennia), coupled with the vital links it creates between plants, animals and soils accentuate its irreplaceable status. The varied and unique habitats ancient woodland sites provide for many of the UK's most important and threatened fauna and flora species cannot be re-created and cannot afford to be lost. As such, the Woodland Trust aims to prevent the damage, fragmentation and loss of these finite irreplaceable sites from any form of disruptive development.

Connecting Northern Cities

1. To what extent are weaknesses in transport connectivity holding back northern city regions (specifically in terms of jobs, enterprise creation and growth, and housing)?

No Comment.

2. What cost-effective infrastructure investments in city-to-city connectivity could address these weaknesses? We are interested in all modes of transport.

The Trust would prefer to see investment in public transport solutions rather than road building. Such an approach would minimise environmental impact.

3. Which city-to-city corridor(s) should be the priority for early phases of investment?

The Trust cannot comment on specific city to city connection priorities. But we would like to raise the issue of the importance of considering the natural environment from the outset. Whilst the Trust recognises that the development of infrastructure is critical to meet the needs of the growing population, we ask that it is done with due consideration of the natural environment. The Trust is concerned that the Commission's current approach is to consider hard infrastructure needs in isolation from the natural environment. This is reflected by the questions within this consultation. None of them make any reference to the wider environment, whereas the Trust believes the natural environment – both its protection and enhancing its ability to deliver vital ecosystem services to society - should be a starting point for all decisions on the infrastructure provision. This is essential to delivering the current government's manifesto commitment that 'we will build infrastructure in an environmentally sensitive way'

The Natural Environment White Paper (NEWP) published in 2011 must be at the heart of all infrastructure decisions. It outlines the Government's vision for the natural environment over the next 50 years and informs key areas of policy development in relation to conservation and biodiversity. This includes a Government commitment to "providing appropriate protection to ancient woodlands." In addition the NEWP confirms that "Departments will be open about the steps they are taking to address biodiversity and the needs of the natural environment, including actions to promote, conserve and enhance biodiversity."

The NEWP also says "We will move progressively from net biodiversity loss to net gain, by supporting healthy, well functioning ecosystems and establishing more coherent ecological networks."

The evidence on which the Government has based these key policies in the Natural Environment White Paper is found in the Lawton Review. This recognises the importance of habitat networks, and reducing fragmentation of habitats. The review also stated that the government must "provide greater protection to other priority habitats and features that form part of ecological networks, particularly Local Wildlife Sites, ancient woodland and other priority BAP habitats".

Careful ecological assessments and planning at an early stage can minimise damage and ensure that needed infrastructure and mitigation works are as effective as possible in enhancing biodiversity and public access.

The Trust seeks assurances that the Commission is taking these considerations into account at the earliest possible stage.

4. What are the key international connectivity needs likely to be in the next 20-30 years in the north of England (with a focus on ports and airports)? What is the most effective way to meet these needs, and what constraints on delivery are anticipated?

No Comment.

5. What form of governance would most effectively deliver transformative infrastructure in the north, how should this be funded and by whom, including appropriate local contributions?

To be truly transformative infrastructure must deliver green infrastructure integrated with grey infrastructure. It is critical that green infrastructure is considered beyond simply delivering screening

but to consider the wide range of ecosystem services it can deliver - from reducing flood risk, improving biodiversity and providing valuable green space for local residents. Large infrastructure projects are an opportunity to view local green infrastructure needs strategically as part of wider development needs.

It is vital that the means of securing these new sites is embedded in a legal framework. Options for this include voluntary but nonetheless legally and financially binding "Conservation Covenants", which have recently been the subject of a consultation by the Law Commission. These covenants can be undertaken between local authorities and private landowners, with a term of either perpetuity or a duration agreed between partners. For newly planted woodland to become established, develop a canopy and go through its first cycle of management, a minimum term of 50 years would be required. The recent A21 widening is a key example. The lack of a covenant has seen ancient woodland translocation works occur at the wrong time of year, with some translocation not occurring due to unexpected complications. The whole offsetting schemes was problematic with no financial commitment to mitigation, compensation or monitoring measures after the initial capital-funded 5 year period mentioned in the scheme proposals.

London's transport infrastructure

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

The London commuter hinterland is predominantly designated as green belt. The green belt offers an exciting opportunity for environmental enhancements on the doorsteps of vast swathes of London's population. The green belt is coming under increasing development pressure, but the Trust would like to see its unique position close to both town and country capitalised on to make critical biodiversity links for wildlife as well as providing vital easily accessible greenspace for urban residents. In early discussions about the green belt, such as in an article by David Niven in 1910, emphasis was placed on the green belt being part of a park system with a focus on public access. With increased development occurring in the greenbelt it is critical that the remaining green belt is enhanced and the ecosystems services it provides capitalised upon. In 1914 in a speech to the London Society Aston Webb (architect of the Victoria and Albert Museum) said in his vision of London in 100 years time he saw 'a beautiful sylvan line practically all around London' with a certain amount of open spaces, pleasure grounds'. This is an opportunity to fulfil that vision and to create infrastructure and communities that are robust and resilient in the face of growing populations and climate change.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

- *How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?*

- *What might their potential impact be on employment, productivity and housing supply in London and the southeast?*

No Comment.

3. *What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?*

No Comment.

4. *What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?*

- *What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?*

- *What innovative funding mechanisms could be considered to support delivery of key schemes?*

No Comment.

5. *How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?*

No Comment.

Electricity interconnection and storage

1. *What changes may need to be made to the electricity market to ensure that supply and demand are balanced, whilst minimising cost to consumers, over the long-term?*

- *What role can changes to the market framework play to incentivise this outcome:*

- *Is there a need for an independent system operator (SO)? How could the incentives faced by the SO be set to minimise long-run balancing costs?*

- *Is there a need to further reform the “balancing market” and which market participants are responsible for imbalances?*

- *To what extent can demand-side management measures and embedded generation be used to increase the flexibility of the electricity system?*

No Comment.

2. *What are the barriers to the deployment of energy storage capacity?*

- *Are there specific market failures/barriers that prevent investment in energy storage that are not faced by other ‘balancing’ technologies? How might these be overcome?*

- *What is the most appropriate scale for future energy storage technologies in the UK? (i.e. transmission network scale, the distributed network or the domestic scale.)*

No Comment.

It is important that as the Commission consider electricity interconnection and storage, due consideration is given to future impacts on the natural environment. Ensuring that the delivery of all future provision takes in to account and works in harmony with our existing green infrastructure is vitally important.

The Woodland Trust has witnessed significant losses of irreplaceable ancient woods and trees across much of England due to the lack of consideration for impact on the natural environment. While new storage technologies and interconnection is something we do not object to, this must not come at the expense of irreplaceable habitats.

The Trust would also emphasise its support for the prioritisation of renewable sources and technologies in electricity provision.

3. What level of electricity interconnection is likely to be in the best interests of consumers?

•Is there a case for building interconnection out to a greater capacity or more rapidly than the current 'cap and floor' regime would allow beyond 2020? If so, why do you think the current arrangements are not sufficient to incentivise this investment?

•Are there specific market failures/barriers that prevent investment in electricity interconnection that are not faced by other 'balancing' technologies? How might these be overcome?

No Comment.

4. What can the UK learn from international best practice in terms of dealing with changes in energy technology when planning to balance supply and demand?

No Comment.

National Infrastructure Commission Call for Evidence

Submission from London Chamber of Commerce and Industry

8th January 2016

Introduction

London Chamber of Commerce and Industry (LCCI) has been a voice of London business for over 130 years. We are the largest capital-focused business advocacy organisation, representing the interests of over 3,000 companies from small and medium-sized enterprises through to large, multi-national corporates. Our member companies operate within a wide range of sectors across all 33 London local authority areas – genuinely reflecting the broad spectrum of London business opinion.

As the voice of London business we seek to promote and enhance the interests of the capital's business community through representations to the Mayor and the GLA, central Government, Parliament and the media, as well as relevant international audiences. Through member surveys and commissioning research, LCCI seeks to inform and shape the debate on key business issues.

This submission focusses on the National Infrastructure Commission's second challenge – large-scale transport infrastructure improvements in London, as outlined in its terms of reference.

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

LCCI believes that London faces two significant challenges. The first is the acute undersupply of housing in the capital. The second is the need for sustained investment in London's transport system, in order to service London's rapidly increasing population.¹

Research undertaken by ComRes on behalf of LCCI in May 2015 found that housing was the top infrastructure priority for London.² It is, consequently, essential that the role of investment in London's transport infrastructure to help address London's chronic undersupply of housing is recognised.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

LCCI strongly supports the development and construction of Crossrail 2. It represents a strategic investment in London's future infrastructure needs. The successful delivery of Crossrail 2 would help address the two pressing issues; London's housing crisis and transport 'capacity crunch' which are both impacted by the capital's increasing population and levels of employment.

¹ It is expected that the population will grow to 10 million by 2030 (<https://tfl.gov.uk/info-for/media/press-releases/2015/june/-tfl-annual-report-published>)

² ComRes survey of 1,016 members of the London public, 156 London councilors and 510 London business decision makers for London Tomorrow *London's future infrastructure: Who pays and how do we deliver?* May 2015

By improving transport connectivity across the capital, Crossrail 2 has the potential to unlock the development of tens of thousands of new homes, particularly in the Upper Lee Valley and even the Stanstead Corridor, and LCCI believes that the project should be viewed as an essential component of overall efforts to reach housing targets.

Concurrently, with the rapid increase in London's population (expected to reach 9 million by 2020 and 10 million by 2030) it is also essential that London increases its overall transport capacity to accommodate the increase in the number of commuters into and through the capital.

LCCI recognises, however, that there are other, smaller scale infrastructure projects in London that need to be taken forward. The wider South East of London is experiencing rapid population growth and the regeneration of East London has seen increased investment by the business community. However, road connectivity in the area is poor, especially in comparison to West London. Within the M25 there are 23 fixed road crossings across the River Thames west of Tower Bridge (not including Tower Bridge itself)³ but just two to the east.⁴ This is detrimental for businesses in East London who are disadvantaged in comparison to their competitors on the other side of the capital. Whilst LCCI supports the current proposals for the Silvertown Tunnel, we believe that new, fixed river crossings should also be constructed at Gallions Reach and Belvedere.

Finally, tube upgrades are especially needed on the Piccadilly and Bakerloo lines, together carrying over 800,000 passengers a day, where rolling stock is over 40 years old. 42% of London business decision makers see Bakerloo and Piccadilly line upgrades as very important.⁵

- **How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?**

Crossrail 2 has the potential to deliver new rail capacity and also maximise London's potential for business and residential development. Any infrastructure project needs to tackle these two interrelated issues in order that London can remain competitive and productive as its population grows.

LCCI believes that Crossrail 2 is vital to London's future. However, new river crossings in the East and improvements to existing infrastructure are also hugely important and will need to be delivered.

- **What might their potential impact be on employment, productivity and housing supply in London and the southeast?**

³ East of Tower Bridge but east of M25 crossing of River Thames at Egham, there are the following fixed road crossings of the River Thames: A308 (at Staines), M3 (at Chertsey), B375 (at Chertsey), A244 (at Walton), A309 (at Hampton Court), A308 (at Kingston), A505 (at Richmond), A316 (at Richmond), South Circular Road (at Kew), A316 (at Mortlake), A306 (at Hammersmith), A219 (at Putney), A217 (at Wandsworth), A3220 (at Battersea), A3031 (Albert Bridge), A3216 (Chelsea Bridge), A202 (Vauxhall Bridge), A3203 (Lambeth Bridge), A302 (Westminster Bridge), A301 (Waterloo Bridge), A201 (Blackfriars Bridge), A300 (Southwark Bridge) and A3 (London Bridge).

⁴ West of Tower Bridge but east of Queen Elizabeth II Bridge/M25 crossing of River Thames at Dartford, there are the following fixed road crossings of the River Thames: A101 (Rotherhithe Tunnel), A102 (Blackwall Tunnel). In addition to the above fixed road crossings, there is also the Woolwich Ferry.

⁵ ComRes interviewed 506 London business decision makers between 19th May and 11th June 2014

Crossrail 2 is a transport project that can help unlock London's housing potential. It has the potential to enable and accelerate the development of 200,000 new homes across the region.⁶ The project would deliver jobs to the area by releasing and adding to capacity on longer distance main lines. It can also improve productivity by bringing a greater number of individuals' journey times below 45 minutes.

The population in London will continue to grow, regardless of whether Crossrail 2 is built. This is why it is essential for the issues of transport congestion and housing undersupply to be addressed now. Slow, congested commutes affect productivity and make it harder for businesses to recruit and retain staff. This is why both new homes, but also increased transport capacity across the London network, are required.

New river crossing to the east would also be particularly beneficial for the business community, especially the freight industry and those businesses who rely heavily on freight deliveries for their operation.⁷

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Highlighting the link between Crossrail 2's benefit as a means to deliver more homes, as well as increased transport capacity, is important. Publicising the project as a piece of vital housing infrastructure can help ensure that routes and station plans are developed mindful of the potential for land development, whether that be for office or residential use.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

The economic benefits of Crossrail 2 reach far beyond London and the South East alone. It is a vital piece of national infrastructure that will benefit the UK as a whole. For example, central government will benefit from Crossrail 2 through the increased tax receipts that will result from the economic growth it generates and the new homes built. Contributing to the project is therefore a good investment from the Exchequer's perspective.

Given the direct benefits to London, including its business community, the project will undoubtedly require contributions from the businesses and communities in London that stand to benefit. We would look towards Crossrail as an example which could be followed and consideration should be given to a Business Rate Supplement.

Beyond this we believe devolution has a role to play in helping deliver Crossrail 2. Increasing the proportion of the tax revenue generated by London that is retained by the capital would help allow it to pay for its own infrastructure needs. Moreover, further devolution might be tied to specific infrastructure projects such as Crossrail 2, whereby some of the value created by the project (e.g. increased stamp duty receipts from homes built in unlocked developments) helps pay for the initial investment.

- **What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?**

⁶ Crossrail 2: regional and national benefits September 2015

⁷ Around 90% of goods are moved around London by road (<https://tfl.gov.uk/info-for/media/news-articles/road-modernisation-reaches-half-way-point>)

As suggested above, the NIC should look at those who will benefit from the scheme in order to decide from where the financing should come. Given the relative lack of fiscal autonomy in London, the NIC should evaluate the benefits of creating a funding mechanism tied to devolved revenue streams such as business rates and stamp duty in order to allow the capital to fund its own infrastructure projects.

- **What innovative funding mechanisms could be considered to support delivery of key schemes?**

As highlighted previously, stamp duty could be devolved to London and linked to specific infrastructure projects in order that funding can be drawn from those who will most directly benefit from the investment in the longer term.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

Cities such as New York and Hong Kong retain a significantly higher proportion of the revenue they raise than London. Currently the Mayor of London retains just 7% of tax raised in the city. In New York the figure is 50%, in Tokyo it is 70%. Consequently, they are able to look strategically at their own, unique infrastructure needs and address them accordingly.

London does not need to reach these levels - but it does need a greater level of tax retention and greater autonomy to tackle the challenges it faces.

For further information please contact:

[contact redacted]

► National Infrastructure Commission

► Call for evidence: London's transport infrastructure

London Councils represents London's 32 borough councils and the City of London. It is a cross-party organisation that works on behalf of all of its member authorities regardless of political persuasion.

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

London's population alone is forecast to increase to 10 million people by 2030 with significant population growth expected in the wider south east of England as well. This provides a major opportunity for national growth, job creation and GVA but has a consequence for all London's infrastructure, including its transport system. In recent polling commissioned by London Councils, Londoners named housing, health and schools as their top three infrastructure priorities, as well as strong support for investment in the 'unseen' infrastructure that is vital to the city's functioning – waste, energy, digital and flood defences.

London Councils' polling indicates that 88% of Londoners believe there is a housing crisis. Unprompted, 54% give housing as the most important issue facing London. Major house building is needed, and these homes need good transport links otherwise they become unconnected deserts where people are forced to rely on car ownership. This is not something London wants to promote.

Positive contributions to these challenges could include a shift to a circular economy and investment in digital infrastructure to enable more people to work from home or use internet-based conferencing facilities, reducing usage of the transport system in peak periods. However, relying on digital infrastructure alone will not meet London's growth challenges and so significant investment in transport infrastructure is required. London government and central government need to tackle these challenges boldly, and not tinker at the edges; London's transport system is already at capacity, which can only worsen with increased population and employment growth.

London's economy relies on a mix of professions and workers at different income points. Without the right mix of homes across London to accommodate them, London's transport infrastructure will come under increasing pressure as lower-paid workers have to commute longer distances to centres of employment. This is why councils need the right local planning tools and flexibilities to ensure the right mix of tenures for their areas. Therefore the government should look again at policies such as Permitted Development Rights and Starter Homes which have the potential to undermine this local discretion, with consequences for housing mix and infrastructure.

London needs to get a good balance between land for employment and housing. Land for employment is coming under increasing pressure in the capital because of rising rents in some parts, the Permitted Development Rights policy and viability issues. Developments around infrastructure should incorporate mixed uses, whenever appropriate, and ensure that any businesses displaced by large infrastructure are appropriately relocated. Population growth needs to be matched by significant local growth in employment; otherwise most new job opportunities will be concentrated in central London and create even greater pressure on already constrained radial transport routes. Job creation in metropolitan centres in outer London can help reduce the need for radial trips to central London.

Housing Zones – which we have welcomed – are a good demonstration of how a locally-led and multi-agency approach can ensure the right infrastructure to unlock new housing supply. The Southall Housing Zone is a good example of a partnership between City Hall and the borough and other agencies to deliver a coordinated approach to housing and infrastructure.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London – on road, rail and underground – including, but not limited to, Crossrail 2?

- **How should they be prioritised, taking account of their response to London’s strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?**
- **What might their potential impact be on employment, productivity and housing supply in London and the southeast?**

London Councils believe that there are a number of strategic transport infrastructure schemes that London needs, but Crossrail 2 is the most significant and strategic of these.

Crossrail 2

Crossrail 2 is desperately needed to address severe capacity constraints that will exist on the London Underground and mainline Network Rail services such as those into London Waterloo, London Liverpool Street and London Victoria. When High Speed 2 is complete, Crossrail 2 is needed to provide capacity to allow those passengers to transit easily through London Euston. Crossrail 2 will support significant numbers of jobs along the line and provides general regional connectivity, which at present is only offered by the Thameslink line. Crossrail will improve this but more rail lines which negate the need to use the tube will have wider benefits for the rail and tube network in London as a whole. Crossrail 2 presents an opportunity to unlock sites for a significant number of homes that London desperately needs, and this should be taken into consideration in funding the scheme. There are also strong calls for an extension to east London to bring regeneration benefits to the London Riverside and Thames Gateway area.

Improve orbital routes in outer London and provide new rail connections

At present rail and road infrastructure is focused on getting people in and out of central London. In the outer London boroughs, a reasonable proportion of residents commute to work in another outer borough. Town centres in outer London such as Kingston, Sutton, Croydon, Bromley could benefit from improved orbital rail, bus and tram links between these areas, which would improve the current situation of people having to travel into central London to change and then travel out again, as well as reducing congestion. The Tramlink in south London has demonstrated the opportunity to build this capacity as have orbital ‘express’ bus services such as the X26 service which links Croydon and Sutton with Heathrow Airport. As well as the connectivity benefits, these services are often more affordable and easier to introduce than equivalent journeys by rail or tube. In areas of major regeneration and growth opportunity, key transport links such as the A13 trunk road need to be invested in to support this growth.

Brighton Mainline Upgrade

The Brighton Mainline which connects Brighton with central London via East Croydon and Clapham Junction is already severely overcrowded with passenger growth increasing at 4 per cent each year. As well as providing a commuter route, the line serves Gatwick Airport, and carries the Thameslink Service to London Bridge for onward travel to Blackfriars, St Pancras International and various destinations north of London. The last remaining serious bottleneck on the Brighton Mainline is caused by track arrangements at East Croydon station and north to the Windmill Bridge Junction due to the number of points and crossovers. This leads to trains frequently having to wait whilst another crosses its path, and other delays. Network Rail has carried out an Area Route Study and identified the urgent need to straighten the tracks, remove all crossovers and provide additional track through East Croydon station and north of it, and to grade separate the rail lines to London Victoria and those to London Bridge at the Windmill Bridge Junction. Network Rail is convinced of the need to deliver the improvements in Control

Period 6 (2019-2024), together with a rebuilt station at East Croydon that meets Croydon's modern needs. East Croydon is the fifth busiest interchange in the country and one of the busiest in terms of passenger entries and exits. Network Rail's proposals include two additional platforms and a greatly extended passenger concourse at the station to seek to cater for passenger demand / numbers. Croydon Council considers the improvements at East Croydon and up to and through Windmill Bridge Junction, vital to the achieving the growth potential of the Croydon Opportunity Area and meeting the growth needs of London and the South East.

Upgrade and extension of the Bakerloo line

This will support growth in southeast London and improve access to public transport, reducing car usage and associated emissions and congestion. The extension will support regeneration and development schemes, improve journey times and provide better connections, improving capacity.

East London River Crossings

We strongly support the feasibility work TfL is undertaking to explore river crossings in the east of London. More crossings in this part of London are much needed and would significantly improve connections between areas to the north and south of the river, supporting jobs and business growth. Whilst road crossings are important to improve the resilience of the south east London road network, we believe they must incorporate safe and viable walking and cycling crossing options. Bus routes should also be scheduled to use the crossings and we support TfL in exploring the inclusion of public transport options such as trams or the DLR.

An improved bus network

In recent polling commissioned by London Councils, more frequent buses were the top improvement Londoners wanted to see; selected by 48% of those surveyed. This rose to 63% amongst people with lower incomes. Boroughs want to see a more responsive bus network, with new routes created to serve new housing developments and employment sites, where public transport options can at present be limited. Good public transport links improve the desirability of a new development and reduce car ownership if people know they will be able to get around, as well as contributing to improved air quality. The creation of bus lanes is important in improving the reliability of public transport. Bus services that link outer boroughs with central London to reduce the cost of travel for low-paid Londoners was also something that our recent research into transport affordability *Living on the Edge* uncovered.¹

Improvements to cycling and walking infrastructure

Notwithstanding the recent developments on a national walking and cycling investment strategy, it remains important in London to continue to provide the hard cycling and walking infrastructure that makes using these modes safer in London, as this is so often cited as a barrier. The recent mini-Holland schemes should be tested for success and could be rolled out to other parts of London.

Electrification of vehicles

Increasing the uptake of electric vehicles in commercial fleets and household vehicles is predicated on having sufficient charging infrastructure to give people the confidence to switch to a hybrid or fully electric vehicle. As well as citywide charging infrastructure, there must also be sufficient electricity capacity to charge these vehicles.

We believe that schemes should be prioritised that will unlock housing numbers and growth in jobs and businesses. Transport schemes are not ends in themselves, but are a vital part of the wider infrastructure the city needs to provide for its residents and businesses. Public realm can also contribute to the success of infrastructure projects, and opportunities to regenerate local areas, where appropriate, should be part of schemes. It is important to remember that schemes such as the Jubilee line have unlocked areas of London for growth and regeneration. Schemes such as these, that are ambitious for London, should continue to be considered.

¹ <http://www.londoncouncils.gov.uk/our-key-themes/transport/rail-and-tube>

We have outlined above the strategic infrastructure that London needs to support its growth. It is also important that the non-glamorous infrastructure needs, such as well-maintained roads and good signposting and public safety to encourage people to walk more, are also important to keep London moving. Improving step-free access onto transport must also continue to be a priority.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

TfL has already undertaken a lot of work to increase the benefits, not least by opting for the 'regional' route rather than the 'metro' route and by working with boroughs and local authorities along the route to develop plans for housing and regeneration. The regional route brings greater benefits to London as a whole and to outside London than the metro route. The balance has to be struck between providing a fast, reliable journey time, and increasing connectivity for a large number of communities along the line.

London Councils also believes that the traditional cost: benefit ratio using the WebTag business case methodology fails to fully capture the wider economic benefits that transport infrastructure can create in unlocking development sites. We want to see the government take Gross Value Added into account in its assessment of the value of new schemes.

The only options we consider that can reduce the overall cost are to:

- Shorten the route, which would reduce the benefits analysis;
- Reduce the number of stations the railway calls at, reducing connectivity, house building potential and benefits to residents and businesses at that location. For Crossrail 2, all but one of the proposed stations in the tunnelled section are interchanges with other lines, and relieving capacity on other lines is one of the main purposes of Crossrail 2.
- Phase the construction of the railway over a much longer time period, which could mean a lengthy construction project with a great deal of uncertainty and extensive disruption to residents and businesses. Phasing the project also risks not delivering the capacity benefits that London needs at the time when it needs them most (for example missing the opening of High Speed 2 at London Euston and the significant capacity constraints that will create without Crossrail 2).

Whilst we support efforts to reduce costs, we would need to understand the consequences of any of the options listed above more fully before we could support them.

Crossrail 2 needs to be viewed in the context of the significant housing benefits it offers, which should be maximised and are absolutely essential for London to prosper in the future. The links between London prospering and benefits to the rest of the country have been well documented. Stronger transport links can make a site more attractive to developers, increasing the number of housing units supplied. Unlocking sites for development in this way helps people to get to work more quickly and increases the attractiveness of an area for workers.

It will also be important to consider fully the interdependences between Crossrail 2 and other infrastructure that will ensure the benefits of Crossrail 2 are fully realised. Other infrastructure enhancements will improve the areas stations serve; free up physical space for the construction work to take place; and ensure that additional capacity provided by Crossrail 2 is not lost by bottlenecks on another piece of transport infrastructure such as the tube or rail network.

We also note that there are no real alternatives for London Waterloo without Crossrail 2. Even were the South West Mainline six-tracked, without Crossrail 2 the constraints would remain. One alternative is a fifth track all the way into Waterloo, although we understand that Network Rail considers this difficult and expensive. At the northern end of the Crossrail 2 route, four-tracking of the West Anglia line from Cambridge into the Lea Valley could potentially allow more trains into Stratford, though not on to London Liverpool Street. These upgrades would not support the full growth potential of the Upper Lea Valley.

At London Euston, costs could be reduced by planning for the comprehensive redevelopment of Euston station to incorporate the existing mainline station, the High Speed 2 station, and the Euston St Pancras Crossrail 2 station. By bringing forward the redevelopment of the mainline station, the costs of purchasing residential and commercial property, providing compensation, and the impact on those affected can be reduced; worksites could be shared; and a better station experience created.

4. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

- **What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?**
- **What innovative funding mechanisms could be considered to support delivery of key schemes?**

When polled, 79% of Londoners said central government should fund infrastructure, rising to 83% of 35-54 year olds and those with lower incomes.

Nevertheless, London boroughs support the proposals for London as a city to contribute half of the cost of Crossrail 2. As the beneficiaries will be residents and workers, it is appropriate that there are contributions from both. We continue to support a pan-London funding package, as exists for Crossrail.

London boroughs support the continuation of the Business Rates Supplement at 2 per cent for businesses with a rateable value of over £55,000, whilst acknowledging that this is a blunt instrument and can lead to discrepancies between businesses that pay and business that benefit. We consider there is scope for considering how businesses around Crossrail 2 stations could contribute where they would not be eligible to pay a Business Rates Supplement, striking a balance to protect small businesses. There is also broad support for the continuation of the Olympic council tax precept at its current level to fund infrastructure, although clearly this was not its long-term intended purpose.

London Councils has considered international examples of funding infrastructure but at present there is not the interest from London boroughs to pursue these further. Some central London boroughs have explored a visitor levy or hotel tax, but consider it more appropriate to raise this to fund services that directly improve the borough for tourists – such as street cleansing and public realm improvements.

We strongly believe that residents and businesses outside London who will receive the benefits of Crossrail 2 must also contribute in the same ways that London's residents and businesses are contributing – through a Council Tax precept and Business Rates Supplement. The Mayor does not have any authority outside London, but we would hope that the counties of Hertfordshire and Surrey could come voluntarily to an agreement with London to establish such funding mechanisms. This has been achieved before with the funding of the Lee Valley Regional Park.

We also note that TfL is exploring the contribution stamp duty from the sale of new homes and increased prices on the sale of existing homes could make to Crossrail 2. We believe this should be further investigated for its merit in funding Crossrail 2.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

PwC's Funding and Financing Study explores in depth international models for funding infrastructure, which we have considered for their applicability to London.

Toronto, Canada, is responding to its city congestion problems with a two-stage investment in its transport system, focusing on bringing economic growth and job creation. It will build, extend and upgrade a series of light rail, underground and bus routes over a 25 year period.

Paris is establishing an equivalent authority to the Greater London Authority to improve its city transport connectivity with its suburbs. It is building a Grand Paris Express to link the centre of Paris with its airports and major economic areas in the greater Paris region.

Nottingham City Council has introduced a workplace parking levy on its employers which want to provide parking, to tackle traffic congestion, fund extensions to the tram system and fund their local bus network.

London Cycling Campaign is the capital's leading cycling organisation with more than 12,000 members and 40,000 supporters. We welcome the opportunity to submit comments to the National Infrastructure Commission. While the comments below relate to London most have relevance for the rest of the United Kingdom.

3.1

In line with the published terms of reference, the Commission is reviewing the evidence base and the strategic options for future investment in large-scale transport infrastructure improvements in London.

The questions that the Commission is particularly keen to focus on in this initial phase of work are:

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

London's population is growing and expected to exceed 10m. Motor traffic congestion is already a problem in the capital and it will get worse if car ownership and use increases. Public transport also suffers from capacity problems. Maintaining, and increasing, the pace of cycling growth is vital to keep London moving.

London's Mayor has a target in the TfL business plan of doubling cycling's modal share to 1.5 million journeys by 2026 (a 5% share at current population levels). If this target is not achieved there will be the much more costly challenge of getting London's increased population to its various destinations by other means. Cycling infrastructure is significantly less expensive than new road, rail or underground tunnels (and can be minimal if incorporated into road modernisation programmes) yet it offers very efficient use of road space: the newly built East-West cycle superhighway will have the capacity for 1000 cyclists per hour each way – the equivalent of four underground trains.

The number of daily cycling journeys in London already exceeds the total number of journeys on the Docklands Light Railway, London Overground and Tramlink put together. Surveys carried out for TfL indicate that a quarter or more of Londoners would like to cycle or cycle more often. The aspirational target set by TfL and the Mayor of 10% of journeys is achievable and is still well below the existing rates in Amsterdam (36%) and Copenhagen (45%). According to TfL data, in Central London at peak times cycles already account for a quarter of vehicles on the road.

In the context of this inquiry it is worth noting that in the Netherlands 40% of journeys to stations are made by bicycle. This is facilitated by ample cycle parking at stations as well as safe cycling routes to those stations. In the UK cycling accounts for 2% of journeys to stations but that can rise rapidly (e.g. Cambridge) if facilities are provided (a new 3000 space cycle park is being constructed) .

No major road or rail infrastructure programme must be allowed to proceed without consideration of cycle access and parking: Parliamentary approval of the outline plans for St Pancras rail terminus without any requirement for cycle parking or access resulted in a significant barrier to integrated transport use at this flagship location which the local authority was unable to undo.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

- **How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?**
- **What might their potential impact be on employment, productivity and housing supply in London and the southeast?**

Sustainability, improved air quality, improved health and efficiency and a better quality of life for Londoners must determine the transport priorities for London. Increased cycling levels address all of these issues and the well documented examples from the Netherlands and Denmark show how cycling can become the primary transport mode in a dense urban environment (see below for data) .

Prioritisation of walking , cycling and public transport enables cities to build more homes and allocate less scarce space to car parks and street car parking. A recent report (Minor Alterations to the London Plan) on the proposed minor increase in car parking levels in outer London shows that even this minor change may cost 260 fewer homes for Londoners each year.

Provision of high grade cycle facilities across the capital, and particularly in its major town centres, would enable more people to travel to work , education and leisure destinations more quickly and with health benefits to themselves.

Designing all transport interchanges to permit multi-modal transport can extend the 'active travel' catchment areas of stations fourfold reducing the need for car travel to stations and car parking at stations.

Dutch, and British, academic studies show that cyclists live longer, have higher fitness levels and show lower levels of absenteeism than people who have to choose other travel modes.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

LCC submitted the following comments to the preliminary Crossrail 2 consultation

The following are our general concerns regarding the potential benefits to and impacts on cycling, arising from Crossrail 2.

1. Crossrail 2 rolling stock design should ensure maximum possible capacity for cycling carriage. Many of the stations proposed are in areas with attractive leisure cycling potential, and a higher proportion of cycle carriage spaces would enable cyclists to more easily travel to and from central London outside of peak hours with their bicycles, access Crossrail 2 stations for leisure purposes and travel through London using Crossrail 2.
2. In Holland, around 40 percent of train passengers use bicycles to get to and from their local "home" train station. TfL has an opportunity to easily increase cycling

modal share in London, by ensuring Crossrail 2 stations feature exemplary, international levels and quality of cycle parking – built to anticipate future demand, rather than service current demand.

3. In a similar vein, it's also vital local councils involved and TfL give appropriate consideration to safe space for cycling on routes from surrounding residential areas and other suitable locations to access each station. In central London, the project offers significant opportunities to improve nearby main roads and routes lacking in appropriate cycling infrastructure.
4. Finally, such a large construction project will carry its own issues – in terms of HGV/lorry movements, construction sites and temporary site works. It's obviously important that everything that can be done to mitigate disruption and increased risks to cyclists from such issues is considered. We call on TfL to specify “direct vision” lorries for all Crossrail 2 construction (as well as ensuring operators are CLOCS compliant etc.), and to work with London Cycling Campaign and relevant local borough groups on a regular basis to ensure safety is maximised and disruption is minimised throughout the construction period.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

- **What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?**
- **What innovative funding mechanisms could be considered to support delivery of key schemes?**

In Dutch and Danish road schemes provision for cycling is integrated into projects from the start rather than tagged on as an, often expensive and disruptive, after measure. They also consistently adhere to well established and progressive cycle infrastructure design standards (the Dutch CROW Design Manual for Bicycle Traffic and the Danish Collection of Cycling Concepts are both translated into English) . London has recently published cycling design standards (London Cycle Design Standards and the accompanying Cycling Level of Service assessment) which include continental good practice, but these are not yet used consistently. The current UK cycle design standards lag behind the London ones and even they are not followed.

The Dutch and the Danes ensure that cycling measures are well funded, or incorporated into road modernisation, because they recognise that this investment saves costs on other infrastructure work, such as new roads or rail, which is significantly more expensive. This was recognised by the Eddington report on infrastructure for the UK Government which said that “Improving the attractiveness of walking and cycling, e.g. by creating or upgrading routes, can provide strong returns with wider BCRs sometimes over 10.” It also noted that “Well targeted smaller-scale walking and cycling schemes also have a beneficial impact on the environment due to the mode shift from car to these non-polluting modes.

The Dutch permit the use of car parking income to fund increased cycle parking provision.

As noted above, cycling infrastructure often does not need extra funding; rather, application of the road user hierarchy, TfL's Cycling Level of Service and London Cycle Design Standards to all traffic schemes, would enable cycling infrastructure to be realised as part of existing multi-billion pound road modernisation programmes.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

Cities in the Netherlands and Denmark are world leaders in the promotion and delivery of high levels of active and sustainable travel modes. This has the obvious benefits in terms of population health and air quality as well as reducing motor traffic congestion. Despite enjoying levels of cycling far higher than those in the UK continental cities continue to work towards growth in cycling.

In central Amsterdam the modal share of cycling is 50% while in the city as a whole cycling's modal share of journeys is more than a third. In Copenhagen the current modal share of cycling is 45% with an aspiration to exceed 50%.

Other cities with aspirations to be world leaders in terms of 'liveability' and sustainability are seeking to boost cycling use and improve their cycling infrastructure. New York, Paris, Seville, Barcelona, Bogota, Portland and others are all investing in their cycle infrastructure and reaping the benefits.



8 January 2016

Title of consultation

National Infrastructure Commission – call for evidence

Organisation

National Infrastructure Commission

Introduction

The London Fire and Emergency Planning Authority (LFEPA) runs the London Fire Brigade (LFB). The 17 members of the Fire Authority are appointed by the Mayor of London. Eight are nominated from the London Assembly, seven are nominated from the London boroughs and two are Mayoral appointees. LFB is the busiest fire and rescue service in the country and one of the largest firefighting and rescue organisations in the world. We are here to make London a safer city and our vision is to be a world class fire and rescue service for London, Londoners and visitors. We will always respond to fires and other emergencies, but our work has changed over the years with a much stronger emphasis now on fire prevention and community safety.

Response

3. London's transport infrastructure

3.1) In line with the published terms of reference, the Commission is reviewing the evidence base and the strategic options for future investment in large-scale transport infrastructure improvements in London. The questions that the Commission is particularly keen to focus on in this initial phase of work are:

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

The changes that increasing population pressures will bring to housing, businesses and services may present challenges to the London Fire Brigade in protecting London and Londoners. This has already been demonstrated in the increased use of 'Sheds for Beds'. The increased use of non-standard or non fire compliant accommodation or business premises may bring social challenges including the increased risk of fire and the associated economic and social costs.

In addition, the challenging and ageing population demographic may create additional social and economic challenges in London. This includes a shift in the care landscape to an increase in vulnerable persons living independently in housing not designed to support their care needs.

The promise of 'night tube' and the changes that this may bring to the night time economy in London are broadly welcome. We anticipate that night tubes will evolve to include the DLR, Crossrail, and Crossrail 2 networks. The London Fire Brigade anticipate that this will significantly change the night time economy of London and our citizen's behaviour. This in turn may change the profile of risks that Londoners face and type and number of emergencies. This may impact across the spectrum of the services we provide with a potential mobilisation increase to London Underground premises due to the night use. Office hours will change too as improved transportation in and around London may enable 24/7 working practices.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

- How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?

The London Fire Brigade has played a full part in the design of major transport infrastructure projects in London including Channel Tunnel Rail Link, Woolwich Arsenal Extension, DLR car expansion, Crossrail and Crossrail 2 and Silvertown Road tunnel. Our work on reducing the impact of operational incidents on these networks and the London Underground system has produced positive results across the planning, construction, testing and commissioning phases. The engagement of the Fire and Rescue Service and adoption of lessons learnt from our experience should be considered a priority to reduce unnecessary costs arising from over-engineering the infrastructure. There have been instances where the lessons have not been learnt, particularly during the construction phase, which have impacted on time, cost and the capability of the emergency services to respond to incidents during the construction phase.

- What might their potential impact be on employment, productivity and housing supply in London and the southeast?

Supporting the delivery of a safe, resilient and secure mass transit system, on time and on budget will support the general social and economic vitality of London and the southeast.

With current and future demographic projections, there is a need to find at least 450,000 jobs for Londoners in the next ten years with another 400,000 homes too.

Large areas of London including the Upper Lea Valley and Battersea Nine Elms area have been earmarked as having the potential for both transport and residential redevelopment. This could help create communities, thousands of jobs and the improved transportation would give an added boost to already existing local businesses.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

We have been engaged with planning for Crossrail since the early 2000s. Unfortunately some of the benefits from lessons learnt were not recorded and agreed. Various changes to the project's management resulted in the learning being lost. To remedy the omission has resulted in increased cost and risk to the project. Methods of learning from previous projects could be improved. The introduction of a dedicated LFB seconded Officer to the project at an early stage could greatly benefit the project and reduce risks and therefore costs to both the scheme and emergency services.

Part of Crossrail 2 project's 'over site development' at stations and shafts could be used to provide GLA facilities (fire stations) and also further alleviate the housing issues faced by London by incorporating social housing within the footprint. This could allow older stations, with larger footprints, to be developed to partially fund the joint development. This would further assist change in the LFB, provide us direct access greater numbers of public for community safety matters.

- 5.3)** We may publish any submissions made; if you believe there is a reason why your submission or any part of your submission should be considered confidential please provide details.

The detail of the relationship between the LFB and Crossrail, and the detail relating to lessons learnt is commercially sensitive.

The Commission is subject to legal duties which may require the release of information under the Freedom of Information Act 2000 or any other applicable legislation or codes of practice governing access to information.

Rt Hon Andrew Adonis
Chair, National Infrastructure Commission
HM Treasury
1 Horse Guards Road
London SW1 2HQ

8th January 2016

Dear Andrew

National Infrastructure Commission call for evidence

I am writing to you to set out London First's views in response to the National Infrastructure Commission's call for evidence. We support the creation of the National Infrastructure Commission and welcome the fact that the need for large scale transport improvements in London has been identified as one of three key future challenges. As you would expect, our submission focuses on London's transport infrastructure.

As you know, London First is an independent business membership organisation whose mission is to make London the best city in the world in which to do business. Our members include the capital's leading employers in key sectors such as financial and business services, property, transport, ICT, education, creative industries, hospitality and retail.

We welcome the Government's commitment to investing in infrastructure as a driver of economic growth, and in particular its commitment in the recent spending review to support £11 billion of new investment in London's transport to the end of the decade. Such investment on its own is, however, insufficient to meet the scale of growth facing London – something tacitly recognised through the creation of your current study. Enabling London to meet its longer term growth potential will require continued investment into the 2020s if we are to avoid serious overcrowding on public transport, regular station closures and worsening road congestion.

We hope that the Commission will endorse the need for prompt and positive decisions on future investment in London's transport infrastructure, particularly in Crossrail 2. With the right investment decisions, we believe that London holds significant potential to support additional economic activity to the benefit of the UK as a whole.

We would of course welcome the opportunity to meet with you or your team to discuss these issues further.

Yours sincerely

David Leam
Infrastructure Director

National Infrastructure Commission call for evidence Representation from London First

We welcome the opportunity to provide a London business view on the pressing infrastructure challenges being examined by the Commission ahead of the March Budget. As a London-based organisation, our submission focuses on the challenges facing London's transport system. However, we make some opening comments on the importance of securing good transport connectivity in general, which apply both to London and to other UK cities also being considered by the Commission.

Infrastructure's role in supporting economic growth is now widely recognised. Analysis by the IMF has shown that "*in a sample of advanced economies, a 1 percentage point of GDP increase in investment spending increases the level of output by about 0.4 per cent in the same year and by 1.5 per cent four years after the increase*". (See [London's Infrastructure: Investing for Growth](#) for further details).

While we are not well placed to comment on the merits of specific proposals being considered across the north of England, we believe that if government is to address regional imbalances this will require intelligent interventions such as improvements to transport infrastructure around the UK. While it is by no means a dead cert, strengthening transport connectivity between northern cities could plausibly contribute towards creating a stronger agglomeration economy in the north.

At the same time we must not lose sight of the fact that in London and the SE, the UK is fortunate to have one of the most successful and productive agglomerations in Europe, even the world. Sustaining London's continued success generates the economic returns that support investment right across the UK. Given this, we must avoid falling into the trap of thinking that as a country we should somehow choose between investing in infrastructure in London or in cities elsewhere. If the UK is to secure sustainable economic growth we must do both.

We also welcome the creation of Transport for the North. The London model of a Mayor and city-wide transport authority has transformed the capital's ability to provide good day-to-day transport services and to plan and deliver new infrastructure and services that meet the needs of Londoners. Transport for the North has the potential for a similarly beneficial impact on cities across the north.

Finally, we believe that a key constraint facing all UK cities is their limited capacity to self-invest, given the much lower levels of fiscal and political autonomy UK cities have relative to their international counterparts. We say more on this issue below.

London's transport infrastructure

Taking the Commission's five questions in turn:

1. *What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?*

With the right decisions, London's economy has the potential to grow further and faster in support of UK productivity. London is a unique global hub for talent, business,

finance and global visitors. It is a very productive city, with Inner London having the highest GDP per capita in the EU, which also helps drive productivity elsewhere in the country as firms locate related business functions outside the capital. We recently supported the London Enterprise Panel in producing an economic development agenda for the capital ([London 2036: an agenda for jobs and growth](#)), which sets out how London is well placed to continue to grow in a changing global economy.

London's success is also of benefit to the UK at large. As a global business hub, London serves the country as the principal location for corporate headquarters. It is the UK's international gateway for talent, tourists, and investment. Construction and infrastructure spend on London projects directly benefit many parts of the rest of the country. London also makes a significant net contribution to the UK's overall tax revenues - £34 billion in 2013/14 alone.

London is projected by the GLA to grow to 10 million people by the early 2030s and to exceed 11 million by 2050. Employment is also predicted to rise significantly – from 4.9 million London based employees in 2011 to 5.8 million in 2036. Such projected growth is testimony to the capital's continued attractiveness as a world city. Yet as London grows, the transport infrastructure that enables the city to function comes under greater strain. A legacy of historic underinvestment over past decades compounds the problem.

If a growing London is to fulfil its economic potential for the UK as a whole and maintain its competitive advantage globally, it needs investment in its transport infrastructure, much of which is already operating at or near its limits. To ensure we can successfully mobilise a growing population into the most economically productive region in Europe, London needs a transport infrastructure plan beyond 2020, with agreed priorities and committed funding.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

Effective infrastructure delivery requires two things. First, London needs an agreed plan which identifies and prioritises future infrastructure need across sectors, focussed on driving enhanced productivity, competitiveness and economic growth. Targeting the programme in this way is essential as this generates the additional value and revenues which support sustained investment in London and the wider UK. Second, there needs to be the long-term funding and financing to pay for that infrastructure.

On the first of these points, the Mayor of London has taken a significant step forward in planning for growth with the recent publication of the GLA's London Infrastructure Plan 2050 and the creation of a new Infrastructure Delivery Board. The Plan identifies a range of transport priorities for London, including upgrades to existing tube, rail and road infrastructure, as well as additional new transport infrastructure.

We welcome the commitment in the recent spending review to support £11 billion of new investment in London's transport to the end of the decade. However, such investment on its own is insufficient to meet the scale of growth facing London. Enabling London to meet its longer term growth potential will require continued

investment into the 2020s across all transport modes if we are to avoid serious overcrowding on public transport, regular station closures and worsening road congestion.

This takes us to funding and financing. London has remarkably limited capacity to self-invest and is more dependent for funding on central government in key sectors such as transport. We therefore welcome the National Infrastructure Commission's review of London's transport infrastructure as we believe future planning by both central and London government needs to take place in earnest now.

Turning to London's roads first, the network faces significant capacity pressures. These will in part need to be addressed through improved traffic management systems and through making it easier for road users in the peak, such as freight, to operate at other times of day. However, new capacity will also be required, starting with the long overdue completion of proposed new river crossings to the east of London. For the longer term more radical and difficult options such as new underground roads and more sophisticated congestion charging also need to be explored.

On the Tube and rail we believe that there remains some scope for further upgrades to existing lines, through modernised signalling and new trains - which enable more capacity through higher frequencies, as well as greater reliability. Inevitably, however, the potential for greater benefits is much more limited on the numerous lines that have already been upgraded. We also see scope for further devolution to the Mayor of rail services within London as franchises expire, to enable services to be better integrated with the wider London transport network and better aligned to the needs of users.

The introduction of Crossrail and a revitalised Thameslink by the end of this decade will enhance London's rail capacity and provide some breathing space on some parts of the network. But London's rate of growth is such that new infrastructure will also be required if we are to successfully harness population growth into economic growth. We endorse the Mayor's argument that there are numerous potential transport schemes in the capital which would enable additional economic growth, jobs and housing – and believe Crossrail 2 should be an immediate priority for the 2020s.

As the former Chair of London First's [Crossrail 2 Task Force](#), you will know that London business is a strong supporter of Crossrail 2 as a regional transport scheme that will add significant new rail capacity, while supporting 200,000 new homes across London and the south east (and around 60,000 jobs across the UK during its construction). You will also be familiar with the report of our subsequent [funding group](#), chaired by Francis Salway, which described the case for building Crossrail 2 as "overwhelming". We believe that the arguments set out in these reports in favour of Crossrail 2 remain compelling, and urge the Commission to support Crossrail 2 as an early funding priority to enable its delivery over the 2020s.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

As with similar major projects at this stage of development, Crossrail 2 should continue to be subject to value engineering to bring down its cost. We also see

scope to further maximise the benefits of the scheme, in particular by better joining up new transport infrastructure and development than has often happened in the past.

We believe that future transport projects should be more ambitious early on about the scale of commercial and residential development that is both possible and appropriate around stations (our response to question 5 highlights experience in other cities). Chapter 3 of our Crossrail 2 funding report outlined the significant value uplifts occurring around Crossrail stations – only a small proportion of which were captured to help fund the project. We must now plan and deliver Crossrail 2 as an integrated transport and development project, not just a new railway.

We welcome the creation of the new Crossrail 2 Growth Commission to identify areas of potential development opportunity. Actually realising enhanced ambitions for residential and wider development will require sustained political leadership and in some places policy change, for example to planning policy regarding density and height, re-use of existing industrial land and, selectively, of green belt. It may also require the creation of bespoke special purpose vehicles to plan, lead and drive development on the ground. Ultimately, to realise additional development, politicians will need to will the means as well as the ends.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

For transport investment, the biggest challenge is funding: paying investment back over time. Transport for London (TfL) incurs most of the costs and the benefits are widely spread across society, although some are captured in increased tax take, largely by central government.

To help meet future investment needs, London will need to continue to utilise the various, albeit limited, revenue raising measures it already has discretion over (principally fares and charges, some taxes and developer contributions). For large-scale new projects such as Crossrail 2, Crossrail provides a good example of how a mixed funding approach can work, with funding flowing from national government (principally through grant), London government (principally through fares) and the private sector (through the business rate supplement and various forms of developer contribution).

Separately, the Northern Line Extension to Battersea is being funded by the private sector through CIL and the retention of business rates for a period. This income stream is supported by a government guarantee, with the project being delivered by TfL. Similarly, other UK cities have agreed 'City Deals' with HM Treasury whereby the proceeds of future growth are dedicated – alongside other forms of local contribution – to help fund infrastructure schemes that help stimulate additional economic activity.

Our Crossrail 2 [funding report](#) in 2014 identified a number of options which we believe show that a workable funding package can be negotiated to enable the project to go ahead. While some of the cost figures have risen since then, so too will potential value uplifts, so we remain optimistic that a viable funding package can be constructed and are willing to help work with central and London government and London businesses to develop a funding package as we did for Crossrail 1.

In the absence of substantial fiscal devolution, a funding package for Crossrail 2 will inevitably require additional support from government through some combination of grant, guarantees and retained tax revenues. This is perfectly reasonable given the much greater net benefits to the national economy that investment in London's transport infrastructure generates.

We believe that some form of greater devolution of tax revenues would increase the capacity of London government to raise revenues locally and accountably; it would increase the certainty as well as range of funding streams; and, perhaps most importantly, it would strengthen the financial incentives for London and local government to take what are often locally difficult decisions over housing and infrastructure investment as they would see a greater share of the rewards. Such an alignment of incentives has strong potential to support higher levels of economic growth in the capital than would otherwise take place.

The main focus of London business is, however, on achieving the outcome – sustained investment in London's infrastructure – to support economic growth. We are pragmatic about precisely how that is achieved.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

We have two main points. First, we would emphasise that Crossrail and Crossrail 2 are themselves good examples of London learning and applying the lessons of other world cities. Paris in particular has a long tradition of successfully planning and delivering regional rail links (in the form of the RER) – as London is now belatedly doing with Crossrail and Thameslink, and seeking to through Crossrail 2.

Second, we would highlight the experience of major metropolitan areas such as Hong Kong and Singapore which have been extremely effective in integrating transport infrastructure with high-density, high-value development. This has brought significant gains through creating additional opportunities for housing, employment and retail, and has also generated significant additional economic value – a proportion of which can potentially be captured to help fund transport infrastructure.

This is not to say that we should attempt to simply replicate those models in the UK as there are important differences in land use planning policy and how development is undertaken in practice. We should however draw on these models for inspiration and encouragement to apply existing policy tools, such as the CIL, towards similar ends here.

We believe that future transport projects should be more ambitious about the scale of commercial and residential development that is both possible and appropriate around stations. As noted above, realising this ambition may in places require changes to planning policy regarding density and height, re-use of existing industrial land and, selectively, of green belt. It may also require the creation of bespoke special purpose vehicles to plan, lead and drive development on the ground.

London Luton Airport Operations Limited (LLAOL) response to the National Infrastructure Commission's Call for Evidence

Introduction - The need for aviation capacity growth in the UK

1. This response is submitted on behalf of **London Luton Airport Operations Limited (LLAOL)**, the operator of London Luton Airport (LLA). LLA is the 5th largest and one of the fastest growing airports in the UK. In 2015 the airport handled a record 12.3 million passengers. The airport indirectly employs over 8,600 staff and is a key economic driver for the surrounding Three Counties region (Bedfordshire, Buckinghamshire and Hertfordshire), bringing in a total of £732 million in GDP locally in 2013.¹
2. **Aviation is a vital component of the UK economy.** The Airport Operators Association (AOA) has calculated that the sector contributes over £52 billion to the UK economy, supports a million jobs and pays almost £9 billion a year in taxes. The strategic importance of airports is set to rise even further with the demand for air travel to increase by 1-3% a year to 2050, with passenger numbers predicted to increase to 315 million in 2030 and 445 million by 2050¹.
3. **LLAOL supports the creation and aims of the National Infrastructure Commission (NIC).** Infrastructure investment is one of the most important drivers of economic growth in the UK and therefore LLAOL welcomes the Government's focus on this area. The creation of the NIC, coupled with further plans for infrastructure construction outlined in the Government's Infrastructure Bill 2015, are encouraging signs of the Government's commitment. However, LLAOL is disappointed that aviation infrastructure is not a specific concern of the Commission. As we have outlined above, aviation growth is essential to the prosperity of the UK economy. We acknowledge the NIC's argument that it does not want to revisit the work of the Airport Commission, but the expansion of Heathrow and Gatwick forms only a part of the country's airport capacity. We call on the NIC to revise its focus and consider the totality of the UK's aviation industry in its thinking.
4. **Furthermore, LLAOL believes that the NIC can be a vehicle for urban economic growth.** LLAOL shares the view of many in the aviation industry, that by improving London's transport infrastructure to better connect regions to London, the Capital can harness the benefits of these satellite areas for commercial and economic good. London's regional airports are great examples of these areas of wealth creation. The NIC should therefore consider how it can help to improve road and rail links from London to its regional airports so they can continue to fulfil their role in connecting people and business to the Capital.

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5. **LLA is growing.** In December 2013 LLAOL got the go ahead to begin a £110 million redevelopment of the airport site. This construction programme is now well underway and is set to grow the capacity of the airport from 12 million to 18 million passengers by 2020. A LLAOL commissioned economic impact assessment, undertaken by Oxford Economics and published in November 2015, calculated that LLA's contribution to the national economy is set to increase by 77% from £1.3 billion in 2013 to £2.3 billion per annum by 2030. Such a huge increase in the economic output of the airport shows just how vital aviation infrastructure growth is to the UK economy.
6. Therefore, LLAOL believes that the **Government should provide support to regional airports** to enable them to grow. As outlined above, LLA is set to increase its capacity by six million by 2020. LLAOL calls on the Government to recognise the vital role that regional airports play in acting as key economic engines for the UK, particularly in the south east of England. The Airport Commission's final report states that it is **"imperative"** that regional airports like Luton continue to grow and make best use of their capacity, and we repeat our call to the Government to ensure that we are allowed to do just that when it publishes its next Aviation Policy Framework in 2016. We accept that airport capacity is not a part of this inquiry, however we urge the NIC to recognise how regional airports can assist in the growth of London as a major world economic centre through better surface access links.

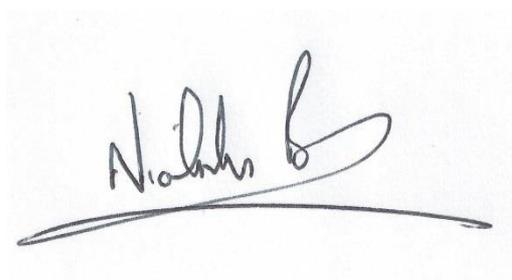
The importance of London's transport infrastructure to LLA's success

1. **LLAOL believes that improved surface access to London's airports is vital to the success of London's transport network both now and in the future.** It is imperative that LLA remains a viable option for both commuters and passengers from central London. For this to happen, a number of key improvements to the rail infrastructure between London and LLA are needed to cater for the extra capacity provided for by the redevelopment. These improvements include:
 - i. LLA is the fastest airport for passengers to reach from central London with a journey time of only 19 minutes. However, this train service is only available once an hour and LLA remains the only London airport without 'Express' services. LLAOL is therefore engaging with the Department for Transport in the build up to the East Midlands rail franchise to ensure that this one fast train per hour is increased to four. This achievable change would essentially provide LLA with a comparable 'Express' service from St. Pancras International to Luton Airport Parkway Station.

- ii. The journey between Luton Airport Parkway Station and the airport itself is currently a suboptimal solution for passengers. A shuttle bus ride is required to complete the journey from the rail station. LLAOL accepts that this is an issue that needs to be addressed to deliver the excellent customer experience that our passengers expect. LLAOL and its main shareholders, AENA and Ardian, are currently exploring a number of solutions:
 - A light rail solution connecting Luton Airport Parkway station to the airport site.
 - A heavy rail solution that would create a spur connecting the airport site directly to the main rail line to central London.
2. **LLAOL can provide support to the Government's investment strategy for transport infrastructure.** LLAOL is prepared to help the Government ease the financial burden of this construction by funding the surface access upgrades outlined in point (ii) above by itself. LLAOL and its shareholders, AENA and Ardian, are simply seeking explicit support for its plans from the Department for Transport.
3. **LLAOL can support the NIC** in how it can best include aviation infrastructure development into the Commission's thinking. As a first step, we recommend meeting with Commission members to outline in greater detail why aviation infrastructure is essential to the UK's infrastructure stock and why the Heathrow and Gatwick debate can easily sit outside the broader discussion on improving the overall quality of the country's airports.

Thank you for taking the time to read this submission. I would be happy to discuss the issues raised with Commission members at the earliest convenient opportunity.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Nick Barton', with a long horizontal flourish underneath.

Nick Barton
Chief Executive
London Luton Airport Operations Limited (LLAOL)

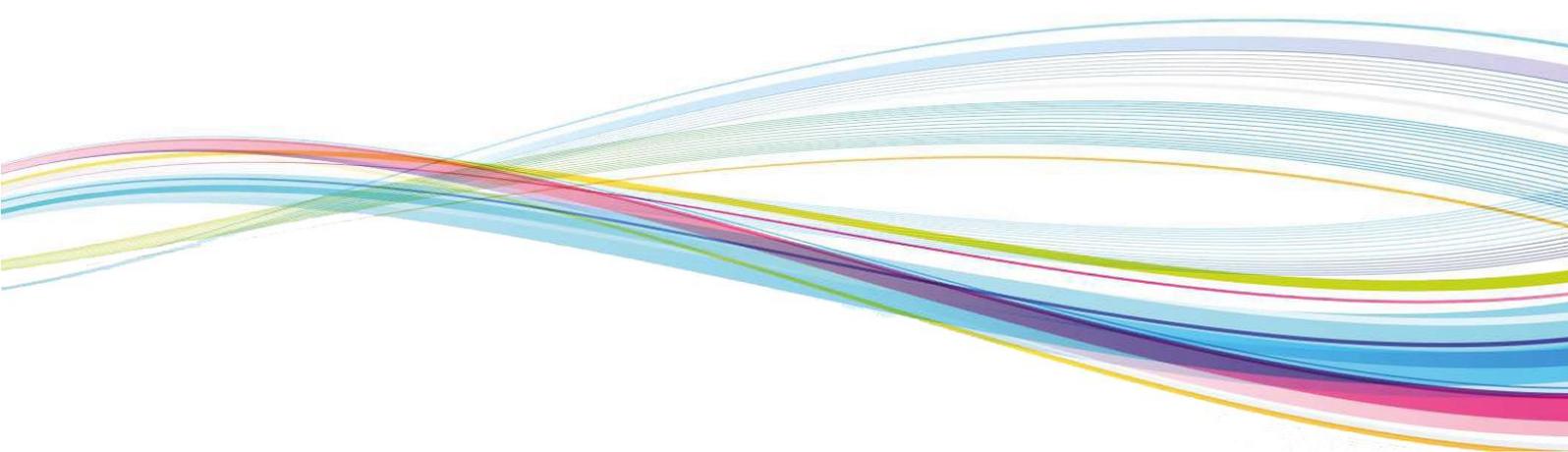


your pension our world

London Pensions Fund Authority

**LONDON PENSIONS FUND AUTHORITY
CALL FOR EVIDENCE TO THE NATIONAL
INFRASTRUCTURE COMMISSION OPEN
CONSULTATION**

7 JANUARY 2016



Introduction

London Pensions Fund Authority (LPFA) welcomes the National Infrastructure Commission's Open Consultation into the development and funding of the UK's long-term infrastructure needs.

In submitting our response to the consultation, we do so as a fund within the Local Government Pension Scheme (LGPS) which:

- Has already in its own right made direct investment into a number of smaller-scale infrastructure and construction projects; and,
- Will, as part of a larger funding pool (explained below), also be a prospective direct funder of larger-scale infrastructure projects in general, whether nationally or regionally-focused, or within a specific sector, such as transport or utilities.

As such, our response to this consultation outlines:

- Why we consider direct investment in infrastructure to be a highly desirable strategic asset allocation option for LGPS funds;
- How the wider LGPS is evolving in the shorter term to pool funds so that the sector can participate in larger-scale infrastructure funding opportunities;
- Our own experience to demonstrate how LGPS funds can successfully collaborate for pooling purposes and to fund larger-scale infrastructure development;
- Proposals for a mechanism whereby infrastructure opportunities could be more effectively and speedily matched with prospective LGPS investors.

Why we consider direct investment in infrastructure to be a highly desirable strategic asset allocation option for LGPS funds

Infrastructure is a very attractive investment for pension funds. It provides inflation protection, since assets often include an inflation linkage. Moreover, it produces a long-term income with consistent stable cash flows over a long term time horizon. The scarcity of good quality assets and active management also leads to capital appreciation. And, there is the opportunity to benefit from supernormal returns, since there is often an element of development risk.

However, as the LGPS is currently structured, with multiple smaller funds, it is not easy for these smaller funds to invest in this asset class. Currently, infrastructure makes up a very small amount of LGPS assets under management (AUM). Scale and expertise is required to be successful. LPFA has actively been calling for collective investment between LGPS Funds as a positive step forward, both in enabling LGPS funds to address their deficits and to facilitate much-needed investment in UK infrastructure.

How the wider LGPS is evolving in the shorter term to pool funds so that the sector can participate in larger-scale infrastructure funding opportunities

The LGPS is currently undergoing a period of radical reform, which will see the 89 individually-small pension funds that currently make up the scheme, potentially join forces and pool their c. £200bn AUM to create a number of £25bn+ wealth funds from 2018.

Through collaboration, these pooled funds will have the capacity to scale up their direct investment in large-scale infrastructure projects in the same way that, for example, overseas-based Sovereign Wealth Funds and pension funds (e.g. Ontario Municipal or Australian Super) have been able to invest. To-date as individual small funds, LGPS funds have typically lacked the scale to invest directly in infrastructure and have, in the main, been restricted to investing in funds or funds of funds. These options are often expensive and do not necessarily offer the long-term return that funds seek.

As the National Infrastructure Commission may be aware, a two-stage submission process is already underway, run the DCLG. Briefly, the first stage completes on 19th February 2016, by when individual LGPS funds are required to submit their initial pooling proposals to government. Thereafter, refined and completed submissions will be required from funds by 15 July 2016.

Funds' proposals are to include, amongst other things, how infrastructure will feature in a fund's investment strategy and how the pooling arrangements will improve the capacity and capability to invest in infrastructure. Government expects that pooling proposals which meet its criteria will be in place within 18 months. This is a relatively short timescale for a new and very significant pool of funding to be available for UK infrastructure.

Pooling will undoubtedly make the LGPS funds a valuable long-term funding source for those UK infrastructure projects that offer the appropriate level of risk versus reward over the long term in relation to the liabilities to be matched. And, importantly, LGPS funds are directly connected to their regions and are potentially ideal 'local partners with local knowledge' for regionally important infrastructure projects.

We are thus making this submission to ensure that this potential source of long-term funding is considered by the National Infrastructure Commission in its Call for Evidence.

Although LPFA cannot 'speak' for other funds within the LGPS, we can show by our own experience that there is already a strong appetite for pooling to create scale for direct investment in infrastructure.

Our own experience to demonstrate how LGPS funds can successfully collaborate for pooling purposes and to fund larger-scale infrastructure development

The LPFA is one of the 89 authorities that make up the LGPS in England and Wales. On our own, we have some £4.6bn assets under management (AUM) and we look after the long-term pension provision for around 80,000 active, retired or deferred members.

We have already been an active participant in pooling arrangements, specifically to enable us to increase our direct investment in infrastructure and, more generally, to expand our fund, so we have the capacity to invest directly in a number of asset classes. At present, we invest 5.5% (£270m) of our fund in infrastructure, with an ambition to grow this to 10%.

Our current projects include:

- To provide 85% of the funding for the fast-track creation of new high-quality homes in East London. The development will include 150+ private-rented-sector homes, 40+ for affordable rent and 30+ for shared ownership, whilst the project will also improve access to the popular Thames Barrier Park.
- In 2014/2015, we collaborated with a like-minded fund, the Greater Manchester Pension Fund (GMPF), to create a £500m joint infrastructure investment fund. The first long-term investment – a renewable asset – was announced in October 2015, with more to follow. Previously, both LPFA and GMPF had individually made direct investment in smaller-scale infrastructure projects in their respective region. This collaboration is a natural next step for two funds that have experience of direct investment in infrastructure and have now gained valuable in-house expertise in this type of investment.

We are also actively pursuing new partners to build this partnership for the express purpose of what the National Infrastructure Commission is aiming to meet – to further invest in projects from house and road building, to commercial and mixed use developments, or large scale regeneration projects. Our aim is to provide a vehicle for other LGPS funds to invest in infrastructure and thus grow the pot substantially.

We are currently in discussions with the DWP and Treasury about this option and would welcome the opportunity to provide the Commission with further information.

- LPFA and Lancashire County Pension Fund have created a £10bn pool. This is the first partnership of its kind within LGPS and once it is FCA approved (expected within Q1 2016), the fund will be open to multiple LGPS funds to collaborate and pool resources. This pooled fund will invest across a broad range of asset classes and again bringing to bear their individual past experience, infrastructure will feature highly in strategic asset allocation.

Proposals for a mechanism whereby infrastructure opportunities could be more effectively and speedily matched with prospective LGPS investors

Pooling will allow funds to harness resources, use economies of scale and share talent in order to make a difference in investing in infrastructure. However, pooling only solves part of the problem. Whilst it may allow us to access sufficient funds needed to invest in larger-scale projects, it does not help us to source and access infrastructure deals.

Along with the Local Government Association, we are advocating an LGPS body which could match infrastructure opportunities with prospective investors.

We believe local government is the ideal partner for these private infrastructure deals. Innovative councils can identify projects suitable for direct investment and are in a key position to collaborate with investors to develop these ideas. It also goes without saying that they negate a certain level of political risk by acting as a local partner in a multinational consortium.

Arguably nationally important projects should be funded by public borrowing as the cost of capital will most likely be lower than the equity returns institutional investors require. However, with the Government's stated objective of reducing public sector borrowing it creates a scarcity of available 'balance sheet'. Nevertheless, we believe Government should be creative in leveraging the balance sheet available and seek ways in which it can share/offset the low probability, but large impact, risks that would put off private investment (e.g. Construction risk in large Greenfield projects).

The LGPS body, which we firmly believe needs to be created, would play a pivotal role in matching investors to investees and assist in attracting private investment.

It would be responsible for gathering information about potential infrastructure and housing investments, and subsequently matching councils and private investors together, presenting the right opportunities to these interested parties, so they could put their own money forward through co-investment. We believe this body will be most successful if it were also deploying capital directly into many of the same projects. This will ensure efficient deployment of resources toward projects that are more likely to be investable and engender confidence amongst the end co-investors.

In order to fulfill its role, the body would also need to have a properly staffed investment function with an agreed set of criteria, potentially working in parallel to the Commission. A strong symbiotic relationship would clearly exist between the NIC and this proposed body; we would welcome the opportunity to speak about this in more detail.

January 2016

National Infrastructure Commission: Call for Evidence

Response from the London Stansted Cambridge Consortium

London Stansted Cambridge Consortium

The London Stansted Cambridge Consortium (LSCC) was formed in June 2013 as a strategic partnership of public and private organisations covering the area north from Tech City, the City Fringe, Kings Cross, and the Olympic Park, up through the Lee Valley, the M11, A1 and A10 road, the East Coast and West Anglia Mainline rail corridors to Stevenage, Harlow and Stansted, and through to Cambridge and Peterborough. The consortium brings together 18 local authorities and the Lee Valley Regional Park, around a common growth agenda, with a cross-party Board composed of Leaders and Lead members.

Crossrail 2 is seen as an important element in the long-term future of this corridor and we are therefore pleased to make a submission to the National Infrastructure Commission's call for evidence.

In summary

- The London Stansted Cambridge Consortium strongly supports Crossrail 2 and the significant impact this will have on the accessibility and connectivity of the region;
- 4-tracking the West Anglia mainline north of Tottenham Hale in Control Period 6 as an early precursor to Crossrail 2 will help to maximise the benefits of Crossrail 2, accelerating growth by nearly a decade;
- Crossrail 2 is vital for the continued economic growth of this region because it will:
 - Support the global competitiveness of this internationally important high-tech, high growth economy;
 - connect areas with growth and development potential with areas of employment opportunity – increasing the capacity for growth in leading sectors;
 - tackle lost productivity from concentrated disadvantage by opening job opportunities in the wider region to people in poorer areas with low rates of employment;
 - support economic and jobs growth along the whole of the route;

- shape growth in ways which enhance liveability overall, and concentrations of activity in the areas that most want them;
 - alleviate capacity problems on other lines, specifically the Victoria and Piccadilly Line;
 - improve the speed and reliability on lines that will share the Crossrail 2 infrastructure.
- As Crossrail 2 progresses there must be close coordination with the planning authorities to ensure that the full benefits of this investment are captured in the long-term planning for the region;
 - Other investment will be needed to support the levels of growth projected, including in our strategic road network, as well as in assets such as the Central Line.

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

The principal challenges will be:

1. Supporting the high-knowledge, high-growth economy, not only in central London, but also in key locations such as the Lee Valley corridor, Cambridge, Hertfordshire and Essex. This region's competition is global, against locations such as Boston, "Silicon Valley", Berlin and Singapore. In terms of growth rates we currently compare favourably, but investment such as Crossrail 2 is key for retaining our competitive strength.
2. Supporting the high-levels of population growth in the region. The 2001 to 2011 census demonstrated that the LSCC region delivered 10% of England's growth in that 10 year period. Similarly ambitious growth projections and plans are being developed in the region for the next plan period to 2031.
3. Airport capacity: Stansted Airport has significant capacity for growth within its current planning permission, with no additional runway.

Major investments are the only way to really unlock potential future growth in the London Stansted Cambridge corridor. A handful of smaller schemes will not have the same transformative impact in the area, as 4 tracking the West Anglia Line, with a commitment to build Crossrail 2.

Global economic significance

London and Cambridge are ranked first and fourth respectively in the FDi (Foreign Direct Investment) Intelligence "Top European Cities of the Future" produced in 2014 based on their favourability for inward investment. Cambridge already has over 320 foreign-owned enterprises, supporting nearly 20,000 jobs and contributing almost £5bn in turnover. Hertfordshire LEP notes a 61% increase in inward investment decisions since 2012/13. In addition 14 Cambridge-born companies have revenues over \$1bn, with two (ARM and Autonomy) valued at over \$10bn. Not investing here could mean that business goes abroad and the UK loses out.

Housing delivery

ONS forecasts predict the need for 16,800 new homes a year in the LSCC area, although this may prove higher.

Early delivery of 4-tracking will bring forward by up to a decade much needed new homes for the region, as well as significant employment growth in the Upper Lee Valley. The approval of the Tottenham Hotspur stadium, as well as progress on Meridian Water demonstrates not only the scale of the ambition, but also how rapidly change and growth is happening.

On-going case making

The LSCC has been working to demonstrate the economic case for significant investment in the West Anglia Line, and specifically the delivery of 4-tracking in the Upper Lee.

Last year the consortium published "[The Strategic Case for Investment in the West Anglia rail route](#)", setting out:

- a) The huge economic importance of the London-Stansted-Cambridge Corridor;
- b) The large levels of economic and population growth already happening in the corridor;
- c) The role that investment in the West Anglia Line will have in enhancing the labour mobility and economic effectiveness of the region.

As part of its support for the *West Anglia Taskforce* the LSCC is developing a more in-depth analysis - examination of economic characteristics and trends of local economies along the West Anglia Main Line by June 2016.

This includes:

- Full economic assessment / baseline,
- Appraisal of land/housing demand and needs from established documents and methods (e.g. the East of England Forecasting Model) ,
- Review of local plans, major developments and permissions that are 'material' to West Anglia route and improvements,
- Individual district profiles (allows more detailed consideration of improvement/works options),
- Overview of other planned and desired transport majors – road, rail, public transport

In addition the consortium is delivering workshops with local partners to examine this in more detail: LEPs, planning authorities, counties and private sector.

This work is being developed with the Crossrail 2 team, in conjunction with the GLA and TfL and will be made publicly available.

The chair of the London-Stansted-Cambridge Consortium is a member of the Crossrail 2 Growth Commission, as well as the West Anglia Taskforce. In addition

the LSCC supports the independent London-Stansted-Cambridge Growth Commission. All are looking to report in the early summer. The LSCC will work to support a coordinated approach on the development of their work and ensure that the National Infrastructure Commission is aware of the development of their various findings.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

The LSCC is not in a position to discuss all the strategic infrastructure needs for London.

However we raise the point that past alignments of Crossrail 2 included proceeding via Leytonstone northwards, which it no longer does. Consideration still needs to be given to Central Line services, and the growth planned along this north-east element. Enhancements will be needed along the Central Line and we will be seeking further discussions with TfL on this.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Early deliver of 4-tracking

The Chair of Network Rail, Sir Peter Hendy, in a recent speech stated there is a clear case for early investment in Crossrail 2, with West Anglia Main line 4-tracking occurring in Control Period 6 – 2019-2024.

The early delivery of 4-tracking the West Anglia Main Line (WAML) north of Tottenham Hale is one of the major deliverables to increase the benefits of Crossrail 2. The Upper Lee Valley corridor has the potential to deliver 10's of thousands of new homes for London and the wider South East. The WAML is currently only two tracks, which means that fast long distance services, such as the Stansted Express, come in conflict with slower, inner suburban stopping services. Not only does this restrict capacity and line speeds it also causes poor reliability on the route. The STAR scheme, delivering additional services between Angel Road and Stratford, confirmed for Control Period 5, recognises that additional capacity is needed to unlock sites such as Meridian Water and Tottenham.

Early completion of 4-tracking, in Control Period 6 as a precursor to Crossrail 2 will bring forward much needed housing and economic regeneration by up to a decade.

The LSCC is looking for early WAML implementation of enabling works:

- Committed schemes must be delivered as soon as possible including enhancements between the Upper Lee Valley and Stratford. This is specifically the STAR scheme, which we were pleased to see remains committed for delivery in Control 5 in the recent "*Hendy Review*" published in November 2015;

- Development of solutions to the 5 level crossings identified as high safety and performance risks including suitable alternative provision;
- Junction and line speed improvements at existing pinch points;
- New platform provision at Stratford station should be pursued so that there is future capacity to serve a growing corridor;
- Design for four tracking along with necessary powers and land purchases.

Segregation of faster long distance services and slower inner suburban services, ensuring the two services do not clash with each other, is vital.

The early enhanced link to Stratford and the Olympic Park would provide this key location with its only rail link to the north, as well as strengthen the Lee Valley link, supporting economic growth to the north.

Links to Stansted Airport

The Airports Commission specifically raised the need for early investment to improve the rail link to Stansted Airport, with their Chair writing to Network Rail calling for an early investigation to its feasibility.

Stansted Airport currently serves 22.5 million passengers a year and is the only major airport in the south east with runway capacity today and room to grow in the future. With a new runway in the UK at least 15 years away, it is vital that Government make the most efficient use of current airport infrastructure, and improving surface transport access should be a key tenet of this approach.

The airport also employs over 11,000 people and is the biggest single site employer in the East of England. As the airport continues to grow, it will need to widen its labour pool and better transport links are critical, particularly if Stansted is to be seen as a viable and attractive location for skilled and un-skilled labour.

Crossrail 2 will greatly enhance the accessibility and connectivity of the airport, specifically for passengers in south west London and Surrey which are currently underserved by transport links to Stansted. Four tracking the WAML will deliver faster and more frequent trains while connectivity with Crossrail 2 will further help to unlock spare capacity at Stansted and meet the demands of a growing airport labour market. The interchange at Tottenham Hale between Crossrail 2 and Stansted Express services will be critical to creating a seamless door to door passenger experience.

Rather like Heathrow Airport, which is served by the Heathrow Express, Heathrow Connect and the Piccadilly line, longer-term consideration should be given to the opportunity for Crossrail 2 to provide a stopping service to the airport.

Linking the economy of the region

Locations such as Harlow and Stevenage have major growth ambitions, delivering not only new homes but a strong diverse economy. They are already home to high-tech businesses as diverse as GSK, Airbus and Raytheon, while public sector investment, such as the relocation of Public Health England to Harlow and the cell therapy manufacturing to Stevenage, will further accelerate this.

Overall investment must not be seen as just serving the needs of London, but also making links to already strong regional economies, in locations such as Hertfordshire and Essex. The links northwards for both the west and east branches of Crossrail 2 need to ensure strong connectivity.

We note that the Thameslink upgrades will have a significant positive impact for connectivity between locations such as Stevenage and Cambridge with central London and onwards to Gatwick.

Cambridge

As noted Cambridge is a globally competitive location for life sciences and high technology innovation, with significant expansion planned over the next 20 years.

The business network Cambridge Ahead cites the key barriers to future growth as:

- a) congestion getting to the city and its employment locations;
- b) access to talent and the need to extend the city's labour market;

We must see investment beyond servicing London's needs. Investment in additional capacity in the West Anglia Main Line must provide additional capacity for Cambridge. Relatively small investments, such as an Addenbrooke's Station (a site projected to deliver 20,000 new jobs in the next decade, including the relocation of AstraZeneca HQ), and at Ely junction (improving Cambridge's role as a rail hub), will further maximise the benefits of Crossrail 2 investment.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

As has been seen with Crossrail land and property values raise in expectation of future enhancements. There must be close coordination between the GLA, TfL, London Boroughs and other planning authorities to ensure that planning policy is coordinated to maximise the benefits for the region.

A key issue is to ensure that we build in the funding arrangements to give the private sector certainty about their levels of contribution to the funding of Crossrail 2, plus local contributions. Planning authorities will be developing their policies (for example social infrastructure and affordable housing contributions) which reflect changes in policies to sites, driven by the increased accessibility delivered by Crossrail 2. We need to ensure that land prices do not rapidly increase, based on speculation, affecting the viability for high quality development. For example viability considerations are often cited as the reason why lower levels of affordable housing is proposed than that set out in planning policy.

To make sure that the benefits of Crossrail 2 are captured there needs to be an early comprehensive assessment of current land values, which should then be used to capture increases and recoup some of the uplift. We would also look to the private

sector to provide significant funding as businesses will directly benefit from London having a major new route.

LB Redbridge undertook a Crossrail Corridor Area Action Plan to coordinate development and enhance the regeneration impacts at key sites. Building on the work of, for example, the Upper Lee Valley Opportunity Area Planning Framework consideration is required for a collaborative regional planning mechanism, working across administrative boundaries to ensure a coordinated approach to maximising the benefits of Crossrail 2 whilst ensuring that new development does not threaten the valley's landscapes and ecology.

National Infrastructure Commission call for evidence, 8 January 2015

Via email: londonevidence@Infrastructure-Commission.gsi.gov.uk

London TravelWatch is the statutory body representing all transport users in London and rail users within the wider London Rail Area which includes London's airports

London TravelWatch welcomes the opportunity to respond to the commissions' consultation, as it touches on areas of significant concern to users of London's transport networks, and which London TravelWatch as a passenger representative body has carried out significant research in recent years.

London TravelWatch has produced a series of transport user priorities for the 2016-20 Mayoral term based on our research and our passenger contacts. This response reflects these priorities:

1. Sustained investment to meet London's ever-growing transport needs
2. A road network that makes the best use of scarce capacity
3. As many of London's rail services as possible coordinated by the Mayor
4. Reliable bus services that keep up with the pace of change
5. Simpler fares, better value for money and a fairer deal when things go wrong
6. A co-ordinated approach to transport interchanges
7. Transport networks accessible to all
8. Reliable, accessible and timely information
9. Everyone able to travel without fear of crime or anti-social behaviour
10. Disruption effectively managed

Consultation questions

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

Transport is a derived demand. It therefore follows that it needs to respond to the economic and social challenges of population growth, job creation and distribution, the supply of housing, the affordability of fares and regional connectivity. Provision of transport can open up opportunities for education, employment, and the provision of services that would otherwise be difficult to access; it can allow development of housing that is both desirable and affordable: and develop regional economies through the benefits of aggregation, knowledge sharing and sociability. Equally, congestion, crowding, a poor living environment and the lack of effective and reliable transport services can hold back the development of new housing, the creation of new jobs and educational opportunities. The challenge is to improve accessibility in a way that is affordable to both the fare payer and taxpayer, and which meets the aspirations for service standards for both.

The capacity constraints that create congestion and crowding issues are in our view the most important issues that the infrastructure commission should focus on, and where investment is most needed. Creating additional capacity can be done in a

number of ways, and will range from large projects such as Crossrail 2 to modest small scale investments e.g. improving walking routes within interchanges or additional entrances to existing stations. These smaller schemes can add considerable value compared to their modest costs in creating new capacity, relieving crowding and congestion that exists already, improve connectivity and reduce journey times.

The need for this continued and enhanced investment in capacity is reflected in the views of passengers. During focus groups for our recent affordability research¹, it was apparent that even amongst low earners, there was a clear desire for investment aimed at reducing journey times, crowding and congestion, even if this meant more expensive ticket prices, although there was an overall resignation to the high cost of travel. Behind this was a recognition that better transport connectivity gives better access to a wider range of job and educational opportunities, allowing for career progression and increasing income, and housing that would better suit their circumstances and aspirations.

In a complex city such as London, where the most journeys are made using a variety of modes this suggests that improving the number and quality of public transport interchanges² is the most cost effective way of delivering additional capacity on the transport network, delivering economic growth and sustaining population growth. London TravelWatch argues that the investment in London's transport in recent years has been the catalyst that has allowed London's economy and population to grow.

This growth has in part been sustained by the continuous income stream that fares on the public transport network and the Congestion Charge on roads, and it would be important that this is protected to allow investment to continue, and in the case of roads there is an argument that pricing should play a greater role. Nevertheless passengers tell us through our research³ that their primary concerns are the affordability of the transport network, its' reliability and the travelling environment that they experience.

Affordability

London TravelWatch with its partners Trust for London and London Councils recently conducted research on transport affordability in London⁴. This found that:-

¹ http://www.londontravelwatch.org.uk/documents/get_lob?id=4100&age=&field=file Living on the edge: the impact of travel costs on low paid workers in Outer London.

² http://www.londontravelwatch.org.uk/documents/get_lob?id=4040&field=file Interchange Matters: Passenger priorities for improvement

³ http://www.londontravelwatch.org.uk/documents/get_lob?id=3780&field=file The London Travelling environment : what consumers think

⁴ http://www.londontravelwatch.org.uk/documents/get_lob?id=4100&age=&field=file Living on the edge: the impact of travel costs on low paid workers in Outer London.

- Most people living in London are resigned to the high cost of travel; they need to get to work and have no choice but to put up with the costs involved because they lack viable alternatives.
- 64% of all Londoners who commute to zone 1, which equates to around 1 million people tend to choose the quickest or best journey available to them to get to work, including many people on a lower income. 36%, or a projected 500,000 commuters, are not using the quickest or best journey option available to them.
- However, travel cost is one of the main factors in the route chosen by one in four, or a projected 180,000 people, commuting to Zone 1 from outer London and the equivalent of around 145,000 workers living in outer London choose the cheapest route to work rather than the shortest or most convenient.
- 9%, or a projected 70,000, outer London residents who commute to zone 1 could get to work faster if they spent more.
- Over one in five, or a projected 156,000, commuters who commute from outer London⁵ to zone 1 have to cut other spending to pay for travel to work.
- London residents earning more than £600 per month have to work approximately 20 minutes every day they work to pay for that day's commuting costs. This increases sharply to 54 minutes for those earning £200 to £599 and 1 hour 56 minutes for those earning less than £200.
- Travel to work accounts for almost one tenth of a manual worker's average earnings.
- Lower earners are more likely to use the bus and some choose this method to reduce their travel expenditure.
- Everyone is concerned about rising travel costs but people on low incomes are worried that further increases could affect their ability to earn a higher salary by working in Zone 1.

This concern with cost is a challenge, as there will need to be a balance between securing funds for investment and the need to restrain cost increases for transport users.

London's passengers, through the fares they pay, cover a significantly greater proportion of operating costs of their transport system than other areas of the UK and comparable cities in Europe. This has the benefit in that this allows a much greater certainty of investment return and long term sustainability of the system.

⁵ For this report, outer London is the 14 boroughs situated around the edge of the Greater London Authority area plus the boroughs of Brent, Ealing, Haringey, Barking & Dagenham and Merton.

However, rail passengers tell us that their number one priority for improvement is better value for money for the price they pay for their tickets⁶.

Reliability

Bus passengers in London (who account for over half of all public transport users in London and over half of all bus users in Great Britain) tell us that they want their services to be more reliable, and have consistent journey times. This is especially true of younger people in education or entering the employment market, who are unable to afford faster modes of public transport or more expensive private transport.

Rail passengers also want their trains to operate more reliably, consistently and have sufficient capacity for them to travel in comfort. This will require upgrades to capacity of the network in terms of train frequency and length. The National Rail network in London needs to be provided with services that are of a 'turn up and go' nature i.e. at least every 15 minutes throughout the operational day.

Travelling environment

When we asked passengers about their travelling environment they told us of many concerns. Most importantly is their concern for their personal security, not just being a victim of crime, but just as importantly having to deal with anti-social behaviour.

Passengers also regard overcrowding, particularly at peak travelling times, as an important issue for them which exacerbates other discomforts such as noise. Finally, though not at the top of passengers concerns they do want stations, trains and buses to be clean and clear of litter and graffiti which they associate with anti-social behaviour

2. What are the strategic options for future investment in large – scale transport infrastructure improvements – on road, rail and underground – including, but not limited to Crossrail 2?

- How should they be prioritised, taking account of their response to London's strategic transport challenges, reliability, journey times and connectivity to jobs?
- What might their potential impact be on employment, productivity and housing supply in London and the South East?

As noted above the priorities for improvement in the transport network need to be focused on improving affordability (including passenger value for money and the

⁶ Transport Focus research <http://www.transportfocus.org.uk/research/publications/rail-passengers-priorities-for-improvements-october-2014> , London TravelWatch research . http://www.londontravelwatch.org.uk/documents/get_lob?id=3734&field=file and http://www.londontravelwatch.org.uk/documents/get_lob?id=3896&field=file

ability to access a wide range of jobs and services), reliability, capacity (including reducing crowding and congestion), connectivity (including reducing journey times) and improving the overall travelling environment.

Therefore any transport schemes that are brought forward need to meet a number of tests that cover these elements :-

- Does it increase the accessibility of jobs and services?
- Does it improve the reliability of the existing network?
- Does it provide sufficient additional capacity where it is most needed?
- Does it reduce the incidence of crowding and congestion?
- Does it improve the overall connectivity of the London and South East region?
- Does it reduce overall journey times?
- Does it improve the overall travelling environment?

London TravelWatch has previously recommended⁷ a number of infrastructure projects that would meet these tests, address the issues that have been identified above and increase the opportunities for employment growth and housing provision. These include:-

Rail

- Developing the Chiltern rail route within Greater London, with improved frequencies and a diversion of longer distance services to serve Old Oak Common (for the development corporation area and interchange with Crossrail and other rail routes).
- A bigger interchange at West Hampstead with platforms on the Chiltern and Metropolitan lines, reducing journey times and increasing accessibility of jobs and services
- Resignalling London's national rail routes to enable higher frequency services to be run
- Linking the Great Northern City branch (Finsbury Park to Moorgate) to rail routes in South London e.g. the London Bridge – Tulse Hill corridor, relieving congestion in the City, but enabling development of areas such as that around South Bermondsey station for new housing
- Improving rail access to Heathrow Airport with western and southern rail routes, including the opportunity to develop housing and improve access to job opportunities.
- An electrified Reading – Gatwick Airport rail route – outside of London but of strategic importance to it, because of its ability to give an alternative to travel via London or by car via the M25.

⁷ http://www.londontravelwatch.org.uk/documents/get_lob?id=3916&field=file Potential future transport projects for London – June 2014

- A reinstated and electrified Southall – Brentford rail link and an electrified West Ealing – Greenford rail route to improve access to jobs and open up new opportunities for housing, and to remove the need for non-standard diesel operation.
- New capacity at central London rail and underground stations through new entrances and link tunnels e.g. Covent Garden to Temple, new entrance to Waterloo East, City Thameslink to St. Pauls. Camden Town to Camden Road, Regents Park to Great Portland Street and linking the two Edgware Road stations.
- A new station at Maiden Lane serving the Kings Cross developments, but from the catchment area of the North London Line, improving access to employment and new areas of housing.
- Improving connectivity in South London by building a bigger interchange at Brixton with platforms on the London Overground and Victoria – Dartford routes, and an interchange at Brockley with platforms on the Victoria – Dartford route. These would open up access to employment and housing across a very wide area.
- Extending the Bakerloo line to Lewisham, Bromley North, Hayes and West Croydon, with significant opportunities to improve access to employment and encourage housing development.
- An ‘outer circle’ rail route linking London’s outer boroughs, to improve access to housing and employment.
- Upgrading the Felixstowe – Ely – Nuneaton rail freight route to allow diversion of freight services away from the Great Eastern, North London and West Coast Main Line routes to free up capacity for passenger services.

Light Rail

It is of concern that the role that light rail in London could play is being overlooked. Passenger loadings along some existing corridors and potential growth corridors will be such that light rail would be the appropriate mode. We have previously supported the proposed extensions to Croydon Tramlink, West London Tram and the Cross River Tram proposals. Like these latter two, there are many other corridors where high levels of bus passenger numbers would imply that light rail may be an appropriate mode. The potential of further light rail schemes in London should be investigated.

Roads

Unlike passenger transport schemes where the demand can, to some extent, be managed by price, additional road capacity in an urban transport environment will be self-defeating because of the latent demand for road travel. Similarly measures to encourage modal shift will have the effect of releasing latent demand.

London TravelWatch supports a wider, more sophisticated system of roads pricing in order that demand can be managed properly on London's road network and the need for additional road infrastructure can be assessed. This would enable more reliable essential motor vehicle journeys and have the additional benefit of releasing funds for investment in transportation schemes.

That said London TravelWatch has supported the mayor's east London river crossings subject to various caveat regarding tolls, the provision of public transport and assurances that the wider road network does not become more congested.

One of the key infrastructure investments in London is the continued programme of bus priority. London TravelWatch believes that buses should have priority on all bus routes and that there is much to do to achieve this.

Cycling and walking

London TravelWatch supports continued investment in safer cycling and walking to allow and encourage increased use of these modes of travel, especially for shorter journeys, thereby freeing up additional capacity on the public transport and road networks thereby improving journey time reliability, crowding and congestion.

In particular, reusing redundant railway infrastructure for cycling and walking schemes e.g. Finsbury Park to East Finchley and Alexandra Palace, to reduce traffic congestion on major arterial roads by offering alternative routes and modes of transport, and on improving the public realm generally. Other potential ideas could include a pedestrian and cycle link between Canada Water and Canary Wharf.

Interchange

Londoners, make more multi-modal journeys than elsewhere, typically using two or three different modes to get around. This means that interchanges play a significant role in the experience of London's travellers. Research by London TravelWatch shows what passengers think good interchange looks like⁸.

Good interchange is often overlooked, but is as important as the services from the interchange. Increasing the usefulness of existing routes and interchanges; adding new ones to existing networks where this would steer growth towards the areas and routes that have the capacity to absorb this, and to relieve existing congestion and crowding. Examples of this would be the extension of the Bakerloo line into South East London⁹ and developing a Chiltern Metro, including additional platforms at West Hampstead.

⁸ http://www.londontravelwatch.org.uk/documents/get_lob?id=4040&field=file Interchange matters: passenger priorities for improvement.

⁹ http://www.londontravelwatch.org.uk/documents/get_lob?id=3940&age=&field=file Bakerloo line extension consultation response.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Co-ordination of HS2 at Euston with a future Network Rail scheme at their station. We have received assurances that any Crossrail 2 scheme would be built having regard to a future Network Rail scheme it would seem poor value for money if the Crossrail 2 proposals were developed in isolation. We strongly recommend that Euston is developed as a single scheme.

Interchange is really important to passengers who regard interchange as necessary, but not desirable. Crossrail would be an opportunity to develop first class interchanges at the stations served. We would expect Crossrail 2 to do as Crossrail 1 has and develop proposals for not only the stations, but also the public realm around them and the routes to nearby transport objectives such as the local town centre. Unlike Crossrail 1 any additional public realm works should be funded.

The stations served by Crossrail 2 should act as catalyst for promoting development and regeneration at, above or nearby.

Consideration should be given to the extension of Chessington branch of Crossrail 2 beyond the London boundary to Leatherhead to form a through line, and open up area around Malden Rushett for housing development.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvement in London, including Crossrail 2?

- What is an appropriate local and regional contribution – given the potential distribution of benefits to business, residents and transport users and the wider economy – and how could this be achieved?
- What innovative funding mechanisms could be considered to support delivery of key schemes?

As stated above the affordability of the public transportation system is very important both in terms of the proportion of an individual's income, but also as a tool of transport policy. The latter is often forgotten, but if the cost of public transport is too high we know it will be used less. Some of the demand will translate into private motor vehicle use which will exacerbate London's problems of congestion.

In order to secure the maximum social, economic and environmental benefits that a good public transportation system can contribute to then public investment is required. In addition to passenger fares, a mixture of funding from general taxation, roads pricing and land / property value uplift should be used. Additionally it is vital that all passengers pay their way and that this is assured through high levels of enforcement.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied to London?

London TravelWatch's limited resources do not allow us to give direct comparisons with other areas, however, we note that in dense urban areas such as Hong Kong, development has been successfully tied to the implementation of transport schemes. This approach has been done in London in the past e.g. the Metropolitan Railway constructed Chiltern Court above a reconstructed Baker Street station: In the 1980's British Rail redeveloped the former Holborn Viaduct station to include the low level City Thameslink station and office development above. This could be repeated in the future, but with careful consideration of the needs of existing passengers and users during and after the construction period.

[contact redacted]

8th January 2016

London & Northern Evidence
National Infrastructure Commission
1 Horse Guards Road
London
SW1A 2HQ

RE: Call for Evidence

The Multi-Disciplinary Activity Group for Use of Underground Space (MAG2US) is a recently formed group of professionals aiming to improve subsurface resource management and spatial development. In response to a call for evidence by the Infrastructure Commission we would like to submit evidence and views in response to the following questions:

- Connecting northern cities – potential needs and delivery constraints (question 4)
- London's transport infrastructure – opportunities to reduce the costs of London's transport infrastructure (question 3)
- London's transport infrastructure – opportunities for delivery of large-scale transport infrastructure improvements in London, including Crossrail 2 (question 4)
- London's transport infrastructure – international lessons (question 5)

Background

Underground space is a complex, scarce and valuable resource, particularly in urban areas where we are more reliant on using the subsurface for physical infrastructure such as utilities and transport, containment of resources (energy & water), and storage of waste. A lack of integrated above and below ground spatial planning is currently leading to increased pressures on the subsurface. Where optimal use of the space is not pursued, resource functions are not protected and land for future infrastructure is not safeguarded. Subsurface planning is therefore vital to ensure a coordinated approach is taken to the development of above and below ground spaces in our cities, particularly in order to support the needs of Nationally Significant Infrastructure Projects.

Given large-scale infrastructure projects have both a surface and subsurface expression, they provide the opportunity to demonstrate the benefits of new city data management tools, infrastructure mapping and integrated city modelling (e.g. Building Information Models - BIM). Integrating these approaches at an early stage, through demonstrator projects could act as a catalyst for more strategic use of the subsurface and more sophisticated spatial planning of our urban areas and making it nationally consistent.

Potential delivery constraints to new transport infrastructure

Mapping potential project constraints

Late stage awareness of physical constraints to planned infrastructure can be costly. In order to better understand what lies beneath the surface of cities better coordination is needed between utility providers, transport operators, property owners, land use planning authorities and other government institutions. The risk of large infrastructure projects needing to undertake physical detours to avoid constraints such as building foundations could be partly reduced by creating a shared database of geological conditions, existing public assets, planned infrastructure projects, and development opportunity sites in cities. The alignment of Crossrail was influenced by the need to avoid over 200 existing obstructions including building foundations and other underground rail lines. Meanwhile Crossrail2 is likely to be re-routed via Balham rather than Tooting because of geological concerns.

Safeguarding Directions are an important tool in helping to deliver major infrastructure projects, however they are not able to address existing, unknown subsurface conditions or take a holistic approach to management of underground spaces. Although some data pertaining to critical national infrastructure might need to be omitted from a public register of subsurface assets, an appropriately managed central resource of underground data could help avoid late stage amendments to infrastructure projects. One example is the amendment to the draft Thames Tideway Tunnel Development Consent Order, needed to reposition the proposed replacement Blackfriars Millennium Pier. Integrated infrastructure mapping by the Future Cities Catapult with the city of Manchester successfully demonstrates the benefits of partnership working across the utilities sector for more robust planning for infrastructure growth.

Current resources available through the British Geological Survey (BGS)

NERC's British Geological Survey (BGS) and the National Geoscience Data Centre offers a digital data platform and a national geological model to help identify potential risks to delivery of infrastructure and other development projects. This data includes geological maps, 3D models and borehole logs which are used to inform infrastructure planning and design. These data, include geological maps, 3D models and borehole logs which are used to inform infrastructure planning and design. Since 2009, the collection of over 1.3 million UK onshore borehole logs have been released in digital form free of charge through the BGS web site¹, with over 750,000 downloads in 2015. For geotechnical data a new platform has also been developed which allows online submission of digital data from new ground investigations to enhance national data holdings². Several governmental and infrastructure organisations (e.g. Environment Agency, Scottish Water, TfL, ARUP) have made a commitment to use these new digital services and submit geotechnical data collected as part of development works and infrastructure projects.

Adoption of these open-data protocols, whereby existing data is re-used and new data is submitted centrally, maximises past investments in ground works, reduces site investigation costs and de-risks future investments and should be a standard, contractual requirement for all infrastructure projects.

The BGS has also redirected its UK geological survey programme to develop the National Geological Model (NGM)³ an integrated set of 3D geological models at various resolutions that is

¹ <http://mapapps2.bgs.ac.uk/geoindex/home.html>

² <http://transfer.bgs.ac.uk/ingestion>

³ <http://www.bgs.ac.uk/research/ukgeology/nationalGeologicalModel/home.html>

the primary spatial knowledge-base on the UK's geology. The BGS are adopting a digital approach to facilitate effective opening-up and sharing of the national geological model and underpinning datasets that is efficient and economically viable⁴. All outputs from the National Geological Model are compatible with BIM software⁵ and digital-services have been developed for the collation, display, filtering and editing of a range of data relevant to infrastructure projects. The NGM and supporting web-services, provide access to nationally consistent, expert geological understanding to support initial infrastructure feasibility and design and de-risk investment.

Opportunities for reducing the cost of transport infrastructure projects

Land acquisition & sub-surface development

One of the most significant costs associated with the delivery of major infrastructure projects is for the compulsory purchase of land. Although a £50 flat rate has been accepted as the nominal value payable for acquisition of subsoil earth needed for tunneling, increasing property prices, particularly in London are influencing the perceived value of subsurface space. The High Speed 2 project recently faced challenges from 204 parties who claimed that £50 was an insufficient payment for the subsoil, a number of respondents also sought confirmation of whether or not this policy would restrict their own subsurface developments, such as basement developments. The London Borough of Camden noted this as a particular issue in their area. Although the London Borough of Camden and several other London boroughs are developing planning policies to address the phenomena of large scale basement development, these generally represent reactionary, localised attempts to manage the construction impacts of developing subsurface space, rather than addressing hydrological impacts or broader strategic urban needs⁶. With residential basement depths of up to 15m and commercial developments such as the Edwardian Hotel Leicester Square with five basement levels, there is a concern that the physical cost of acquiring or insuring against damage to private subsurface developments could add unnecessary costs to the delivery of infrastructure projects.

Value versus cost

However, it is not just about reducing costs on large scale transport initiatives, but also recognising the wider benefits associated with infrastructure development. Currently the Cost Benefit Ratio used to value infrastructure projects adopts a prescribed formula which is too narrow. In January 1997 the Parliamentary Office of Science and Technology released the Tunnel Vision report, which concluded that:

“tunnel proposals have to overcome a number of hurdles to be accepted, and often must rely more on public and political pressure than the 'objective' appraisal system of the DoT. A useful future policy option might be to seek a greater social consensus on what aspects of the environment and quality of life should be protected from the adverse effects of new infrastructure, and from here, identify cost-effective solutions”.

Major changes in the business case framework rules for infrastructure projects should be encouraged. Health benefits, carbon emissions and international city competitiveness are also important measures of the benefits associated with mass public transport infrastructure. Where projects are deemed viable, city governments and infrastructure providers also need to become better at capturing the resulting value. Upgrades to the London Underground and the

⁴ <http://www.bgs.ac.uk/research/environmentalModelling/groundhogDesktop.html>

⁵ <http://www.keynetix.com/bimforthesubsurface/>

⁶ [https://www.rbkc.gov.uk/pdf/Final Basements Policy Jan 2015 adopted web.pdf](https://www.rbkc.gov.uk/pdf/Final%20Basements%20Policy%20Jan%202015%20adopted%20web.pdf)

construction of Crossrail have acted as strong drivers for real estate development, but despite the recent introduction of a Crossrail Levy and Community Infrastructure Levy, there are too few mechanisms for harnessing the uplift in property values to help fund further necessary infrastructure development.

Opportunities for improving delivery of large-scale transport infrastructure improvements

Strategic planning and proactive governance of subsurface resources is needed in cities, particularly London, where competition for underground space and resources is most pressing. Such a plan would allow a more strategic approach to benefits, such as locations of housing developments, commercial or residential developments around new or upgraded stations, etc.

One of the key advantages of strategic planning is that it requires involvement of all relevant stakeholders. This opens the way for seeking new innovative solutions. Rather than using the subsurface either for transport or energy solutions, it could lead to a combined solution serving both. The same holds true for the question of how to develop public spaces below the surface. To really create a new urban tissue below the surface, public connectors need to be created. Planning also stimulates thinking about future uses. Creating space below the surface has to be appraised against a much longer time scale than surface development given the long life span of these spaces.

Ideas and lessons learnt from international case studies

British expertise in property, law, engineering, environmental management and construction is some of the best in the world and our expertise in delivering complex infrastructure projects is highly regarded, however lessons can still be learnt.

International case studies

It is our strong suggestion that major UK cities adopt a three dimensional approach to spatial planning. Internationally there are a number of initiatives to better understand, manage and develop the subsurface, including:

- Helsinki - Although it's geology and land tenure is very different to London's, Helsinki has a three dimensional spatial plan that coordinates, connects, safeguards and provides a framework for the use of 600 underground spaces for mostly public infrastructure. Planned and existing land uses of the subsurface range from public swimming pools to data centres (where less energy is needed to cool the equipment and the surplus heat generated is then used for residential heating).
- Kuala Lumpur - In 2007 The Stormwater Management and Road Tunnel (SMART) infrastructure project in Kuala Lumpur, Malaysia introduced an 9.7km long, underground roadway and storm water retention tunnel that is divided into three sections that can be collated to absorb urban flood waters.
- Tokyo - In 2007 Japan introduced the Deep Space Utilization Law to legalise the development of spaces at least 40 metres below ground level for public utility infrastructure. The most significant attribute of this law is that when a road, railway or water utility company for example wishes to build a tunnel at 40 meters or more under the

ground, they are not required to receive the consent of parties owning or renting the land above the tunnel, nor are they required to pay them any compensation.

- Singapore - the Urban Redevelopment Authority (URA) has proposed 29km of underground links to improve pedestrian access and reduce congestion at ground level. At 20 designated locations private developers can receive cash grants from the URA to reimburse the cost of constructing pedestrian walkways beneath their properties, with the spaces also being exempt from the usual caps on Gross Floor Area (GFA).
- Tianjin - Since 2004 Tianjin in China has carried out extensive research on the development and utilisation of underground space. This has resulted in a series of documents, including the 'Utilization of Underground Space Planning in Tianjin Central City (2011-2020)'. Research undertaken to inform the 2011 and other earlier plans included a comprehensive survey of existing underground spaces in Tianjin city central and the aim now primarily is to construct under-ground nodes to link primary subway stations and public centres for commercial and parking purposes.
- Montreal - Montreal's underground RESO network is a set of city-enabled, privately-developed underground connections that ties much of the city centre into a climate-protected, traffic-free and vibrant pedestrian zone.
- Arnhem & Zwolle - In the Netherlands, a new model of analysis has been introduced for urban and land planning in Arnhem. The plan consists of three layers: occupation (plot oriented developments e.g. housing and offices); network (functions such as road and rail infrastructure); and the underground (consisting of all subsurface functions e.g. storage of water). The City of Zwolle has created a 'Vision on the Underground of Zwolle'. This document comprises a complete analysis of the underground space beneath the city.

In May 2015 'Think Deep: Planning, development and use of underground space in cities'⁷, was published by the International Tunnelling and Underground Space Association Committee on Underground Space (ITACUS) and International Society of City and Regional Planners - the book contains five detailed international case studies.

Sub-Urban research project

In 2012, the British Geological Survey together with other geological surveys in northern Europe, put forward a proposal to the Transport and Urban theme of the European Cooperation in Science and Technology (COST). The proposal advocated for greater interaction and networking between experts who develop urban subsurface knowledge and those who can benefit most from it. One product of this research cooperation is the creation of 'Sub-Urban'⁸. Sub-Urban is a European network of Geological Surveys, Cities and Research Partners working together to improve how we manage the ground beneath our cities. Glasgow is the UK's representative city in Sub-Urban and as such is already undertaking a number of applied research projects to investigate how their subsurface resources might be better used and managed. Initiatives include city subsurface spatial planning, integrated above-below ground BIM and heat extraction and storage through disused mines.

⁷ [ISBN: 978-94-90354-34-3](#)

⁸ <http://sub-urban.squarespace.com>

Conclusion

In summary, MAG2US would encourage the Infrastructure Commission to work with city governments to promote the importance of strategic planning and safeguarding of subsurface resources, in order to reduce risks to the cost and delivery of future infrastructure projects. Should the Infrastructure Commission or other government agencies require further advice or support regarding subsurface issues we would be happy to contribute our expertise where possible.

With Regards,

Multi-Disciplinary Activity Group for Use of Underground Space

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Response to the National Infrastructure Commission

8 January 2016

1. Summary

- 1.1 MAG welcomes the opportunity to make initial comments to the National Infrastructure Commission on the first two elements of its consultation: Northern Connectivity and London's Transport System.
- 1.2 The NIC has a key role to play in fully assessing the network of transport assets across the UK, the way they should be connected and how they will drive growth in the UK economy over the coming decades. To do that, a comprehensive look at the current and potential economic contribution of integrating road, rail and air connectivity is essential. While there are significant gaps in the evidence, modelling tools developed for the Airports Commission will enable the NIC to undertake this work.
- 1.3 On Northern Connectivity, the Commission must ensure that its plans focus not just on city to city connectivity but on the creation of an efficient transport network which integrates opportunity for international connectivity via the North's global gateway, Manchester Airport. It must also prioritise the development of east-west connectivity through the Northern Powerhouse Rail (NPR) network and high speed rail.
- 1.4 On London's Transport System, MAG is a supporter of Crossrail 2 and worked with stakeholders to promote its development. The need for enhancement of the West Anglia Main Line (WAML) is, however, already critical and must not be delayed until the arrival of Crossrail 2 in 2030 to deliver them.
- 1.5 We urge the NIC to recommend a phased delivery of enhancements to the West Anglia Main Line, ensuring the benefits of step-change improvements to services are realised ahead of Crossrail 2.

2. Introduction

- 2.1 Manchester Airports Group (MAG) owns and operates four airports in the UK (Manchester, London Stansted, East Midlands and Bournemouth), handling some 50 million passengers per annum. Our airports are nationally significant infrastructure assets, providing essential connectivity both for the regions they serve and the wider UK economy, contributing over £4 billion in GVA each year.
- 2.2 Aviation is a key driver of economic growth, creating jobs and facilitating trade. The sector contributes over £50bn to the UK economy and supports more than a million jobs directly. Airports, as the physical infrastructure that underpins the sector, should be considered vital national assets and therefore fully integrated into any national infrastructure plans set out by the Commission in due course.

- 2.3 While airports invest heavily in their own infrastructure, failure to meet the wider surface access needs of passengers wishing to travel seamlessly for business or leisure will limit connectivity and hamper growth. Road and rail access to UK airports very often defines both their catchment area for potential passengers and, in turn, their competitive position in attracting new airlines.
- 2.4 Investing in these schemes, therefore, that connect cities with major airports as well as each other, may stimulate stronger growth as well as greater regeneration potential. It will enable the most productive use of spare capacity and connectivity from all UK airports, inducing a catalytic effect for the regional and national economy.
- 2.5 The National Infrastructure Commission (NIC), therefore, has a key role to play in fully assessing the network of transport assets across the UK, the way they should be connected and how, in doing so, these assets will drive growth through better productivity and more effective utilisation. In assessing the UK's infrastructure investment priorities and enabling the integration of those spending plans, the NIC will address a long-term weakness in UK infrastructure planning. Too often, a siloed, project by project approach to capital investment has failed to harness the true value of the UK's network of infrastructure assets.
- 2.6 By taking a comprehensive look at the kind of connectivity the UK needs and ways of supporting more effective network planning for domestic transport infrastructure, the NIC will be in a position to co-ordinate the investment programmes required to get there. This consideration must, as a matter of course, include airports, airspace and air freight.
- 2.7 We believe there is currently a significant gap in the evidence base for this work. The dominant focus of the Airports Commission was to consider the most appropriate location for new runway capacity in the period to 2030. For example, the AC did not assess in any detail the future growth scenarios at other major UK airports, including Manchester and London Stansted. As such, we believe there is a need for the NIC to take a more broadly focussed analysis of the economic potential of a wider range of UK airports and the infrastructure required to support their growth.
- 2.8 Furthermore, although the Airports Commission identified short term priorities in its interim report, a number of its key recommendations have not been addressed by Government. We would encourage the NIC to look again at these issues and come to its own views on the strategic importance of the AC's recommendations.
- 2.9 The Commission's initial focus on Northern and London connectivity is naturally an area of considerable interest for MAG. As we have not yet had the opportunity to meet with the Commission or secretariat to discuss areas of most interest to MAG, we would be happy to provide further information at a later date, as appropriate. We are pleased,

therefore, to offer our initial views to the Commission as part of this consultation and would welcome the opportunity for further engagement over the coming months and years.

2.10 This response is focussed on the first two elements of the Commission's consultation.

3. Northern connectivity

- 3.1 Manchester Airport is the global gateway for the North of England and the largest UK airport outside London. The airport supports 21,500 on-site jobs and contributes £918million in GVA to the UK economy each year, of which £627m benefits the North West alone.
- 3.2 Currently, Manchester has more than 75 airlines operating to around 200 destinations worldwide. With runway capacity to serve 55 million passengers a year, it currently serves around 24 million with a strong mix of full service, charter and low-cost operators. This range of services and carriers caters for both tourist and business travellers, while handling over 100,000 tonnes of exports each year.
- 3.3 Over the last decade, Manchester Airport has been successful in bringing more direct, long haul services to the North of England, including to Dubai, Abu Dhabi, Qatar, Hong Kong, Singapore, New York, Washington and Chicago. In 2016, services to Beijing, Los Angeles and Boston will commence. In most cases, Manchester is the only UK airport north of London offering these routes.
- 3.4 MAG has recently announced its intention to invest £1bn in the Manchester Airport Transformation Programme. Over the next 10 years the airport will benefit from an overhaul of its terminal and other passenger facilities, introduce new technologies and improve access to the airport.
- 3.5 The £800m Airport City project is also being developed next to Manchester Airport's terminals and sits at the heart of Greater Manchester's Enterprise Zone. It aims to attract global businesses to the region, especially those that would benefit from having close access to both the airport's route network and its road and rail connections with the rest of the North and beyond.
- 3.6 The lure of these factors has already led to companies like DHL and Amazon announcing plans for major logistics operations at Airport City, helping to meet the project's target to create more than 10,000 jobs over the next decade. Its success hinges on two factors. The first of those is Manchester Airport's ability to continue to secure new long haul passenger and cargo services of relevance to potential occupiers. The second is being able to link to a modern and efficient ground transport network that would serve the logistics needs of businesses basing themselves there at the same time as enabling as many people as possible to access the jobs being created.
- 3.7 In many ways, the factors that will drive the success of Airport City also demonstrate Manchester Airport's ability to help drive the success of the Northern Powerhouse. MAG is committed to investment in the region and helping to rebalance the UK economy but Manchester Airport has the potential to play an even greater role and

there are steps the Government must also take to unlock that potential as soon as possible, to the benefit of the North and the wider UK.

The power of connectivity

- 3.8 It is not new to observe that businesses need connectivity to succeed. They rely on having good access to skills, supply chains and markets – both domestic and international. Poor transport links can, therefore, be an obvious barrier to success. Poor facilities, journey times, overcrowding and congestion affect the perception of proximity, reliability and easy access, which are vital issues for businesses, investors and tourists alike.
- 3.9 The area widely recognised as constituting the ‘Northern Powerhouse’ – covering the cities of Newcastle, Sheffield, Leeds, Manchester and Liverpool – is smaller in size than Beijing. However, its competitiveness – both domestically and internationally – is being significantly hindered by poor transport links, most notably from east to west.
- 3.10 Centre for Cities research shows that over the 10 year period from 2004, northern cities have had lower GDP per capita, fewer business start-ups, lower employment rates and lower population growth than the South East. For every 12 new jobs in the South, just one was created in the rest of Britain and seven of the ten cities/towns experiencing the lowest growth were in the north of England.¹

Rail access and the North

- 3.11 Compared to London and its commuter hinterland, existing rail services across the North are slow and without the required frequency, either for freight or passengers. This is constraining the development of new businesses and trade across the region, not least as people find it difficult to travel from one area to another and companies find it difficult to trade goods and services across the country.
- 3.12 One illustration of the way in which transport connectivity is serving the North poorly is commuting patterns, with between 85-96% of working people in the Northern Powerhouse cities live and work in the same city region. Fewer than 1% of people living in either Manchester or Leeds commute between the two cities, despite being just 36 miles apart. This lack of labour force mobility is emblematic of the poor connectivity between the major conurbations and must be addressed. Transformational performance improvements can only be delivered through transformational investment; an incremental approach will not achieve the step-change in performance that the Northern Powerhouse needs to become a reality.
- 3.13 Equally, access to Manchester Airport as the North’s only true global gateway is key to improving its trade, tourism and inward investment prospects. Long journey times to Manchester Airport limits the extent to which its connectivity delivers benefits to the

¹ Rochdale, Blackpool, Hull, Grimsby, Huddersfield, Wigan and Burney

region: businesses and passengers cannot reach the airport quickly or efficiently enough; and airlines cannot access large enough catchments to make new services viable. This, in turn, severely hinders the geographic spread of economic benefits from Manchester Airport's connectivity.

- 3.14 Put simply, better connections and vastly reduced journey times across the North would, therefore, have a transformative impact on the airport's competitiveness by simply bringing Manchester Airport's global connectivity closer to all Northern cities.
- 3.15 We strongly support Transport for the North's approach to these issues, which recognised in its interim report, published in November 2015, that the initial focus of its work around the 'Northern Powerhouse Rail' network was *'developing the case for substantially improved connectivity between the main cities of the North, and between these and Manchester Airport'*.
- 3.16 Widening the airport's catchment area in this way would improve its ability to attract new airlines and secure more direct and more frequent long-haul services to key overseas markets. That, in turn, would enable the economic/trade benefits associated with access to key global markets to be spread to a much greater area across the North. **Therefore, the Commission must ensure that its plans focus not just on city to city connectivity but on the creation of an efficient transport network which integrates rail and air, maximising the potential for the new Northern economy to maximise its potential internationally as well as domestically.**
- 3.17 Currently, access to the airport is primarily by road, rail and Metrolink tram services. Users of the latter two modes of transport are typically from the local catchment area rather than further afield, as current rail services often do not provide attractive options for passengers from the wider region. That is mainly due to long journey times, lack of frequency or the absence of a direct service. However, there is widespread demand for improved connectivity to the airport, as illustrated by the positive reception received by the announcement of new services as part of the recent TransPennine and Northern Rail franchise agreements.
- 3.18 The scale of the opportunity for transport accessibility can best be illustrated by the increase in total passenger catchment within two hours of the airport by public transport that would result from the delivery of high speed rail across the North. Current, limited, rail access to the airport – particularly west to Liverpool and North Wales – means the population within that catchment stands at around 8 million. We estimate that with the right East-West rail services (HS3) this could leap to 18 million and support new air services to a wide variety of new long haul markets. With further improvements to road and rail, this would only increase further.

High Speed Rail

- 3.19 MAG has consistently supported the development of high speed rail and we welcome further commitments by HS2 Ltd and the Secretary of State in December to developing a station stop at Manchester Airport in Phase 2b. Integrating the airport into the high speed network is important to the long term success of the Northern economy, increasing the number of people able to access its services and stimulating growth through competition with airports in the South East.
- 3.20 Further high speed rail from east to west (HS3), however, would have truly transformative impact on connectivity. With HS2 and HS3 together, there lies the potential to close the productivity gap between the North and South, which Treasury has estimated would equate to in excess of £40 billion additional GVA by 2030. Together they have the potential to reduce journey times to Manchester Airport by around 50% across the North and Midlands – effectively bringing key cities twice as close as they are today.
- 3.21 Initial work by Network Rail and HS2 Ltd last year has shown that dramatic improvements are indeed possible between Manchester and Leeds city regions, for example – making a journey time of 26-30 minutes comparable to Crossrail's connection between Heathrow and Canary Wharf – that can only serve to drive trade and labour movement between the regions. Connecting HS2 and HS3 with Manchester Airport would provide excellent connectivity for air passengers across the North and Midlands, connecting quickly the wider economic region to global markets and providing a complementary counter-weight to the London/South East economy.
- 3.22 MAG believes that development of east-west connectivity should be a priority for the NIC's work. Further, we agree with the Airports Commission recommendation that more weight should be given to the specific needs of air passengers when developing strategies for the UK's rail network.**

Economic benefit analysis

- 3.23 We anticipate that a key focus for the NIC will be to develop evidence to quantify the economic benefits associated with the infrastructure proposals that it considers. An important element of this for Northern Powerhouse Rail (NPR) will be to understand the wider economic benefits that would be generated by better city-to-city connectivity, and also by better connectivity to Manchester Airport from across the region.
- 3.24 NPR will expand the airport's catchment by improving access to key population centres across the North, and significantly increase the number of air passengers within the airport's two-hour isochrone. Airlines will respond to this expanded passenger market by launching new routes to previously unserved destinations as they become commercially viable.

- 3.25 Enhanced international connectivity from the North will generate significant wider economic benefits for the regional economy, particularly in terms of improved productivity and improved access to global markets. Assessing the value of these connectivity benefits should be a key priority for the Commission in its assessment of the NPR business case.
- 3.26 The Airports Commission recently modelled the value of the connectivity benefits associated with options for new runway capacity at Heathrow and Gatwick. The AC's work on these issues would provide the NIC with a ready-to-use suite of models to assess the aviation-related economic benefits associated with NPR and surface transport improvements for other airports.
- 3.27 The output from the AC's models would also provide the NIC with a consistent approach to valuing such benefits, and give the Government a more complete assessment of the economic benefits associated with airport growth over the coming decades. Following the Commission's initial report to the Chancellor in March 2016, we would encourage the Commission to address these issues in further detail for all major UK airports.

4. London's transport system

- 4.1 The Mayor of London and Transport for London have estimated London's population will increase by almost three million over the coming decades, reaching 11.3million by 2050. This will present significant economic and social challenges, particularly in terms of housing and jobs. The London Mayor's 2050 Infrastructure Plan identifies east London as a key area for economic development to accommodate this growth and the East of England is currently one of the fastest growing UK regions – it too will see a dramatic growth in population and economic output.
- 4.2 Transport schemes that improve cross-city access for North and East London are essential for linking new homes in the Capital's opportunity areas with jobs and services. For businesses, too, gaining access to a larger talented labour pool will facilitate increased growth and economic productivity.
- 4.3 Crossrail 2, for example will enable businesses like Stansted Airport to draw on a new labour market and tap in to demand for business and leisure travel. Economic and population growth is, naturally, one of the many drivers of passenger demand (forecast to increase by up to 3% per annum to 2050), which will inevitably place a strain on all London airports over that period.
- 4.4 So for London's airport capacity, it is essential to learn lessons from Heathrow's decade of capacity constraint. It is vital that, without revisiting the work of the Airports Commission, the National Infrastructure Commission develops a full understanding of aviation demand in the South East and recommends proposals to government that will look at medium and long term requirements for the sector.
- 4.5 Even being optimistic, it is likely to be 15 years before any new runway capacity is developed in the South East. London Stansted serves more than 22 million passengers per annum, predominantly through the provision of services with low cost carriers and charter airlines, but has existing capacity to support growth to 45 million passengers.
- 4.6 Making the most productive use of this spare capacity will be vital to maintaining choice and value for consumers and developing the best possible connectivity for the UK economy and to support this, the Airports Commission made clear recommendations for urgent improvements to Stansted's rail connections into London.
- 4.7 It recognised that only by improving journey times would it be possible to enlarge its catchment and improve services to key regeneration areas. Facilitating and capitalising on population growth in North and East London will enable Stansted to play a wider role in the London airports system.
- 4.8 Improved rail connectivity to London and Cambridge is critical to enable London Stansted to achieve its full potential. Doing so would provide passengers with greater

choice and competition and help to foster growth and regeneration along the London-Stansted-Cambridge economic corridor. The need for investment in the West Anglia Main Line (WAML) has also been acknowledged as a strategic gap in the rail network by Network Rail and we anticipate its inclusion in the Anglia Route Study, due imminently.

Integrating Crossrail 2 with a programme of WAML investment

- 4.9 MAG is a supporter of Crossrail 2 and has worked with TfL and other parties to promote its development. Careful consideration, however, must be given by the NIC to how the project is integrated into a wider programme of investment on the West Anglia Main Line. The need for enhancement of the West Anglia Main Line is already critical and cannot wait until Crossrail 2 is delivered in 2030 to deliver them. A phased approach to WAML improvements could see very significant improvements to service frequency, reliability and journey times over the intervening period and would dramatically contribute to the region's regeneration and economic growth, including through more productive use of Stansted.
- 4.10 We agree that a new rail link, enhancements to the infrastructure and a tunnel across London will deliver significant benefits for the rail network, the region and Stansted Airport. Crucially, it will free up space on the congested mainline into Liverpool Street, stimulate regeneration in key sites like the Lee Valley Opportunity Area, unlocking further jobs and homes and maximise the growth potential in the London-Stansted-Cambridge economic corridor.
- 4.11 For the airport, it will help to grow Stansted's catchment by improving travel times and accessibility to south west London, Surrey and beyond. It will also enable the airport to serve a greater share of the London market, both in terms of geography and the range of passenger services available, increasing choice and competition for consumers.
- 4.12 Prolonged underinvestment on the WAML has been a key factor in the decline in rail services to the East of England in recent decades. For example, journey times to the airport from central London are now up to 10 minutes slower than they were a decade ago. This deterioration in service has led to the share of Stansted's passengers using rail falling from around 30% in 2005 to 22% currently. More importantly, this deterioration in the quality of rail services has had a negative impact on Stansted's competitive position in the London airport market.
- 4.13 Evidence shows that poor performance and lengthy journey times deter passengers from using the airport and hold Stansted back from attracting new airlines. Strengthening the airport's rail connectivity is key to unlocking its potential as it will dramatically increase the catchment area for passengers into central London as well as support economic development and regeneration throughout North and East London, which is key to the Mayor of London's long term plans.

- 4.14 Faster, frequent and more reliable rail connectivity are key to attracting new airlines and passengers – diversifying the airport’s offer from low-cost European destinations to full service carriers offering competition on European routes and new long-haul destinations. This would foster competition with other airports and deliver economic benefits of growth across the region by making full use of Stansted’s spare runway capacity.
- 4.15 There is an urgent need for a major programme of enhancements to the WAML, which spans the short, medium and long term. This programme needs to be phased to deliver a step change improvement to journey times and reliability in the first instance followed by additional capacity and frequency to support economic growth and regeneration along the Upper Lee Valley over the long term.
- 4.16 While many of the longer term improvements on the WAML would be considered ‘large-scale’, such as four-tracking and Crossrail 2, in fact incremental and significant changes can be achieved more quickly and cheaply. In the short term, for example, improvements to timetabling emanating from the new East Anglia rail franchise and line speed enhancements in the medium term would see dramatic improvements in journey times and reliability for Stansted Express services over the next five years.
- 4.17 MAG has already completed detailed technical studies (in consultation with Network Rail, DfT and TfL) to develop an up to date assessment of the options for Stansted rail services and the WAML. It identified a strong business case for renewing the infrastructure to enable trains to operate at higher speeds along key sections of the line. Increasing speeds for the Stansted Express from 80 to 100mph would see journey times between the airport and London improved by eight to ten minutes, with corresponding time savings for commuters using services on the line, from Tottenham Hale in the south through to Harlow, Bishop’s Stortford and Cambridge in the north.
- 4.18 These faster trains would attract more passengers and widen Stansted’s catchment – increasing the number of potential passengers living within two hours of the airport by 7 million – taking the total to 22 million passengers. The present value of the additional fare revenue from these improvements is forecast to amount to more than £500million and deliver a benefit cost ratio (BCR) of 3.7 from investment of around £370million².
- 4.19 We believe it would be entirely feasible and appropriate for Government to commit now to delivering these essential line speed improvements early in CP6 and to take forward the planning and preliminary work for these enhancements during the remainder of CP5. This would require little or no up-front capital cost but would give certainty and confidence to airlines and stakeholders planning investment in the region.

² At 2014 prices, excluding optimism bias

- 4.20 Looking to the longer term, we have also campaigned in partnership with the London-Stansted-Cambridge Consortium, neighbouring local authorities and the West Anglia Task Force to bring forward investment in four-tracking the WAML as a precursor to the development of Crossrail 2. By delivering four tracking in the mid-2020s, this development would realise significant early transport benefits through a step-change in service frequency, journey times and reliability. For the wider London-Stansted-Cambridge Corridor, it would also support better regional connectivity by supporting additional inner suburban and regional rail capacity into central London.
- 4.21 **We urge the Commission to recommend that improvements to the WAML must be phased and delivered ahead of the delivery of Crossrail 2 and ensure the full integration of London Stansted Airport and Crossrail 2 services.**
- 4.22 In the round, for all future planning on rail, we agree with the Airports Commission recommendation that more weight should be given to the specific needs of air passengers when developing strategies for the UK's rail network.

Funding mechanisms

- 4.23 In light of uncertainty over the prioritisation and delivery of enhancements to the WAML, MAG has been considering ways to accelerate their delivery. As part of this work we have recently commissioned specialist consultants to explore and develop options that would enable third parties to fund and deliver the type of infrastructure enhancements envisaged for the WAML, drawing on the significant incremental revenues that would be generated as a result of the line speed enhancements.
- 4.24 As well as contributing to the Shaw Review of Network Rail, in which some of these issues are also being considered, we would be happy to share the conclusions of this work with the Commission once the study is complete. We anticipate this will be towards the end of January 2016 and would support the Commission's further consideration of these alternative options to facilitate this third-party investment. We suggest that a key requirement for these options will be that they should provide potential investors with a clear and easily understood template for investing in such infrastructure enhancements.

A SUBMISSION TO THE NATIONAL INFRASTRUCTURE COMMISSION CALL FOR EVIDENCE

Metrotidal Lower Thames Pool is an integrated infrastructure proposal that addresses two of the three national challenges identified in the call for evidence:-

London Evidence: Large-scale transport infrastructure improvements in London

Energy Evidence: Improving how electricity demand and supply are balanced.

The ten pages, accompanied by illustrations, address both challenges.

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2.6 Tunnel Transport services

2.7 Enabling Development

2.8 Environmental Benefits

2.9 Green-Growth

2.10 Agglomeration Benefits

1 INTRODUCTION AND EXECUTIVE SUMMARY

Metrotidal Lower Thames Pool integrates new flood defences for London with energy storage, a multi-modal tunnel, data storage, utility wayleaves and enabling development for 250,000 homes with corresponding employment. The integrated infrastructure provides economic growth without an associated increase in carbon audit. This green-growth is achieved through the integration of a flood defence system with a sustainable power plant that generates and stores zero-carbon energy for supply-on-demand. This offsets the energy demands of the new transport connectivity, led by rail, and the enabled development. The sustainable pool system includes energy-efficient data storage and distribution with an exceptionally low power usage effectiveness (PUE) and new utility wayleaves that serve the enabling development.

The result is full-spectrum enabling development in which housing, employment, energy, transport, data and utilities are fully integrated to generate green-growth benefits across the Greater Thames Estuary region.

2 THE METROTIDAL LOWER THAMES POOL AGENDA

2.1 Integration Benefits

The combination of the separate initiatives into a single, well-integrated infrastructure project reduces the planning overheads, construction costs and environmental impacts while increasing the net economic benefits, thereby producing integration benefits. Substantial integration benefits are realised by combining separate developments for new flood defence, a sustainable power plant, a Lower Thames Tunnel, data storage and utilities into one integrated system that supports growth across the Greater Thames Estuary region.

2.2 Flood defence

The Metrotidal agenda provides a new system of flood defence to protect London and the Thames Estuary from surge tides through to the 22nd century. The defences are provided in the form of a throttle working in tandem with flood storage capacity to reduce the level of an incoming surge tide. The throttle is located on the shipping channel and the associated flood storage is provided by a pool beside the Hoo Peninsula, with additional emergency storage across the marshes to the Isle of Grain.

The throttle has a weir and floodgates that admit water to the pool during the incoming surge and return it to the sea on the ebb tide. Existing monitoring systems provide over 24 hours advance-warning of the storm surge. This allows the pool to be drained during the preceding low tide and the floodgates closed to reserve the maximum flood storage capacity ahead of the surge tide. The variables of the incoming surge waveform and duration are recorded and analysed as the tide advances down the North Sea coast, enabling the most effective use of the available flood storage in the pool to be programmed before the storm surge arrives in the Thames Estuary. The level of the weir and area of the flood gates are then controlled to suit the programme. If additional storage is required in an emergency a weir and flood gates from the pool allows controlled flooding of the marshes beside the Isle of Grain.

The system is designed to allow the free movement of normal tides while restricting and limiting the incoming storm surge. The throttle and flood storage capacity of the pool then works in tandem with the existing Thames Barrier and capacity of the tideway to reduce the incoming peak surge. Accordingly the system protects all the flood risk areas upstream from the throttle including both the metropolitan areas and existing fresh water meadow habitats that remain at risk in the event of a surge under the current TE2100 proposals.

The flood risk to very substantial property, infrastructure and habitat assets upstream is reduced, enabling the Association of British Insurers (ABI) to redirect a proportion of the

premiums raised under the new Flood Re agreement towards funding the flood storage system. The balance of the flood defence cost can be made up by riparian rates and government grant comparable to that required for the TE2100 proposals. The flood storage pool impoundment doubles as a sustainable energy storage system and reduces the construction cost of the multimodal tunnel, consequently increasing the net economic benefits of the integrated system. The resultant net economic benefits are much higher than for the TE2100 investment programme, which addresses only the flood risks.

2.3 Sustainable Energy Storage

The Metrotidal agenda integrates flood storage and tidal power within the same impoundment, allowing the range within the impoundment to be pumped to treble the natural tidal range within the estuary. This allows the tidal power plant to increase peak output when required or store energy in the pool for delivery on demand. The energy for the pumping is provided by solar, wind and tidal power along with the forthcoming option of nuclear power from Bradwell in Essex. The solar energy is provided by floating arrays within the protection of the impoundment that generate up to 50MW per sq.km. The wind energy is provided from the London Array in the outer estuary and the tidal energy from the natural range at the throttle in the Thames generating power through turbines below the flood weir.

The combined solar, wind and tidal pumped-storage system can deliver sufficient energy to offset the energy demands of the multimodal tunnel and new rail systems, leaving surplus energy to be sold to the grid.

2.4 Lower Thames Tunnel

The Metrotidal agenda includes a multimodal, D2T2 Lower Thames Tunnel formed from a combination of cut-and-cover and immersed tube tunnel construction techniques. The costs

are reduced by maximising the proportion of cut-and-cover and minimising the length of the immersed-tube construction. For a Lower Thames Tunnel running between Leigh-on-Sea in Essex and Allhallows-on-Sea in Kent the pool impoundment reduces the cost of the tunnel by increasing the cut-and-cover approaches and reducing the length of immersed-tube tunnel across the remaining open tideway. The immersed tube tunnel sections are formed in a casting basin, towed into position and sunk into a prepared trench across the open estuary. There is sufficient width in Sea Reach to maintain port operations during the immersed tube tunnel construction.

Northern Portal Connections

The northern portals of the tunnel provide:-

- rail connections to the C2C services from Pitsea, the Southend Victoria services at Wickford and the Crossrail services at Shenfield
- a new chord at Shenfield to the Great Eastern Main Line
- road connection to the A13/A130 at Sadler's Hall Farm
- access to a new Southend Park-and-Ride bus service between Southend Eastern Esplanade and Leigh-on-Sea via the Pier, Western Esplanade, Chalkwell Esplanade and a new Leigh Esplanade that replaces the existing C2C tracks

Southern Portal Connections

The southern portal of the tunnel provides:-

- rail connection to the Isle of Grain Line, which is twin-tracked
- a new chord to the North Kent Line and Southeastern network services at Strood
- road connection to the A228/A229/A2

2.5 Data Storage and Utilities

The Metrotidal Lower Thames Pool system generates and stores energy by moving large volumes of seawater between the pool and the sea. Data storage centres require reliable, sustainable energy supplies and efficient cooling systems. Modern Tier 4 centres secure alternative energy supplies for resilience and aim to achieve the lowest power usage effectiveness (PUE: total facility energy divided by the IT equipment energy). Data storage centres also require substantial cooling loads to maintain a steady-state environment for the IT equipment.

The seawater of the Thames Estuary maintains uniform temperatures throughout the year, suitable for providing a steady-state environment for the IT equipment and since the sustainable energy system moves large volumes of sea water this can be used to serve the cooling loads of the data centre, thereby achieving an exceptionally low PUE. The range of sustainable energy supplies used for pumping the pool provides additional resilience for the data centre supplies. The transport connections from the portals provide utility wayleaves for distributing the data across the enabling development.

Utilities

Several existing utilities have key network connections that pass under the estuary not far from the line of the proposed tunnel. The immersed-tube tunnel cross-section includes passages for utilities with the benefit of access for maintenance and renewal. The transport corridors north and south of the tunnel provide routes for extending and connecting existing utility networks across the Thames Estuary region. The utility way leaves (broadband, communications, electricity, gas, mains water and other private-sector services) contribute to tunnel revenues.

The Hoo Peninsula in Kent is one of the driest areas of the country and has a distant fresh water supply, pumped from the Medway Valley. The Lower Thames Tunnel opens a new

water supply grid connection between South Essex and North Kent to provide a more resilient service with less pumping.

2.6 Tunnel Transport Services

The Lower Thames Tunnel provides the following new rail and road services:-

Crossrail Plus: The eastern limbs of Crossrail, to Shenfield in Essex and Abbey Wood in Kent, are linked to create the “Crossrail Plus” orbital system serving the Greater Thames Estuary and Central London. The new orbital rail route reconnects populations north and south of the Thames with existing and new stations becoming the foci for commercial and residential development. Crossrail Plus connects with HS1 at Stratford and Ebbsfleet thereby providing convenient connectivity to Northern Europe without requiring access into Central London.

Pitsea-Isle-of-Grain-Strood Shuttle: A rail shuttle service links the South Essex conurbation and the Medway Towns, with terminals at Pitsea, the Isle-of-Grain and Strood. The shuttle interconnects with Crossrail Plus at South Benfleet, Leigh-on-Sea, Allhallows-on-Sea, Stoke Harbour, Cliffe and Higham, the C2C services at Pitsea and the Southeastern Network at Strood.

Rail freight services: A rail-freight bypass to the east of London, via the new chord at Shenfield, opens a new long distance freight route between the Haven Ports, Thames Estuary and Channel Tunnel.

Road connections: The highway between the A13/A130 at Sadlers Hall Farm and the A228/A289 on the Hoo. A road-freight route between the Channel Ports and the eastern seaboard ports north and south of the Thames that avoids the congested M25/Dartford Crossing.

Southend Park-and-Ride: a new shuttle bus service between Southend Eastern Esplanade and Leigh-on-Sea Station Carpark via the Pier, Western Esplanade, Chalkwell Esplanade and a new Leigh Esplanade that replaces the existing C2C tracks

2.7 Enabling Development

Residential Development: Growth-zones for a projected 250,000 homes, including the Shelter Wolfson Prize 2014 Housing Scheme on the Hoo Peninsula, served by the stations of the Crossrail Plus orbital, the Pitsea-Isle-of-Grain-Strood Shuttle and the adjoining C2C and Southeastern networks.

Commercial Development: Office developments served by the stations of the Crossrail Plus orbital, the Pitsea-Isle-of-Grain-Strood Shuttle and the adjoining C2C and Southeastern networks.

Industrial Development: New industrial development on existing sites at the London Gateway Port, Basildon, Canvey Island, Isle-of-Grain, Kingsnorth, Hoo Junction and the Medway City Estate with convenient employee access provided by the Crossrail Plus orbital, Pitsea-Isle-of-Grain-Strood shuttle and the adjoining C2C and Southeastern networks.

Benfleet Esplanade: The existing station and rail tracks through Benfleet are replaced by a new 4-platform station and underpass beneath Benfleet Esplanade accompanied by commercial and residential development that restores South Benfleet to Benfleet-on-Sea.

Leigh Esplanade: The existing station and rail tracks through Leigh-on-Sea are replaced by a new 4-platform station and underpass beneath the existing station car park. This becomes the terminus of Leigh Esplanade, which runs on the line of the existing tracks through Leigh-

on-Sea to Chalkwell, accompanied by commercial and residential development that restores Leigh to being On-Sea.

Southend Park-and-Ride: Mixed use commercial development over the new station and underpass at Leigh-on-Sea to receive visitors arriving via the tunnel and its connections and distribute them to the attractions of the Southend seafront via the Southend-Park-and-Ride service. Along with the enhanced rail access Leigh-on-Sea becomes a principal portal for visitors to the Southend conurbation thereby easing traffic on the notoriously congested A13 and A127 arteries.

2.8 Environmental Benefits

The environmental impact of the pool is assessed in terms of the impacts on intertidal and low-lying freshwater habitats. The area of the pool occupied by the St. Mary's Marshes is already identified for managed retreat by the current TE2100 programme. The impact on the remaining intertidal area occupied by the pool are offset by the benefits from protecting intertidal areas upstream from tidal squeeze and large areas of low-lying freshwater habits from a storm surge. When the zero-carbon energy generated and stored by the system is taken into account the net environmental assessment is beneficial.

2.9 Green-Growth

The integrated infrastructure provides economic growth without an associated increase in carbon audit. This green-growth is achieved through the integration of a flood defence system with a sustainable power plant that generates and stores zero-carbon energy for supply-on-demand. This offsets the energy demands of the new transport infrastructure and enabling development. The sustainable pool system includes energy-efficient data storage and distribution with an exceptionally low power usage effectiveness (PUE) and new utility

wayleaves that serve the enabling development. The result is full-spectrum enabling development in which housing, employment, energy, transport, data and utilities are fully integrated to generate green-growth benefits across the Greater Thames Estuary region.

2.10 Agglomeration Benefits

New transport infrastructure creates an agglomeration benefit if the group economy exceeds the sum of the separate economies and the cost of the new transport links. Traditional agglomeration operates radially drawing satellite settlements into an ever expanding urban nucleus.

The economic history of London can be seen as a series of agglomeration benefits, first arising from London Bridge agglomerating the trade route of the Thames with a radial Roman road network, accelerated by development of the regions, expanding sea trade, subsequent bridges, docks, warehouses and offices, all in turn rapidly increasing the urban economy and drawing in yet more investment. After WW2 the relocation of the port and trade from the Thames Estuary led to the contraction and separation of the economies in Essex and Kent. The Thames Estuary, for centuries the main artery of trade uniting the region into a single riparian economy from Central London to the coast had become a barrier to growth. As a result there are latent agglomeration benefits to be realised simply by re-uniting the economies north and south of the Thames through improved transport infrastructure. A relatively modest investment in new connectivity provides a large agglomeration benefit across the Greater Thames Estuary region. The Metrotidal Lower Thames Pool provides the new connectivity and enabling development, placing emphasis on orbital connectivity rather than extending existing radials. The congestion of Inner London arteries is avoided while full use is made of the counter-cyclical commuting capacity, providing greater transport capacity for lower cost, thereby increasing the agglomeration benefits.

METROTIDAL

LOWER THAMES POOL

MARCH 2016

INTEGRATION BENEFITS

Flood Defence



Sustainable Energy Storage



Integrated Transport



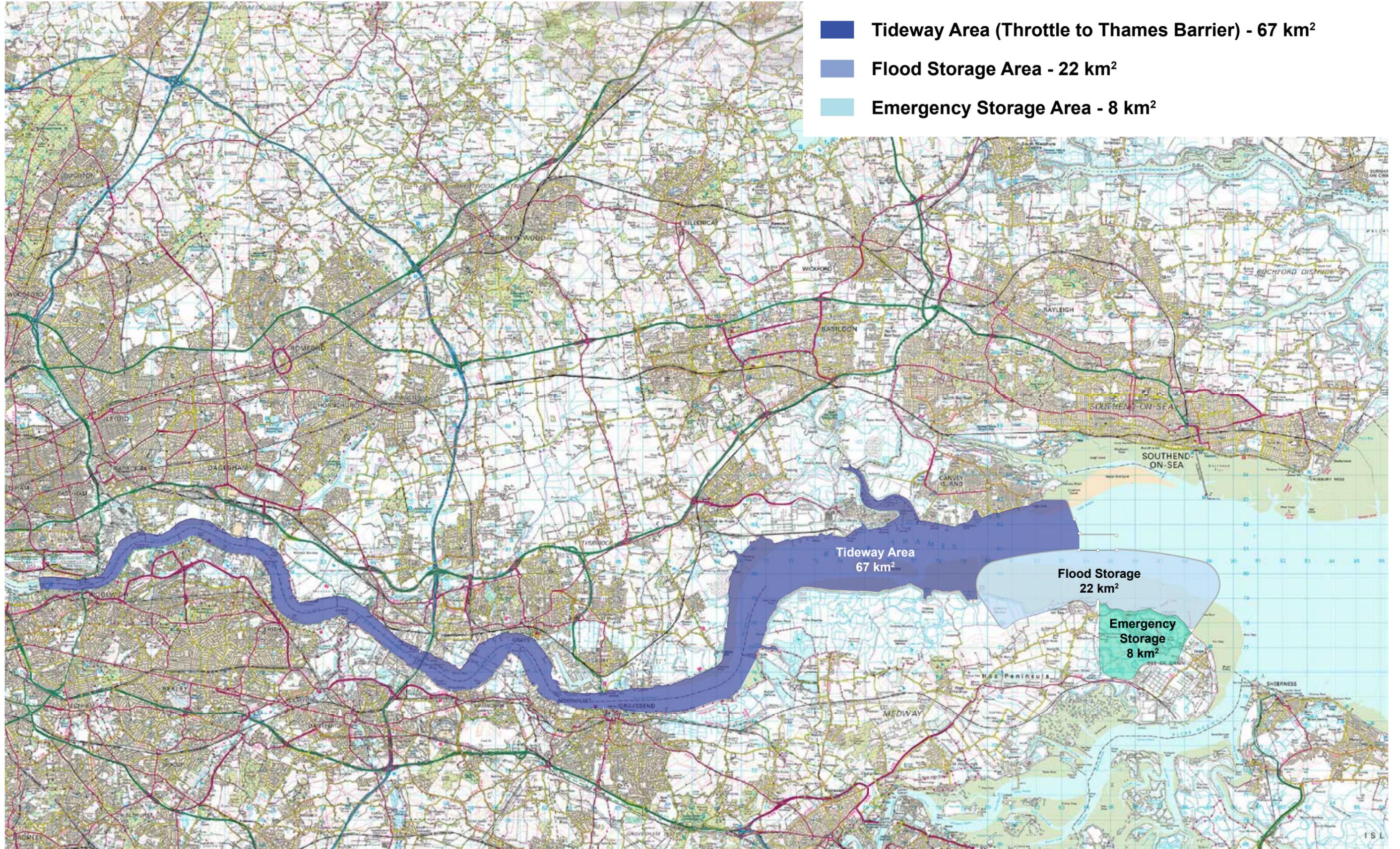
Data Storage and Utilities



Enabling Development

FLOOD DEFENCE

FLOOD STORAGE



SUSTAINABLE ENERGY STORAGE

SOLAR / WIND / TIDAL PUMPED STORAGE



INTEGRATED TRANSPORT

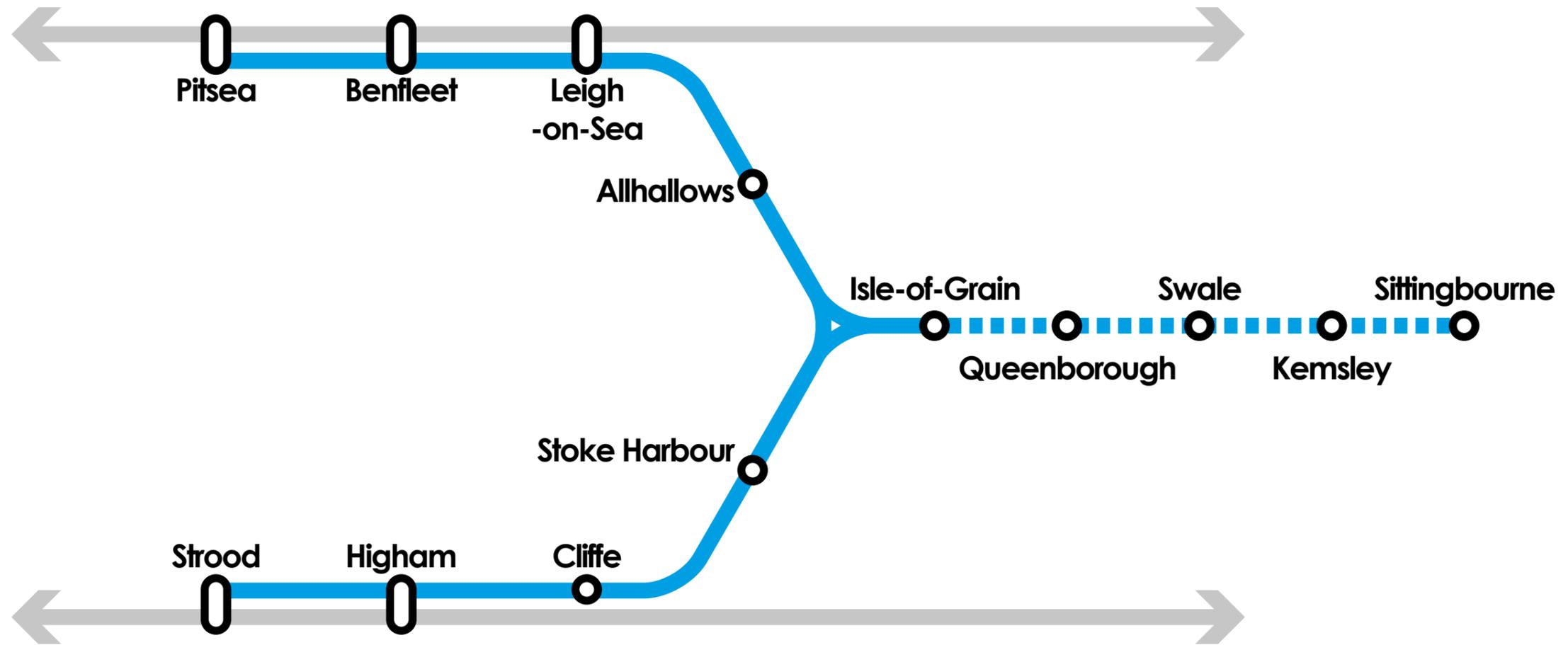
NEW RAIL CONNECTIONS

- CROSSRAIL PLUS
- PITSEA – ISLE-OF-GRAIN – STROOD SHUTTLE
- HS1
- - - 2040 ROUTES



INTEGRATED TRANSPORT

PITSEA – ISLE-OF-GRAIN – STROOD SHUTTLE



INTEGRATED TRANSPORT

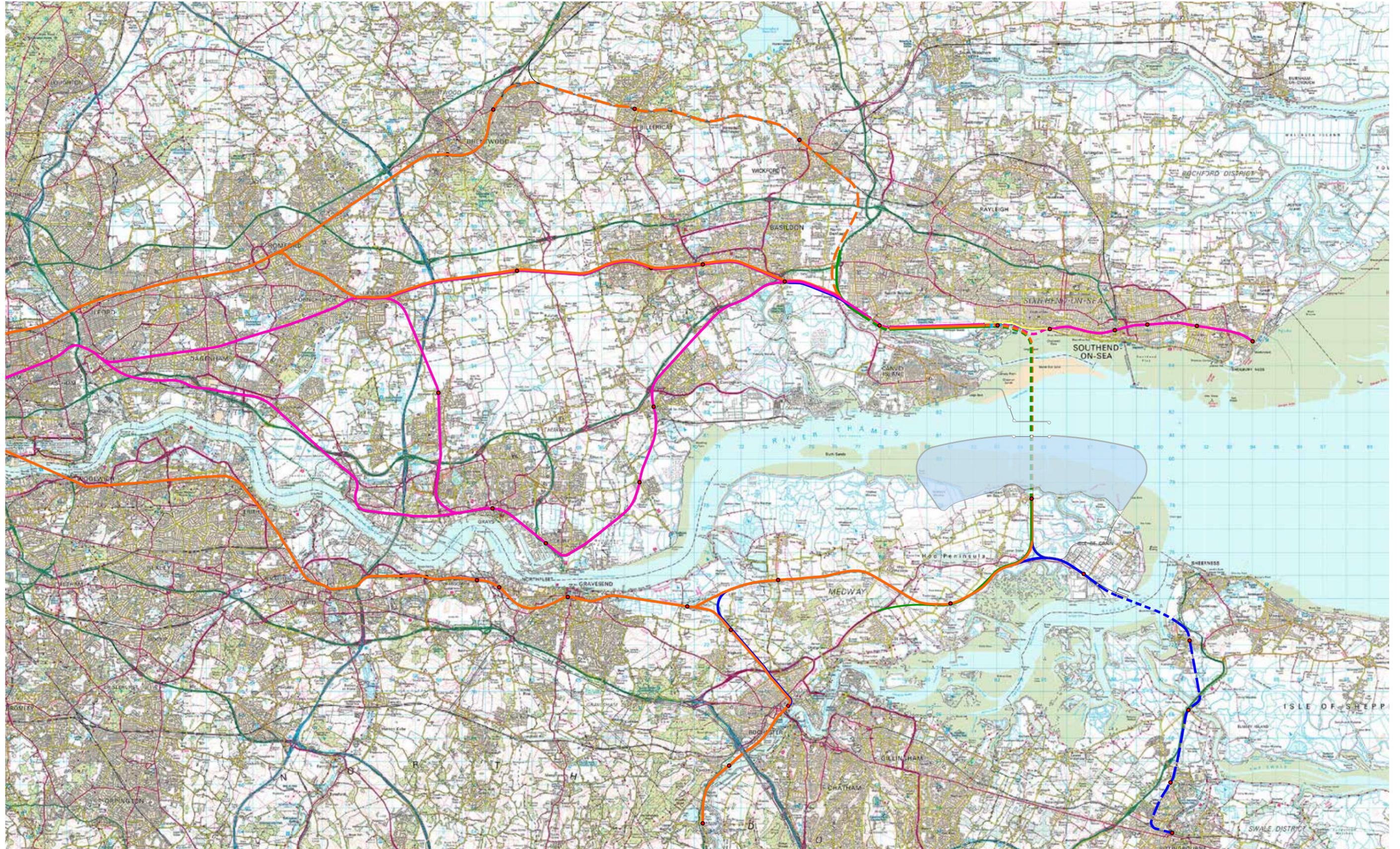
RAIL AND ROAD CONNECTIONS

RAIL CONNECTIONS

- CROSSRAIL PLUS
- PITSEA – ISLE-OF-GRAIN – STROOD SHUTTLE
- C2C
- HIGH SPEED 1

ROAD CONNECTIONS

- A13/A130 – A228/A289
- LEIGH ESPLANADE – CHALKWELL ESPLANADE



INTEGRATED TRANSPORT

RAIL AND ROAD CONNECTIONS

RAIL CONNECTIONS

- CROSSRAIL PLUS
- PITSEA – ISLE-OF-GRAIN – STROOD SHUTTLE
- C2C
- HIGH SPEED 1

ROAD CONNECTIONS

- A13/A130 – A228/A289
- LEIGH ESPLANAGE – CHALKWELL ESPLANADE

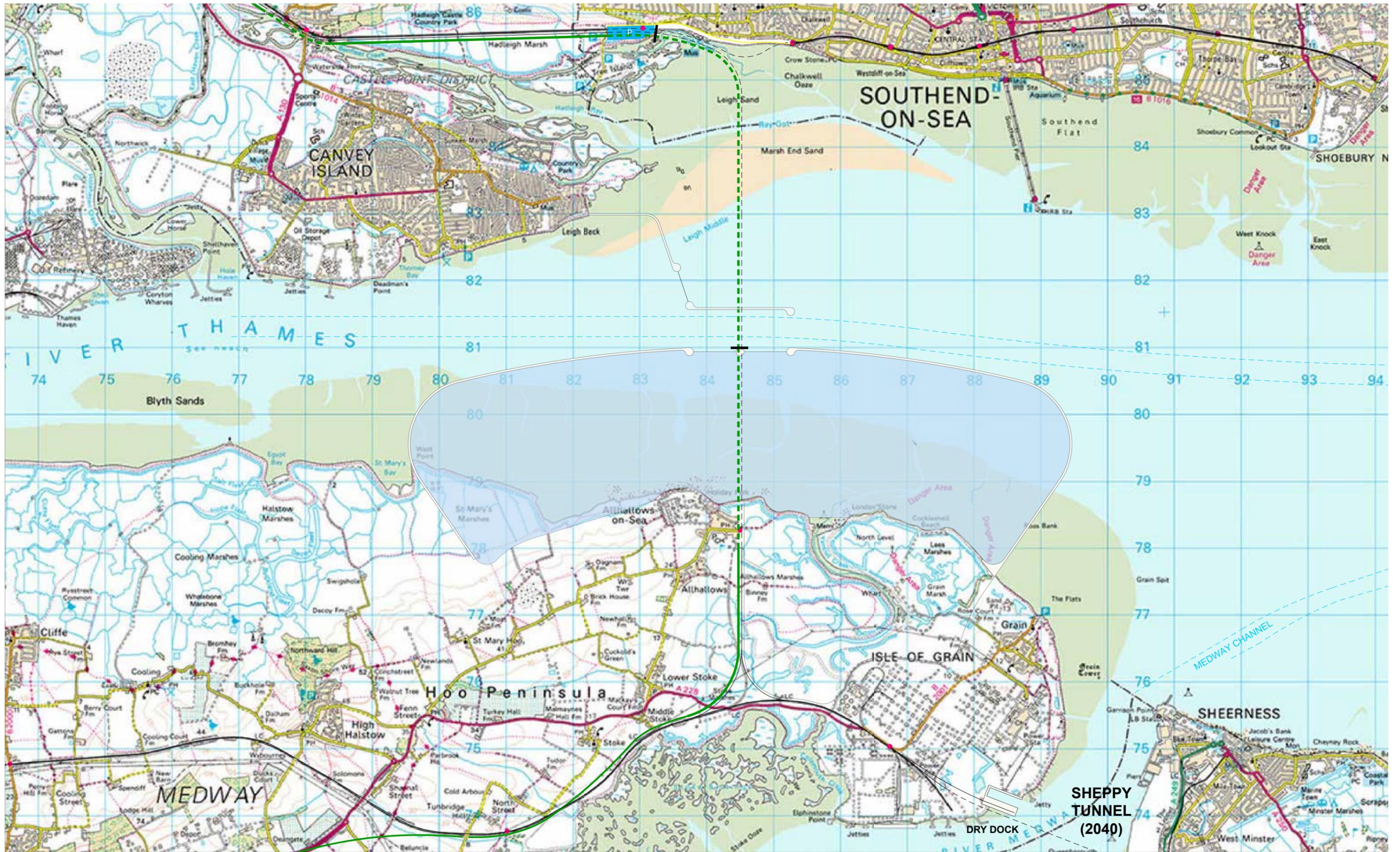


REGIONAL ROAD CONNECTIONS

-  MOTORWAYS
-  MAIN ROADS
-  METROTIDAL LINKS



TUNNEL CONSTRUCTION



TUNNEL CONSTRUCTION

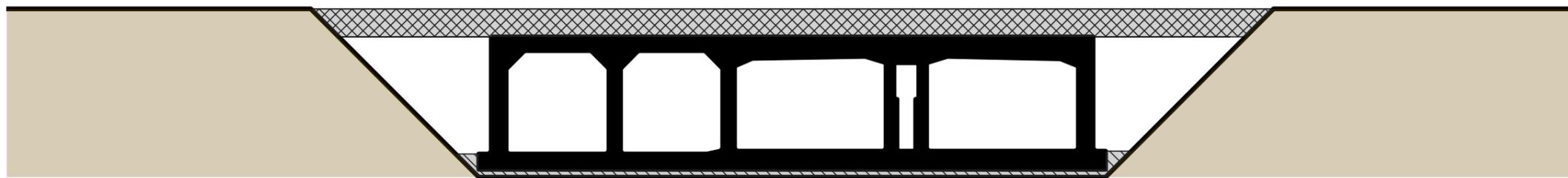
SHORTER TUNNEL OPTION



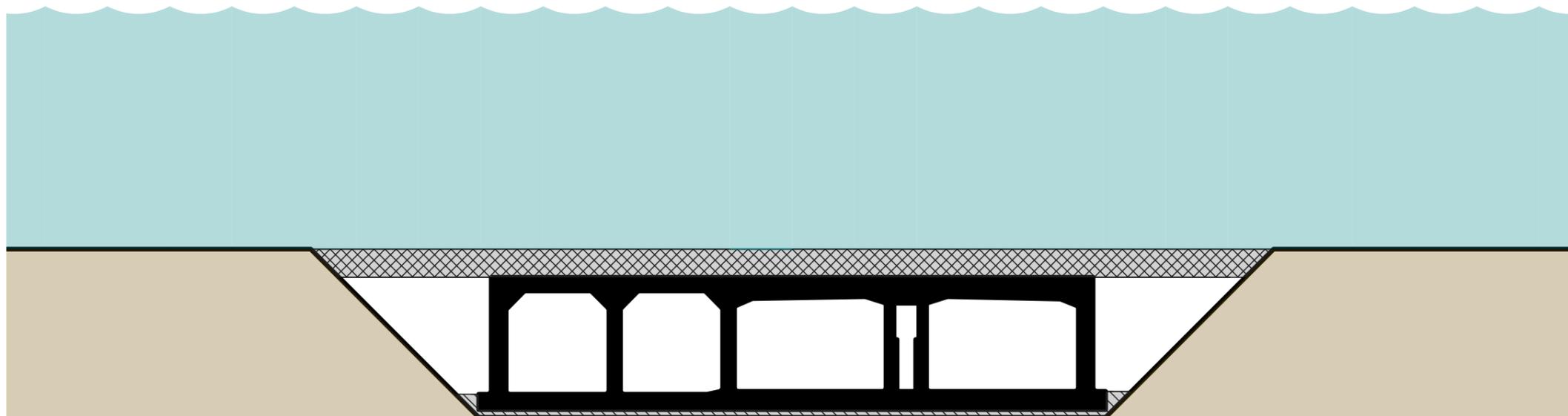
D2T2 IMMERSED TUBE TUNNEL



OPEN-CUT TUNNEL APPROACHES

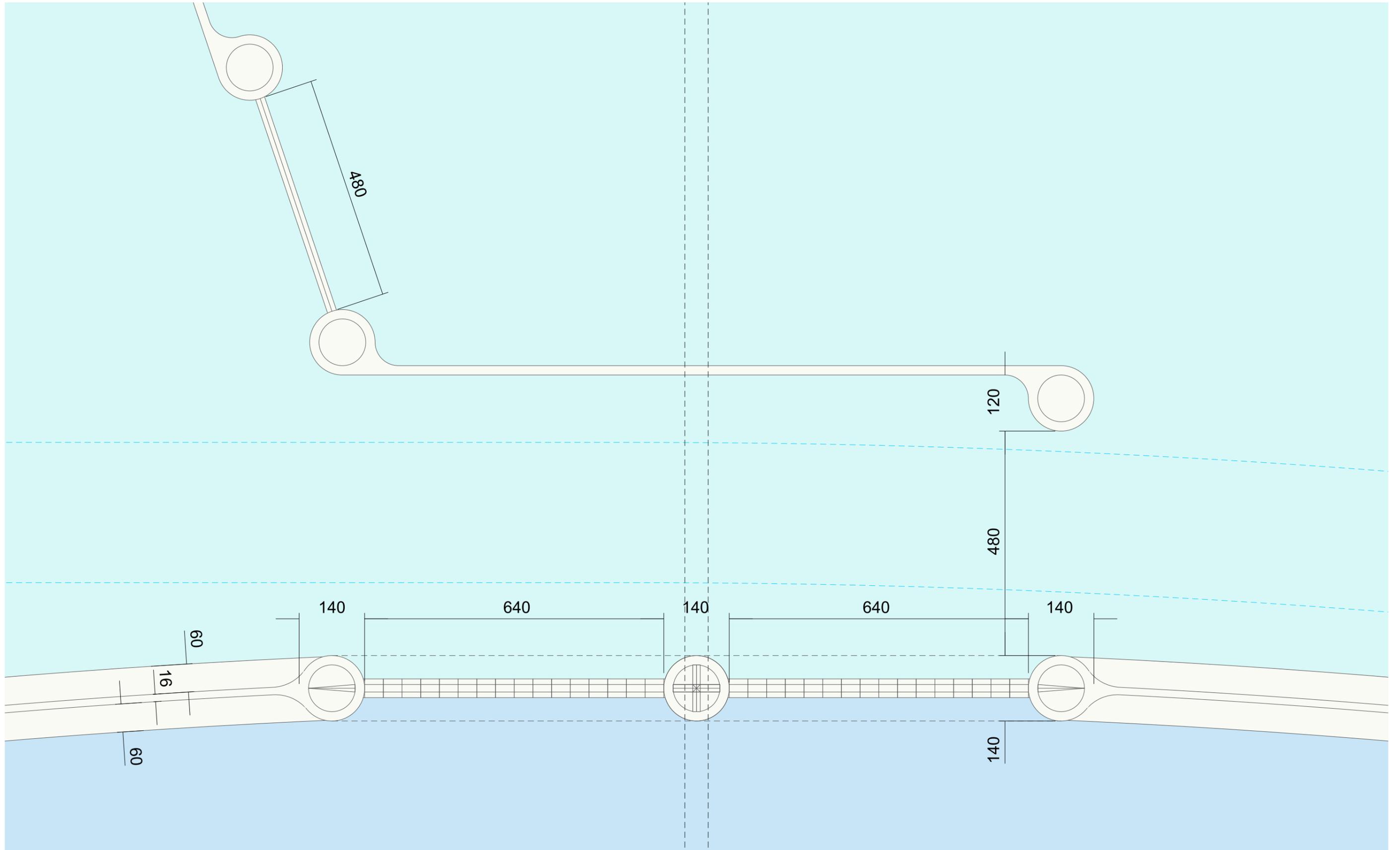


CUT-AND-COVER ACROSS INTERTIDAL AREAS



CUT-AND-COVER UNDER RIVER

THROTTLE DETAIL



DATA STORAGE AND UTILITIES

INFRASTRUCTURE UTILITY WAYLEAVES

 DATA STORAGE

 DISTRIBUTION



ENABLING DEVELOPMENT

STATION-FOCUS GROWTH ZONES



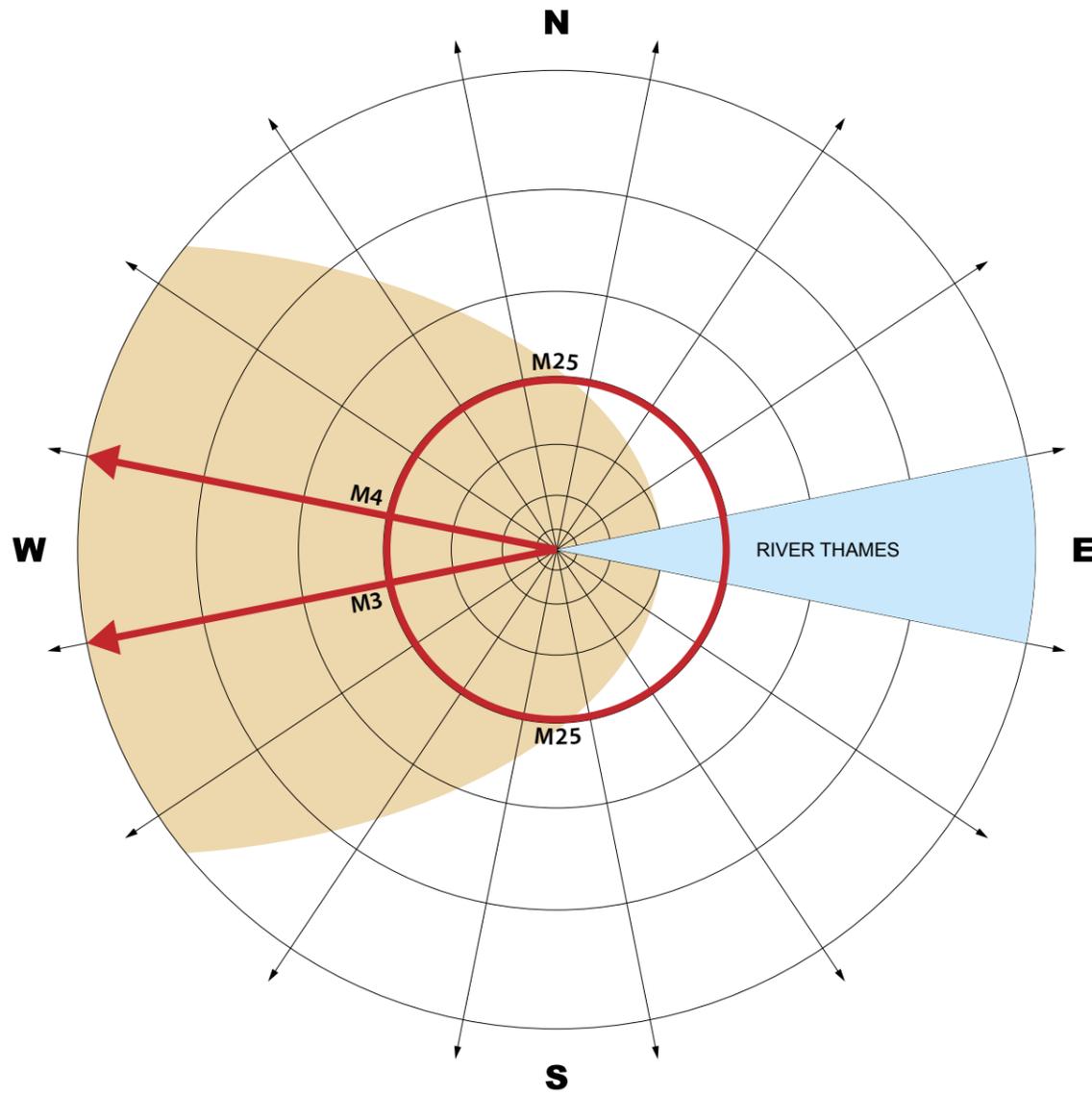
STOKE HARBOUR MASTERPLAN – HOO PENINSULA

SHELTER WOLFSON ECONOMICS PRIZE 2014 HOUSING SCHEME

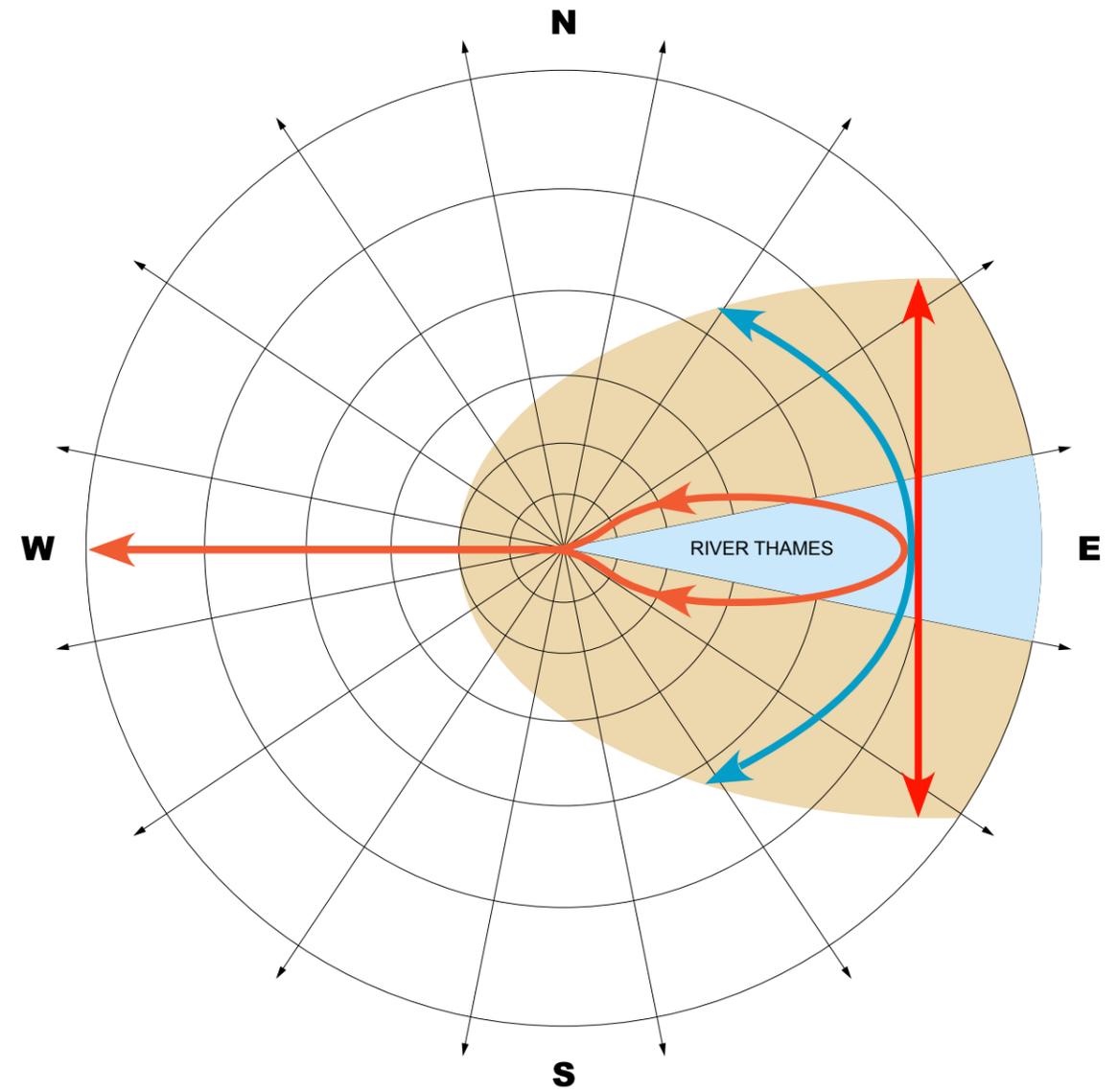


AGGLOMERATION BENEFITS

TRANSPORT NETWORKS AND GROWTH AREAS FOR LONDON



HISTORIC SYSTEM
GROWTH IN THE WEST



PROPOSED ADDITION
GROWTH IN THE EAST

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- 2 The Metrotidal Agenda**
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 - 2.5 Tunnel Connections
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 - 2.11 Green-Growth
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1 INTRODUCTION AND EXECUTIVE SUMMARY

Metrotidal Lower Thames Pool integrates new flood defences for London with energy storage, a multi-modal tunnel, data storage, utility wayleaves and enabling development for over 250,000 homes with corresponding employment. The integrated infrastructure provides economic growth without an associated increase in carbon audit. This green-growth is achieved through the integration of a flood defence system with a sustainable power plant that generates and stores zero-carbon energy for supply on demand. The sustainable energy offsets the demands of the new transport connectivity, led by rail, and the enabling development. The pool system includes energy-efficient data storage and distribution with an exceptionally low power usage effectiveness (PUE) and new utility wayleaves that serve the enabling development. The proposals also result in the construction of a valuable new deep-water dry dock on the Isle of Grain that is used to cast the Metrotidal Tunnel sections and the subsequent sections for the Sheppey Tunnel c2040.

The result is full-spectrum enabling development in which housing, employment, energy, transport, data, utilities and marine services are co-ordinated to generate green-growth benefits across the Greater Thames Estuary.

2 THE METROTIDAL LOWER THAMES POOL AGENDA

2.1 Integration Benefits

The combination of the separate initiatives into a single, well-integrated infrastructure project reduces the planning overheads, construction costs and environmental impacts while increasing the net economic benefits. Substantial integration benefits are realised by combining separate components for flood defence, sustainable energy storage, multimodal tunnel, data storage and utilities into an orbital network that supports growth across the Greater Thames Estuary region.

2.2 Flood defence

The Metrotidal agenda provides a new system of flood defence to protect London and the Thames Estuary from surge tides through to the 22nd century. The defences are provided in the form of a throttle working in tandem with flood storage capacity to reduce the level of an incoming surge tide. The throttle is located on the shipping channel and the associated flood storage is provided by a pool beside the Hoo Peninsula, with additional emergency capacity across the marshes to the Isle of Grain.

The throttle has a weir with deep-water flood sluices that admit water to the pool during an incoming surge and return it to the sea on the ebb tide. Existing monitoring systems provide over 24 hours' advance-warning of the storm surge. This allows the pool to be drained during the preceding low tide and the flood sluices closed to reserve the maximum flood storage capacity ahead of the surge tide. The variables of the incoming surge waveform and duration are recorded and analysed as the tide advances down the North Sea coast, enabling the most effective use of the available flood storage in the pool to be programmed before the storm surge arrives in the Thames Estuary. The level of the weir and area of the flood sluices are then controlled to suit the programme. If additional flood storage is required in an emergency a weir and flood sluices from the pool allow controlled flooding of the marshes beside the Isle of Grain.

The system is designed to allow the free movement of normal tides while restricting and limiting the incoming storm surge. The throttle and flood storage capacity of the pool then works in tandem with the capacity of the tideway upstream and the existing Thames Barrier to reduce the incoming peak surge. Accordingly, the system protects all the flood risk areas upstream from the throttle including the metropolitan areas and the existing fresh water habitats that remain at risk in the event of a surge tide under the current TE2100 proposals.

The flood defence proposals replace those of the TE2100 programme for which current budget is £1.5bn by 2034. The flood risk to very substantial property, infrastructure and habitat assets upstream is reduced, enabling the Association of British Insurers (ABI) to redirect a proportion of the premia raised under the new Flood Re agreement towards funding the flood storage system, so that government expenditure for the flood defence component will be less than the current £1.5bn budget. The flood storage pool impoundment doubles as a sustainable energy storage system and reduces the construction cost of the multimodal tunnel, consequently increasing the net economic benefits of the integrated system. The resultant net economic benefits are much higher than for the TE2100 investment programme, which addresses only the flood risks.

2.3 Sustainable Energy Storage

The Metrotidal agenda integrates flood storage and tidal power within the same impoundment, enabling the range within the impoundment to be pumped to treble the natural tidal range within the estuary. This allows the tidal power plant to increase peak output when required or store energy in the pool for delivery on demand. The energy for the pumping is provided by solar, wind and tidal power along with the forthcoming option of nuclear power from Bradwell in Essex. The solar energy is provided by floating arrays within the protection of the impoundment that generate up to 50MW per sq.km. The wind energy is provided from the London Array in the outer estuary and the tidal energy from the natural range at the throttle in the Thames generating power through turbines below the flood weir.

The combined solar, wind and tidal pumped-storage system can deliver sufficient energy to offset the energy demands of the multimodal tunnel and new rail systems, leaving surplus energy to be sold to the grid.

2.4 Lower Thames Tunnel and Sheppey Tunnel

The Metrotidal agenda includes a multimodal, D2T2 Lower Thames Tunnel formed from a combination of cut-and-cover and immersed tube tunnel construction techniques. The costs are reduced by maximising the proportion of cut-and-cover and minimising the length of the immersed-tube construction. For a Lower Thames Tunnel running between Leigh-On-Sea in Essex and Allhallows-On-Sea in Kent the pool impoundment reduces the cost of the tunnel by increasing the cut-and-cover approaches and reducing the length of immersed-tube tunnel across the remaining open tideway. The immersed tube tunnel sections are formed in a casting basin on the Isle of Grain, towed into position and sunk into a prepared trench across the open estuary. There is sufficient width in Sea Reach to maintain port operations during the immersed tube tunnel construction. The casting basin subsequently becomes a deep-water dry-dock to service shipping on the Thames and Medway Estuaries and provides the facility to cast the sections for the Sheppey Tunnel 2040.

The multimodal Lower Thames Tunnel completes a Crossrail Plus rail orbital and a highways outer orbital that together provide relief for the M25/Dartford Crossing and serve substantial growth across the Greater Thames Estuary region. On the north bank alternative Crossrail Plus orbitals can be completed via the C2C Basildon Line or the Southend Victoria Line to Crossrail at Shenfield. The rapid growth in population from Central London east along the Thames Estuary places priority on increasing capacity closer to the river hence the C2C route via Basildon is proposed as the initial orbital with the Shenfield orbital a subsequent option c2040.

2.5 Lower Thames Tunnel Connections

North Portal Connections

- new twin tracks alongside the C2C line from Leigh-on-Sea to Upminster, and dualling of the Upminster to Romford line for the extension of Crossrail services from Romford
- a subsequent option of a new connection from South Benfleet to Wickford and new twin tracks alongside the Southend Victoria services to Shenfield for the extension of Crossrail services from Shenfield
- a new passenger and freight chord at Shenfield to the Great Eastern Main Line
- road connection to the A13/A130 at Sadler's Hall Farm
- access to a new Southend Park-and-Ride bus service between Southend Eastern Esplanade and Leigh-On-Sea via the Pier, Western Esplanade, Chalkwell Esplanade and a new Leigh Esplanade that replaces the existing C2C tracks

South Portal Connections

- twin-track rail connection to the Isle of Grain Line, which is dualled from Lower Stoke to Hoo Junction for the extension of Crossrail services from Abbey Wood, with associated line improvements
- a twin-track chord from the Isle of Grain Line to the North Kent Line and Southeastern network services at Strood
- road connection to the A228/A229/A2
- rail connection to Sittingbourne and road connection to the A249 following construction of the Sheppey Tunnel 2040

2.6 Data Storage and Utilities

The Metrotidal Lower Thames Pool system generates and stores energy by moving large volumes of cool seawater between the pool and the sea. Data storage centres require reliable, sustainable energy supplies and efficient cooling systems. Modern Tier 4 centres secure alternative energy supplies for resilience and aim to achieve the lowest power usage effectiveness (PUE: total facility energy divided by the IT equipment energy). Data storage centres also require substantial cooling loads to maintain a steady-state environment for the IT equipment.

The seawater of the Thames Estuary maintains uniform temperatures throughout the year, suitable for providing a steady-state environment for the IT equipment and since the sustainable energy system moves large volumes of sea water this can be used to serve the cooling loads of the data centre, thereby achieving an exceptionally low PUE. The wide range of sustainable energy supplies used for pumping the pool provides additional resilience for the data centre supplies. The transport connections from the tunnel portals provide utility wayleaves for distributing the data across to the enabling developments across the Great Thames Estuary region.

Several existing utilities have key network connections that pass under the estuary not far from the line of the proposed tunnel. The immersed-tube tunnel cross-section includes passages for utilities with the benefit of access for maintenance and renewal. The transport corridors north and south of the tunnel provide routes for extending and connecting existing utility networks across the Greater Thames Estuary region. The utility way leaves (broadband, communications, electricity, gas, mains water and other private-sector services) contribute to tunnel revenues.

The Hoo Peninsula in Kent, one of the driest areas of the country, has a distant fresh water supply, pumped from the Medway Valley. The Lower Thames Tunnel opens a new water

supply grid connection between South Essex and North Kent for a more resilient service with less pumping.

2.7 Tunnel Transport Services

Crossrail Plus: (C2C Basildon Branch) The Romford to Upminster single-track LTS Line is dualled and connected to new twin-tracks from Upminster to Leigh-on-Sea alongside the C2C Line, with 4-tracking through the stations at Upminster, West Horndon, Laindon, Basildon, Pitsea and Leigh-on-Sea, to create the Crossrail Plus orbital between Crossrail at Romford through Metrotidal Tunnel to Crossrail at Abbey Wood.

Crossrail Plus: (Shenfield Branch) The eastern limb of Crossrail to Shenfield in Essex is extended on a 4-tracked Southend Victoria Line to Wickford and a new twin-track connection to South Benfleet and so on to Leigh-on-Sea to create an alternative Crossrail Plus orbital route on the north bank from 2040, again serving the Greater Thames Estuary and Central London. Both orbital rail routes reconnect populations north and south of the Thames, with the existing and new stations becoming the foci for commercial and residential development.

Crossrail Plus connects with HS1 at Stratford and Ebbsfleet thereby providing convenient connectivity to Northern Europe without requiring access into Central London.

Crossrail Plus: (Halling & Peters Village Branch) A branch service of Crossrail Plus from Hoo Junction to Halling on the Medway Valley Line, with two additional platforms at Halling and/or Snodland providing a terminus that serves Peters Village on the east bank of the Medway

Pitsea-Isle-of-Grain-Strood Shuttle: A rail shuttle service that links the South Essex conurbation and the Medway Towns, with terminals at Pitsea, the Isle-of-Grain and Strood. The shuttle interconnects with Crossrail Plus at South Benfleet, Leigh-on-Sea, Allhallows-on-Sea, Stoke Harbour, Cliffe and Higham, the C2C services at Pitsea and the Southeastern

Network at Strood, with the option of a branch from the Isle of Grain Line via Hoo Junction and the North Kent Line to Ebbsfleet for access to the Javelin and HS1 services into Central London and the Continent. From 2040 the Isle of Grain line can be connected through the Sheppey Tunnel to extend the shuttle rail services through Queenborough, Swale and Kemsley to Sittingbourne.

Rail freight services: A rail-freight bypass to the east of London, via the new chord at Shenfield, opens a new long distance freight route between the Haven Ports, Thames Estuary and the Channel Tunnel. The Sheppey Tunnel opens an alternative freight route between Kent, the Thames Estuary and the Haven Ports.

Road connections: A new D2 highway between the A13/A130 at Sadlers Hall Farm and the A228/A289 on the Hoo, followed by a D2 connection to the A249 through a Sheppey Tunnel after 2040. The initial connection serves the enabling development across the Thames estuary region outside the M25 orbital and provides an alternative HGV road-freight route between Dover Docks and the Midlands that avoids the congested M20/M25/Dartford Crossing/M11. The current journey from Dover Docks to the A120/M11 junction northbound lane, via the A20/M20/M25/Dartford Crossing/M11 is 158km. The distance of the alternative route, via the A2/A289/A228/A130/A12/A131/A120/M11 is 179km. After the Sheppey Tunnel opens in 2040 the alternative route from Dover Docks to the Midlands via the A2/A249/A228/A130/A12/A131/A120/M11 is 163km. Improvements to the M2/A249 and A131/A120 junctions can reduce this to 158km, matching the existing journey, again without use of the M20, M25 Dartford Crossing or M11 up to the A120 junction.

Southend Park-and-Ride: a new shuttle bus service between Southend Eastern Esplanade and Leigh-on-Sea Station Carpark via the Pier, Western Esplanade, Chalkwell Esplanade and a new Leigh Esplanade that replaces the existing C2C tracks

2.8 Enabling Development

Residential Development: Growth-zones for over 250,000 homes, including the Shelter Wolfson Prize 2014 Housing Scheme on the Hoo Peninsula and Peters Village on the Medway, served by the stations of the Crossrail Plus orbital, the Pitsea-Isle-of-Grain-Strood Shuttle and the adjoining C2C and Southeastern networks.

Commercial Development: Office developments served by the stations of the Crossrail Plus orbital, the Pitsea-Isle-of-Grain-Strood Shuttle and the adjoining C2C and Southeastern networks.

Industrial Development: New industrial development on existing sites at the London Gateway Port, Basildon, Canvey Island, Isle-of-Grain, Kingsnorth, Hoo Junction, the Medway City Estate and Strood with convenient employee access provided by the Crossrail Plus orbital, Pitsea-Isle-of-Grain-Strood shuttle and the adjoining C2C and South-eastern networks. Additional connectivity for these sites, the industrial sites at Sheerness and Queenborough on the Isle of Sheppey and for the Swale, Kemsley and Sittingbourne in Kent after 2040 with the opening of the Sheppey Tunnel and the Shenfield chord.

Benfleet Esplanade: The existing station and rail tracks through Benfleet are replaced by a new 4-platform station and underpass beneath Benfleet Esplanade accompanied by commercial and residential development that restores South Benfleet to Benfleet-on-Sea.

Leigh Esplanade: The existing station and rail tracks through Leigh-on-Sea are replaced by a new 4-platform station and underpass beneath the existing station car park. This becomes the terminus of Leigh Esplanade, which runs on the line of the existing tracks through Leigh-on-Sea to Chalkwell, accompanied by commercial and residential development that restores Leigh to being on-Sea.

Southend Park-and-Ride: Mixed use commercial development over the new station and underpass at Leigh-on-Sea to receive visitors arriving via the tunnel and its connections and distribute them to the attractions of the Southend seafront via the Southend-Park-and-Ride service. Along with the enhanced rail access Leigh-on-Sea becomes a principal portal for visitors to the Southend conurbation thereby easing traffic on the notoriously congested A13 and A127 arteries.

The combination of one or more of the proposed East London Rivers Crossings upstream of the Dartford Crossing with the Metrotidal Lower Thames Pool downstream of the Dartford Crossing means that no work is required at the Dartford Crossing. The TE2100 proposals would be cancelled. Consequently, the budgets of £4.3-4.9bn for the Highways England LTC proposals and £1.5bn for the TE2100 to 2034 can be redirected to realising the Metrotidal Lower Thames Pool proposals, resulting in much higher outputs.

2.9 Counter-Cyclical Commuting-Capacity

The proposals enable the trains that would have terminated on the eastern limbs of Crossrail at Shenfield and Abbey Wood to continue around the orbital and return on the opposite sides of the estuary. The present radial configuration of Crossrail is designed to serve the diurnal radial commuting pattern into Central London, with trains running largely empty in the opposite directions during peak hours. The Crossrail Plus orbital system around the Thames estuary provides the same Central London diurnal commuter capacity but will also make full use of the counter-cyclical commuter-capacity to serve growth across the Greater Thames Estuary region. Journeys that would have run empty can now provide the rail capacity to serve settlements around the Thames Estuary without requiring journeys into Central London. Over 250,000 new homes and corresponding new employment across the Greater Thames Estuary region can be accommodated without increasing journeys into Central London.

Furthermore, the new orbital capacity will ease congestion and improve the resilience of existing radials by providing alternative routes into Central London. Basildon and the South Essex conurbation will have the option to travel south to Ebbsfleet and on to St. Pancras, while the Medway Towns can travel via the 4-tracked C2C and Great Eastern mainlines to Liverpool Street and Fenchurch Street.

2.10 Environmental Benefits

The environmental impact of the pool is assessed in terms of the impacts on intertidal and low-lying freshwater habitats. The area of St. Mary's Marshes to be occupied by the pool is already identified for managed retreat by the current TE2100 programme. The impacts on the remaining intertidal area occupied by the pool are offset by the benefits of protecting the intertidal areas upstream from tidal squeeze and from protecting large areas of low-lying freshwater habitat from a storm surge. When the zero-carbon energy generated and stored by the system is taken into account the net environmental benefits are substantial.

2.11 Green-Growth

The integrated infrastructure provides economic growth without an associated increase in carbon audit. This green-growth is achieved through the integration of a flood defence system with a sustainable power plant that generates and stores zero-carbon energy for supply on demand. The sustainable energy offsets the demands of the new transport infrastructure and the enabling development. The sustainable pool system includes energy-efficient data storage and distribution with an exceptionally low power usage effectiveness (PUE) and new utility wayleaves that serve the enabling development. The result is full-spectrum enabling development in which housing, employment, energy, transport, data and utilities are coordinated to generate green-growth benefits across the Greater Thames Estuary region.

2.12 Agglomeration Benefits

New transport infrastructure creates an agglomeration benefit if the resulting economy exceeds the sum of the separate economies and the cost of the new transport links. Traditional agglomeration operates radially drawing satellite settlements into an ever-expanding urban nucleus. The Metrotidal Lower Thames Pool generates orbital agglomeration that spreads demand and capacity more uniformly.

The economic history of London can be seen as a series of agglomeration benefits, first from the Roman Bridge agglomerating the trade routes of the Thames Estuary with a radial road network spreading inland, accelerated by development of the regions, expanding sea trade, subsequent bridges, docks, warehouses and offices, all in turn rapidly increasing the urban economy and drawing in yet more investment. After WW2 the relocation of the port and trade from the Thames Estuary led to the contraction and separation of the economies in Essex and Kent. The Thames Estuary, for centuries the main artery of trade uniting the region into a single riparian economy from Central London to the coast, had become a barrier to growth. As a result, there are latent agglomeration benefits to be realised simply by re-uniting the economies north and south of the Thames through improved transport infrastructure. A relatively modest investment in new connectivity provides a large agglomeration benefit across the Greater Thames Estuary region. The Metrotidal Lower Thames Pool provides the new connectivity and enabling development, placing emphasis on orbital connectivity rather than extending existing radials. The congestion of Inner London arteries is avoided while full use is made of the counter-cyclical commuting capacity around the orbital, providing greater transport capacity for lower cost and higher agglomeration benefits.

The integration of the multimodal transport orbitals with flood defence, sustainable energy storage, data distribution, utilities and enabling development provides green-growth across the Great Thames Estuary region.

MW/March 2016

METROTIDAL

LOWER THAMES POOL

MARCH 2016

INTEGRATION BENEFITS

Flood Defence



Sustainable Energy Storage



Integrated Transport



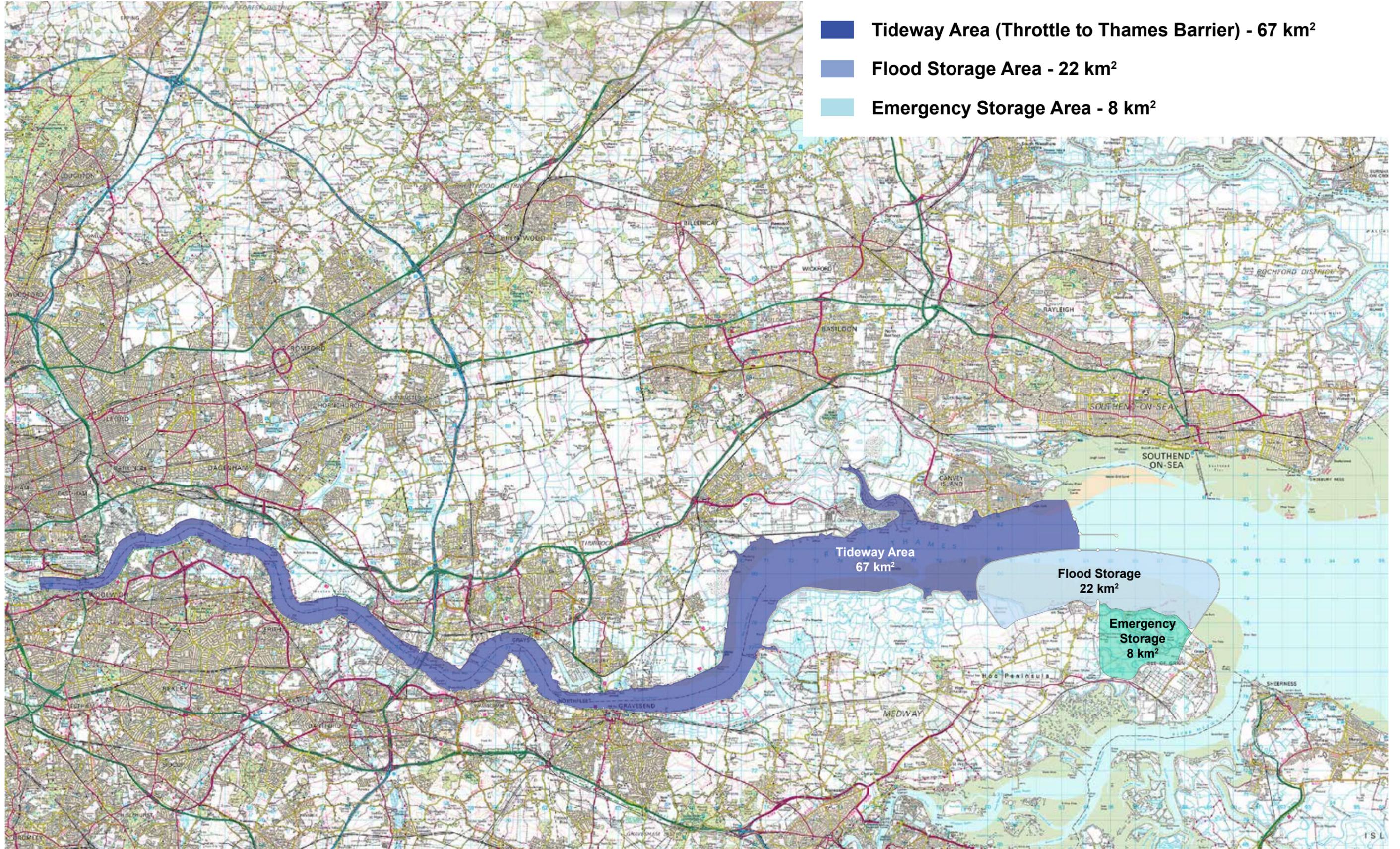
Data Storage and Utilities



Enabling Development

FLOOD DEFENCE

FLOOD STORAGE



SUSTAINABLE ENERGY STORAGE

SOLAR / WIND / TIDAL PUMPED STORAGE



INTEGRATED TRANSPORT

NEW RAIL CONNECTIONS

- CROSSRAIL PLUS
- PITSEA – ISLE-OF-GRAIN – STROOD SHUTTLE
- HS1
- - - 2040 ROUTES



INTEGRATED TRANSPORT

CROSSRAIL PLUS

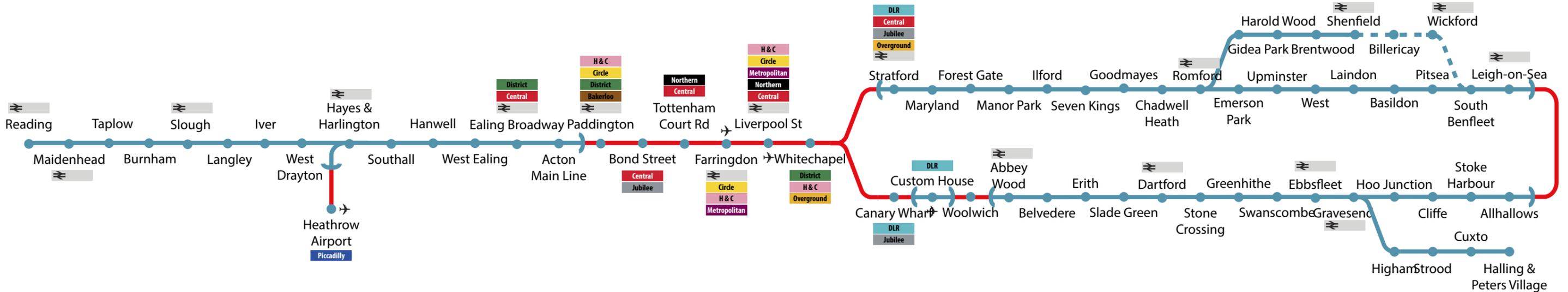


Crossrail

Route Map

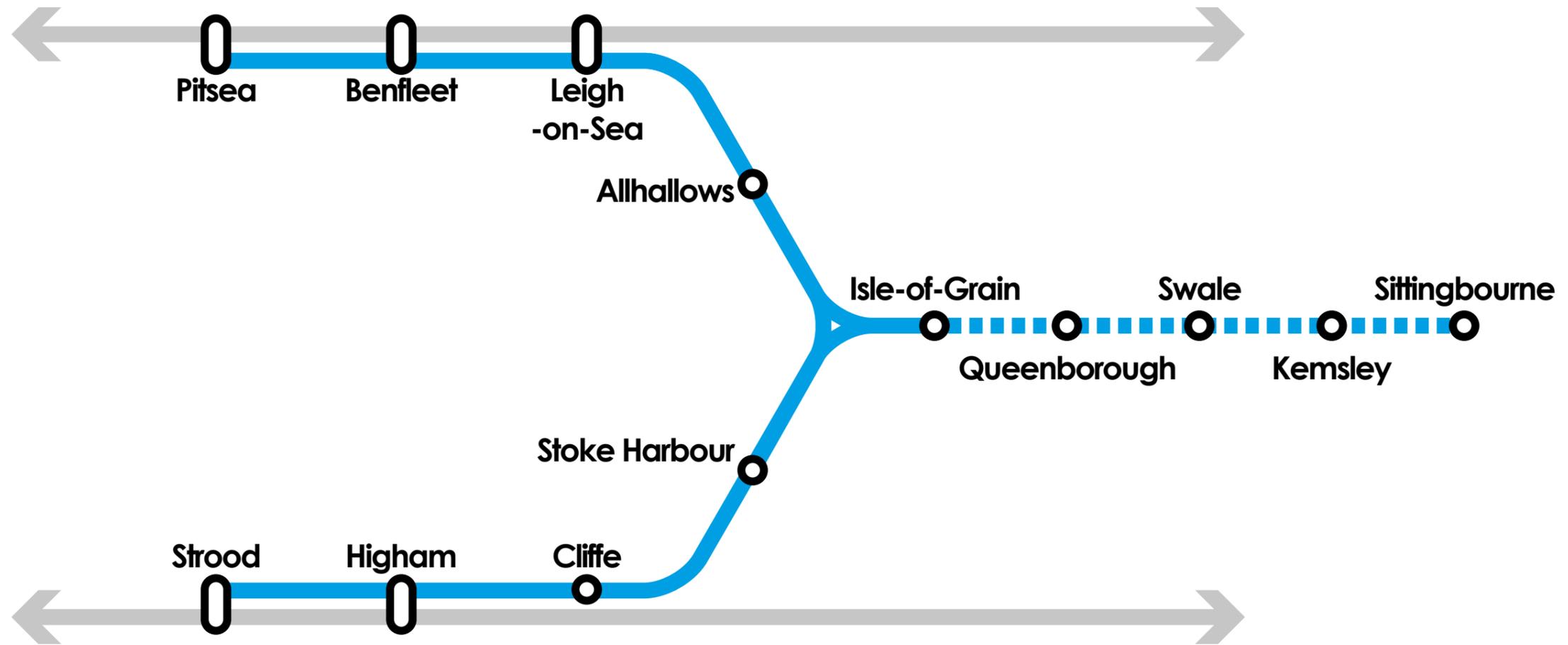


Route Connections Map



INTEGRATED TRANSPORT

PITSEA – ISLE-OF-GRAIN – STROOD SHUTTLE



INTEGRATED TRANSPORT

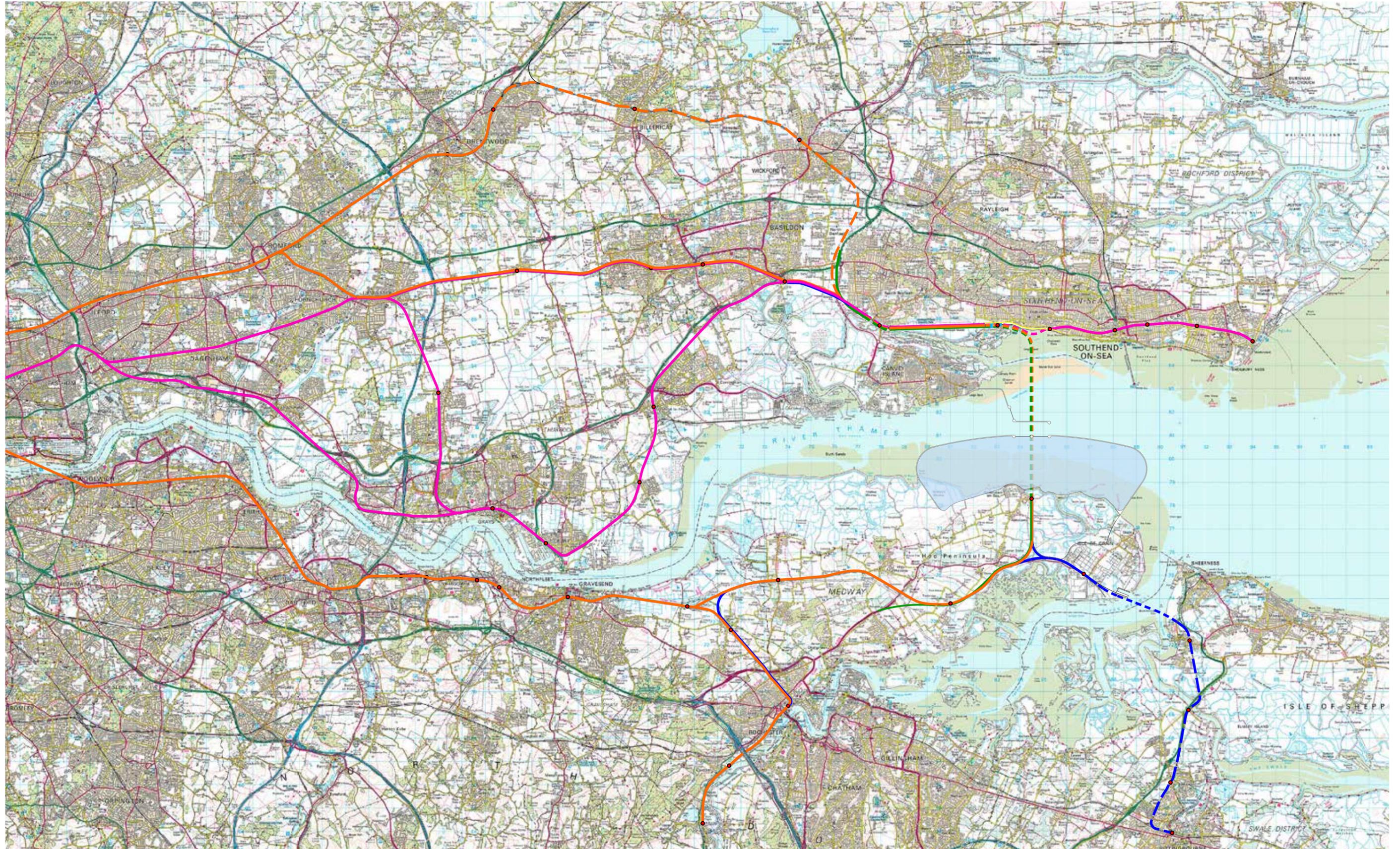
RAIL AND ROAD CONNECTIONS

RAIL CONNECTIONS

- CROSSRAIL PLUS
- PITSEA – ISLE-OF-GRAIN – STROOD SHUTTLE
- C2C
- HIGH SPEED 1

ROAD CONNECTIONS

- A13/A130 – A228/A289
- LEIGH ESPLANADE – CHALKWELL ESPLANADE



INTEGRATED TRANSPORT

RAIL AND ROAD CONNECTIONS

RAIL CONNECTIONS

- CROSSRAIL PLUS
- PITSEA – ISLE-OF-GRAIN – STROOD SHUTTLE
- C2C

ROAD CONNECTIONS

- A13/A130 – A228/A289
- LEIGH ESPLANADE – CHALKWELL ESPLANADE



REGIONAL ROAD CONNECTIONS

-  MOTORWAYS
-  MAIN ROADS
-  METROTIDAL LINKS



TUNNEL CONSTRUCTION



TUNNEL CONSTRUCTION

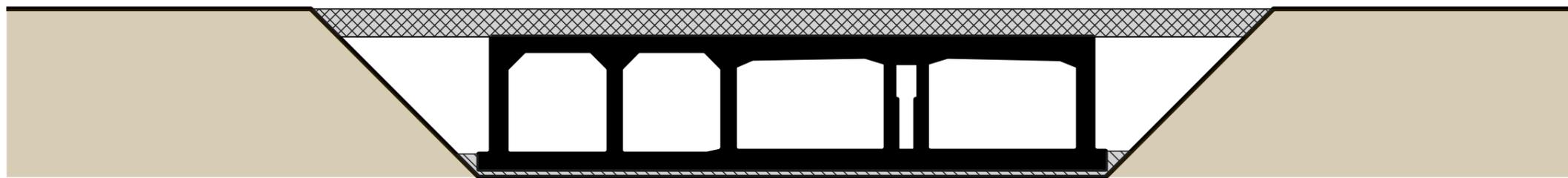
SHORTER TUNNEL OPTION



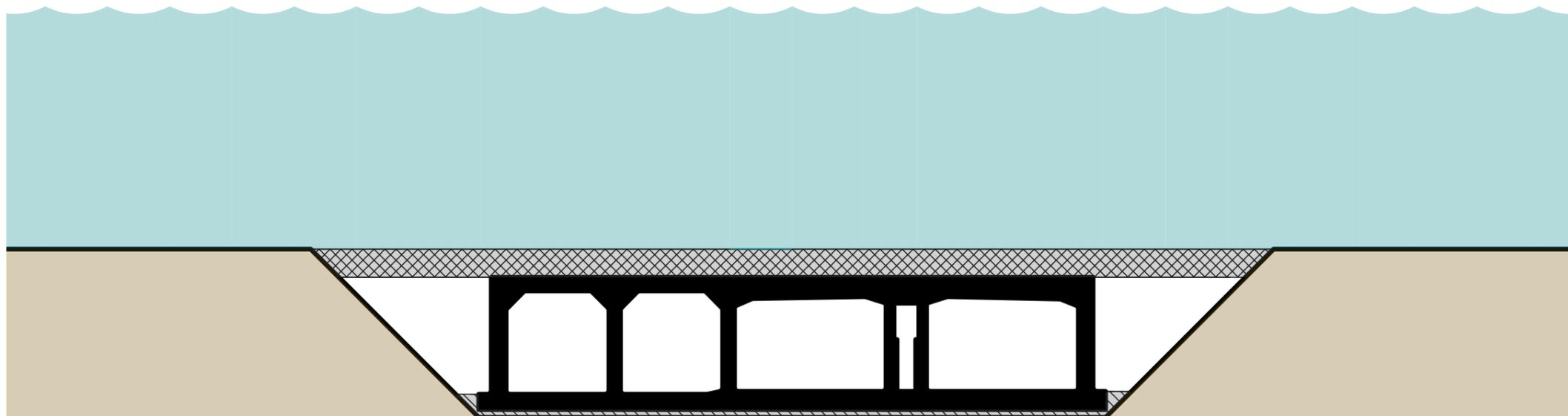
D2T2 IMMERSED TUBE TUNNEL



OPEN-CUT TUNNEL APPROACHES

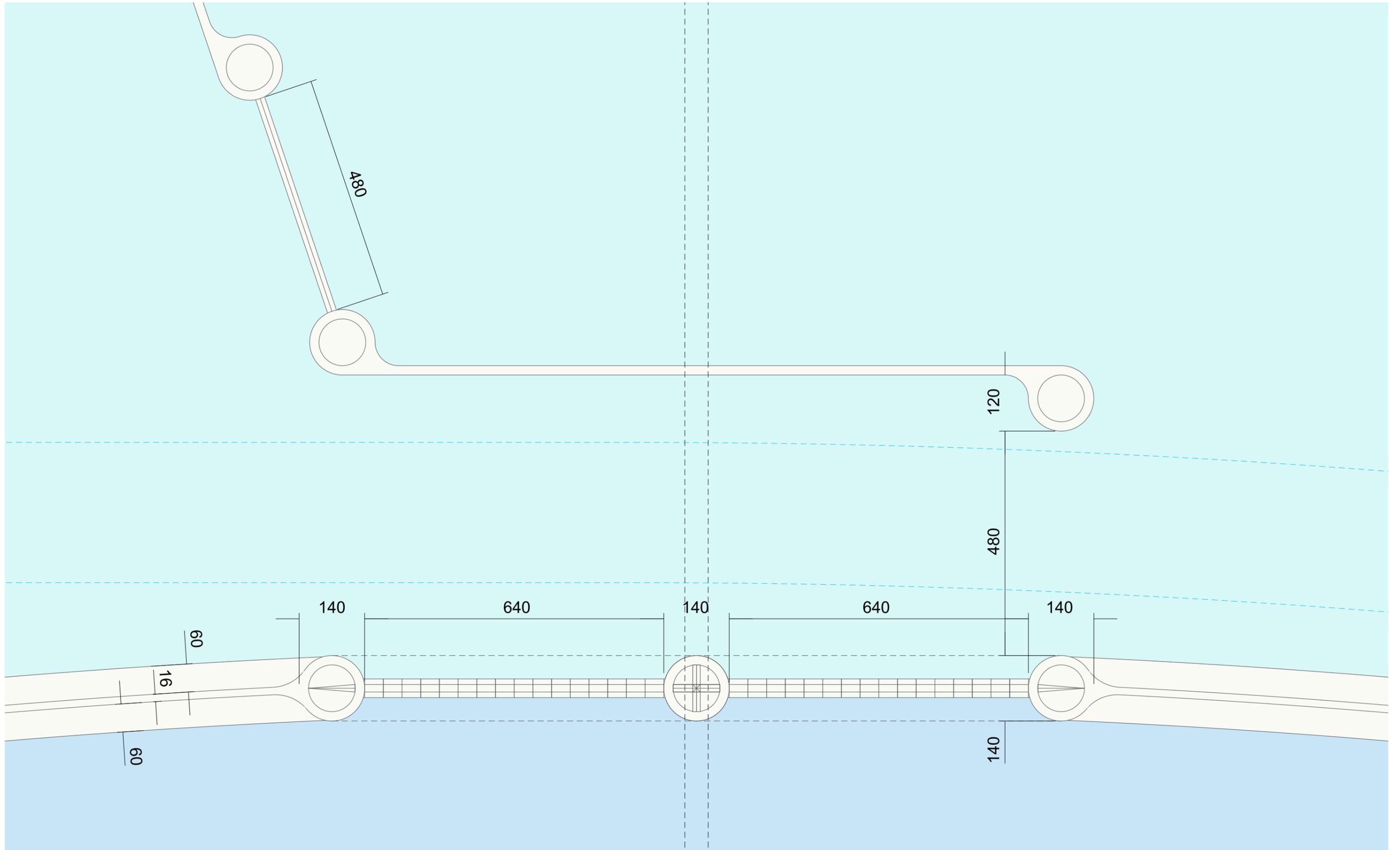


CUT-AND-COVER ACROSS INTERTIDAL AREAS



CUT-AND-COVER UNDER RIVER

THROTTLE DETAIL



DATA STORAGE AND UTILITIES

INFRASTRUCTURE UTILITY WAYLEAVES

 DATA STORAGE

 DISTRIBUTION



ENABLING DEVELOPMENT

STATION-FOCUS GROWTH ZONES



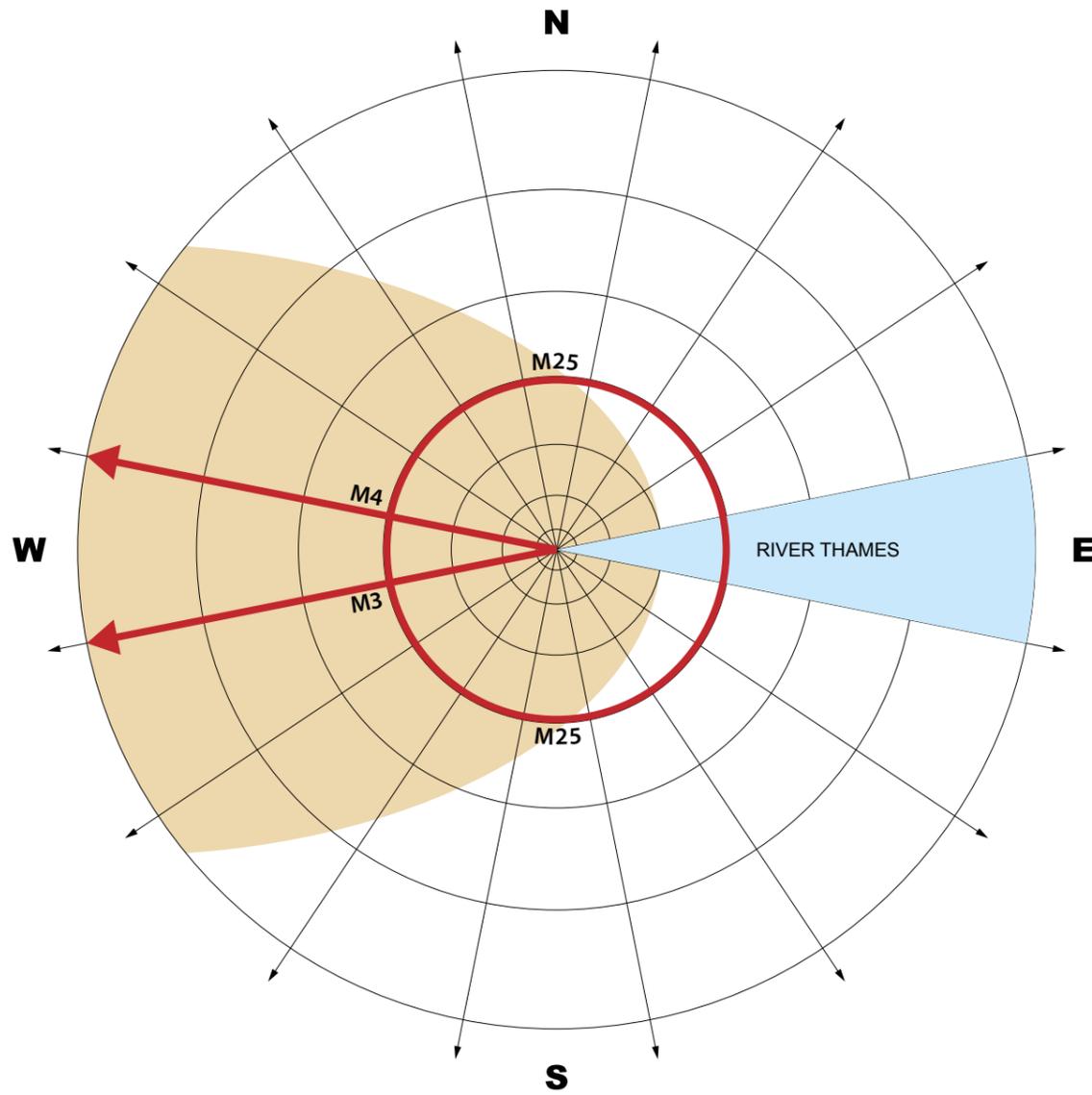
STOKE HARBOUR MASTERPLAN – HOO PENINSULA

SHELTER WOLFSON ECONOMICS PRIZE 2014 HOUSING SCHEME

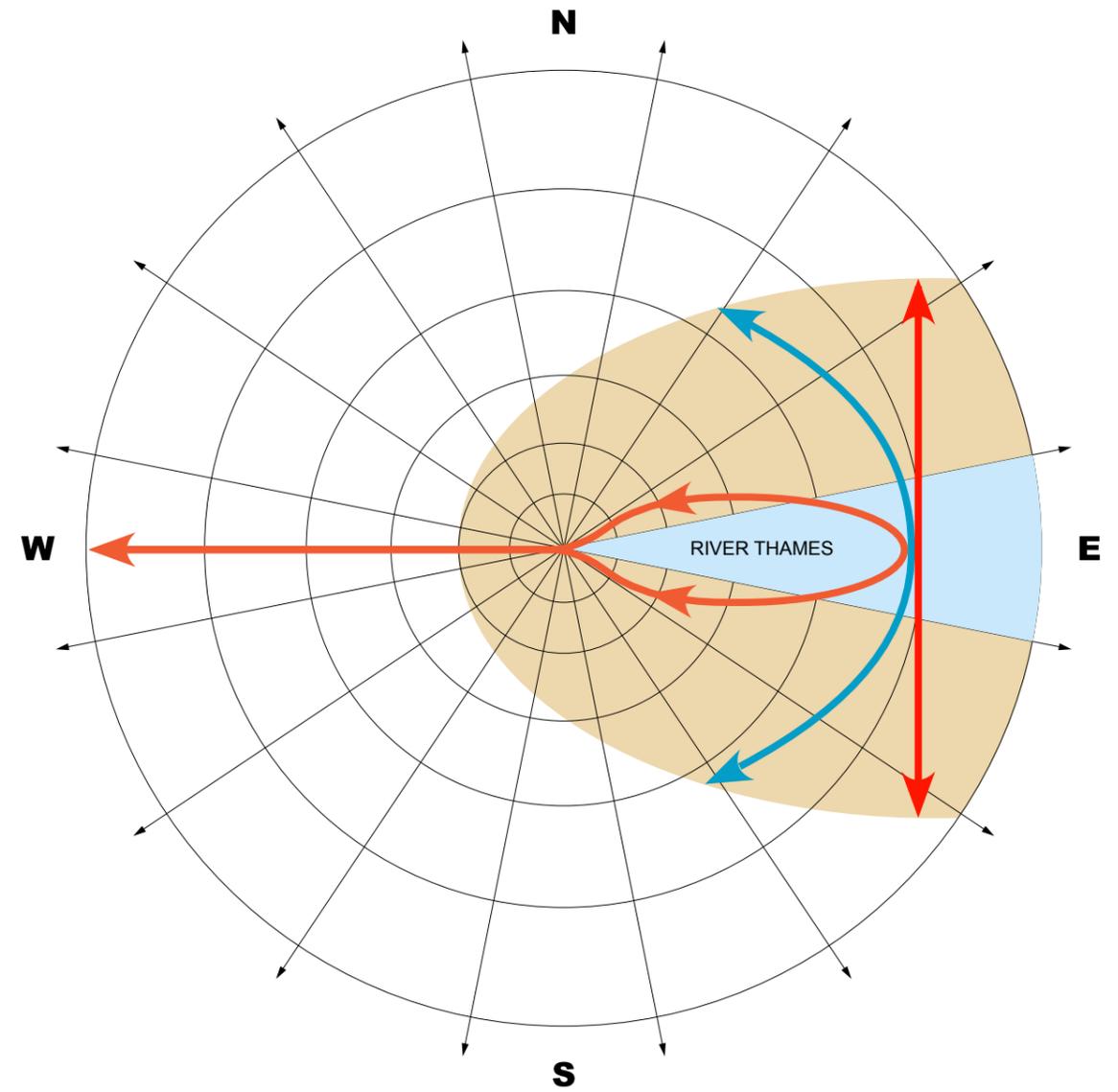


AGGLOMERATION BENEFITS

TRANSPORT NETWORKS AND GROWTH AREAS FOR LONDON



HISTORIC SYSTEM
GROWTH IN THE WEST



PROPOSED ADDITION
GROWTH IN THE EAST

INTEGRATED TRANSPORT

METROTIDAL CANVEY-HOO ROUTE OPTION

RAIL CONNECTIONS

- CROSSRAIL PLUS
- PITSEA - STROOD SHUTTLE
- C2C
- SHEPPEY TUNNEL

ROAD CONNECTIONS

- A13/A130 - A228/A289





Lord Andrew Adonis
Chair - National Infrastructure Commission
1 Horse Guards Road
London
SW1A 2HQ

Our Ref:
Your Ref:
Telephone: [contact redacted]
E-mail:
Date: 08 January 2016

Dear Lord Adonis,

Midlands Connect response to “Critical Infrastructure Challenges Submission to Infrastructure Commission”

Thank you for the opportunity to respond to the above document.

As part of last summer’s budget, Government confirmed its commitment to backing the Midlands to ensure it is Britain’s Engine for Growth and allocated **£5 million of additional funding for Midlands Connect** to help develop its vision and strategy for transforming transport connectivity across the Midlands (background information on Midlands Connect is enclosed for your information).

The strategy, currently being developed by the Midlands Connect Partnership together with the Department for Transport, will set out credible long-term strategic transport investment priorities to help unlock growth and jobs.

The Midlands Connect partnership believes the establishment of the national infrastructure commission presents an excellent opportunity to achieve a more consensual and long-term strategy for strategic transport infrastructure in the UK.

However the Commission’s current focus on northern connectivity, London’s transport infrastructure and energy is of concern to the Midlands Partnership as it gives no consideration to the Midlands and its strategic infrastructure transport requirements.

As you know the Midlands Connect Partnership met in December 2015 in Derby when it established a new strengthened governance arrangements with Government including the appointment of Sir John Peace as the Independent Chairman of the Strategic Board. The newly formed Midlands Connect Strategic Board will be meeting for the first time on February 4th.

I take this opportunity to invite you to join us on the day so we can learn first hand about the work of the Commission and explore opportunities for greater engagement with the Midlands as the work of the Commission develops further.

Yours Sincerely,

A handwritten signature in black ink, appearing to read 'Maria Machancoses', written over a horizontal line.

Maria Machancoses
Midlands Connect Programme Director
Midlands Connect Project Team



Midlands Connect Response to Critical Challenges - Northern Connectivity

Question 1: To what extent are weaknesses in transport connectivity holding back northern city regions (specifically in terms of jobs, enterprise creation and growth, and housing)?

Through our work on Midlands Connect our analysis shows that there will be large economic benefits from improving road and rail connectivity in the intensive growth corridors, by reducing the costs of travel, increasing output by facilitating business clustering, and unlocking job creation in our growth areas. This will require concerted action to tackle the connectivity challenges that we have identified.

There are significant connectivity challenges that will constrain the ability of the Midlands to realise its ambitions for growth. Whilst the Midlands lies at the heart of the UK's road and rail networks, the mix of long-distance, regional and local travel needs is placing heavy demands upon them.

The Midlands motorway network is subject to heavy congestion, with traffic delays and poor journey reliability, meaning that businesses, commuters and leisure travellers have to schedule additional time into the journey to give confidence that they can arrive at destinations on time.

This wasted time significantly increases the direct costs of travel, impacts on business productivity and is constraining the potential for business growth. Increased demand for travel in the Midlands will place the system under further strain, increasing costs of travel and constraining job creation. The analysis completed to date as part of Midlands Connect highlights that we will need to tackle congestion hotspots as well as looking at the reliability, resilience and quality of journeys provided by the strategic road networks.

There are fast, frequent rail links connecting large parts of the Midlands to the north and south, via the West Coast, Midland and East Coast Main Lines. However, there are major challenges travelling by rail between the Midlands cities, with long journey times and low service frequencies impacting on connectivity. This is a particular issue for the more rural areas such as The Marches, Worcestershire and Lincolnshire as this makes travel by rail inconvenient, leading to an increased reliance on car travel and reducing the scope for interaction between our cities. In particular, the slow speeds between the key regional cities of Nottingham and Birmingham highlights the need for improvements to be made to the classic rail networks in advance of HS2 Phase 2 which is scheduled for completion after 2030.

As connectivity between cities becomes more important in future, this will significantly constrain the capacity for growth in the cities across the Midlands. There is also an increasing problem of capacity and crowding on services entering and crossing Birmingham. This will cause problems both in accommodating growth in Birmingham and in improving rail connections across the whole Midlands.

Whilst the commission is focused upon connectivity, the importance of integrating growth plans and transport plans should be also recognised. Improving connectivity for the Midlands will create investment opportunities, but site development viability remains a long term constraint to the central urban areas absorbing the projected growth and realising the estimated anticipated economic benefit. Integrating strategic land use and strategic transport planning is crucially important.



Question 2: What cost-effective infrastructure investments in city-to-city connectivity could address these weaknesses? We are interested in all modes of transport.

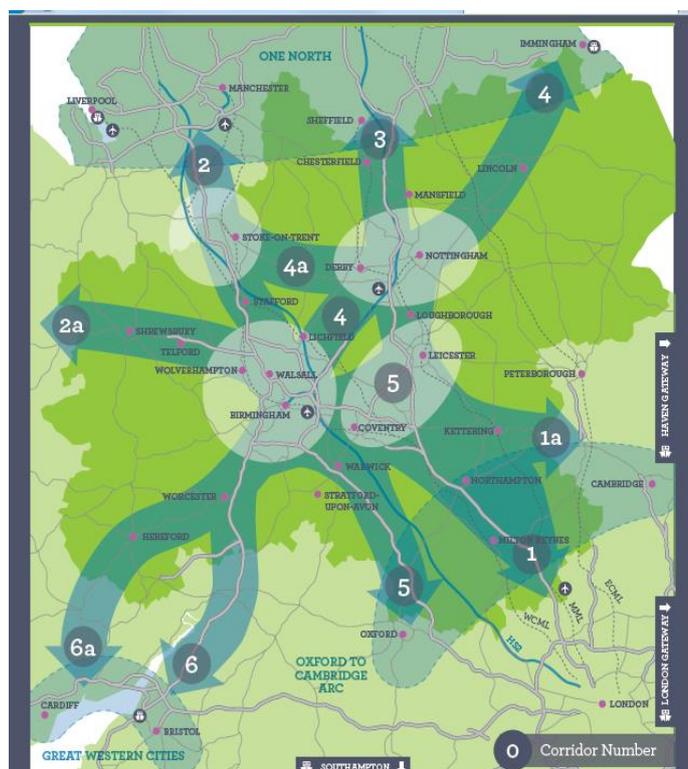
At this stage of Midlands Connect we have not defined solutions. With the support from DfT we are now developing the Midlands Strategic Transport Strategy that will set out our priorities with a clear evidence base.

Highways England and Network Rail are in the process of undertaking Route Studies across the Midlands to inform investment strategies post 2020. There are also medium to long-term opportunities to deliver HS2 Growth Strategies to fully capitalise on the opportunities for the whole Midlands. Midlands Connect will provide the mechanism to inform and draw together these elements into a single strategy that delivers much more than the sum of the parts

High Speed 2 will transform north-south travel, bringing Birmingham within 40 minutes and the East Midlands within one hour from London. It will also significantly improve connections between Nottingham and Birmingham. However, it will be critical to develop full connectivity packages to fully capitalise on the opportunities provided by new stations serving the West Midlands, East Midlands and North Staffordshire. It will also be important to reconfigure classic rail services to better meet the connectivity needs of the whole Midlands, including Northampton, Coventry and Leicester. However, prior to the arrival of HS2 and in particular the Phase 2 links, it is vital that the classic rail network continues to be enhanced and services improved to enable the continued growth of the Midlands economy.

Question 3: Which city-to-city corridor(s) should be the priority for early phases of investment?

Midlands Connect Partnership has identified six “intensive growth corridors” and four major hubs of economic activity across the wider Midlands - an area with a population of 11 million. These are shown in the map below.



The table below provides a summary of the impacts of improvements to connectivity (generalised journey times) to the Midlands by both road and rail, for both 2026 and 2036 have been assessed.

	2026 with 10%GJT reduction	2026 with 20% GJT reduction	2036 with 10% GJT reduction	2036 with 20% GJT reduction
Business JT Savings	£172 million	£341 million	£230 million	£460 million
B2B Agglomeration benefits	£514 million	£1,102 million	£550 million	£1,180 million
Labour Market impacts	£12 million	£29 million	£15 million	£33 million
Net additional jobs	138,000	296,000	143,000	306,000

Overall, there could be significant potential from improving strategic road and rail linkages – both north-south and east-west.

Question 4: What are the key international connectivity needs likely to be in the next 20-30 years in the north of England (with a focus on ports and airports)? What is the most effective way to meet these needs, and what constraints on delivery are anticipated?

The Midlands accounts for 16% of all UK exports selling to over 178 countries worldwide.



The Midlands Engine region is well linked internationally. Inward investment projects grew by 130% between 2011 and 2015 based on a compelling Midlands offer of commercial opportunity, affordability, connectivity and quality of life. In the same period, the Midlands Engine region attracted 880 Foreign Direct Investment projects creating over 48,000 new jobs and safeguarding a further 23,000.

It goes without saying that connectivity to ports and airports will be vital for continued growth.

The international gateways at Birmingham Airport and East Midlands Airport are critical to the whole Midlands economy. Currently Birmingham Airport acts as a business gateway to major global markets, including China, and East Midlands Airport is the UK's most important air freight hub outside London. Both Birmingham and East Midlands Airports have ambitious growth plans for the future which will support the growth of the wider Midlands economy. Effective surface access links to these hubs are therefore critical to ensure that they can operate effectively in the future. Both airports are challenged in this respect, with East Midlands Airport only accessible via road and Birmingham Airport located adjacent to congested strategic road links and also not having direct rail links to the East Midlands.

The Midlands is also served directly by several ports including Grimsby and Immingham and Boston. Addressing the reliability and speed of connectivity will be essential to improve the efficiency and productivity of our businesses. With 16% of all UK exports there are significant gains to be made.

With the strong export market of the Midlands wider connectivity to national ports is vital. Our work to date has identified that there is a need to address reliability of the links to ports including Enhance road freight links (with a focus on speeds and reliability) between the Midlands logistics and manufacturing hubs and ports, including Humber, Haven Gateway, Southampton, Bristol and Liverpool. Key sections of the network that need addressing include the M6, M5, A14, Birmingham Box and onwards connections to ports such as Southampton.

Question 5: What form of governance would most effectively deliver transformative infrastructure in the north, how should this be funded and by whom, including appropriate local contributions?

The current proposal regarding Sub-National Transport Bodies and Combined Authorities at regional levels are appropriate and effective forms of governance in the Midlands to deliver transformative infrastructure.

Mole Solutions Submission of Evidence to the National Infrastructure Commission.

Executive Summary

This submission of evidence to the NIC is that the Mole Solutions Limited freight pipeline concept can bring innovation and benefits to future UK and global transport systems in general and that of London in particular.

DEFRA, Innovate UK, Future Railway and the Nuclear Decommissioning Agency have already invested in Mole Solutions' R and D projects that have proved both the concept and demonstrated the technology. A Feasibility Study of the Mole Urban Concept was completed for Northampton in 2015 and showed that it is technically, economically, socially and environmentally viable at comparatively low volumes. Examples are given as to how the concept could be used in a number of current scenarios within future London transport schemes.

The next step is to embrace the concept as a significant input to future transport planning and integrate it as a complimentary feature with existing transportation infrastructure.

Introduction.

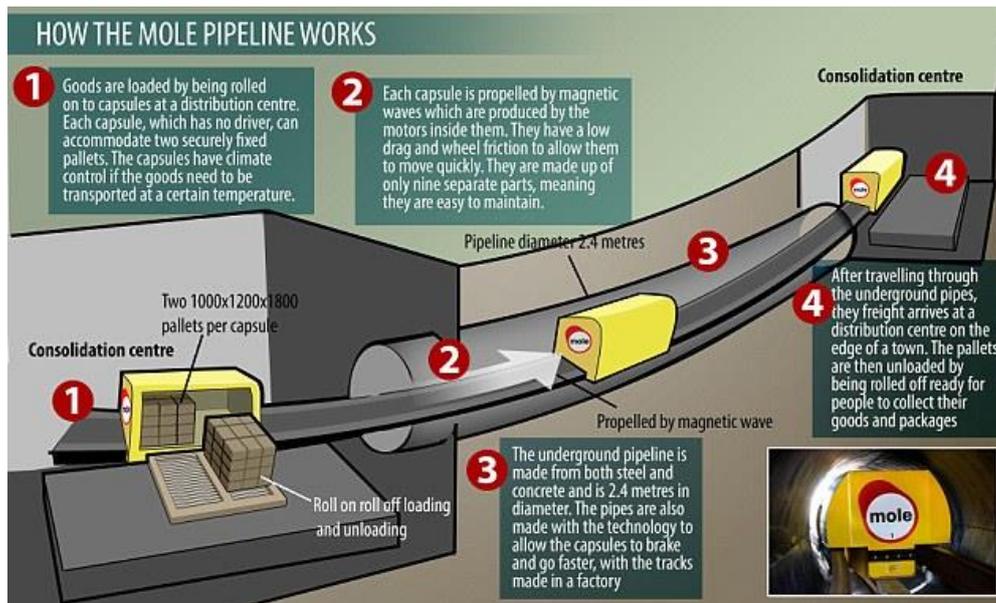
Mole Solutions Limited (MSL) evidence to the NIC is based on the potential impact that freight pipeline technology can have on the freight strategy needs of the UK and London specifically.

Underground passenger transport has been commonplace in London, and many other global cities, since the 19th century but underground freight transport of solid goods within cities does not exist anywhere in the world. Freight pipelines are currently limited to the transport of liquids and gases and also play an important role in the delivery of clean water to, and dirty water from, most properties in the civilised world.

MSL was established in 2002 with the business objective of developing and commercialising the concept of freight pipelines designed to carry unitised and non-unitised goods: tote bins, pallets, roll cages, shipping containers; bulk products: minerals, building spoil, aggregates, biomass, etc. See www.molesolutions.co.uk

MSL's research has shown that the major applications of freight pipelines in London can be:

1. In major regeneration projects where a freight pipeline could be used for the removal of spoil and the delivery of a large percentage of building products to the regeneration site
2. On completion of the building project the freight pipeline can be readily converted to provide a goods delivery system to the site's new function
3. In the use of consolidation centres where freight is delivered to an out of area consolidation point avoiding HGV's in the congested city centre. Freight is then transported in a freight pipeline to its point of use or to a substation for last mile delivery by appropriate eco-friendly transport. See illustration



Principles of the Mole Freight Pipeline concept are:

- SIMPLE and MATURE technology to provide high reliability, availability and maintainability
- ELECTRICALLY POWERED to be sustainable and have low environmental impact
- ENCLOSED to be safe and secure
- HIGHLY AUTOMATED to allow 24x7 unmanned operation
- MODULAR CONSTRUCTION to minimise time and cost of installation
- LAID BESIDE/UNDER EXISTING TRANSPORT INFRASTRUCTURE to simplify installation and integrate with existing supply chains

Benefits of the Mole system are:

- VERY LOW DIRECT OPERATING COSTS: automated, energy efficient, simple maintenance and repair offers direct operating costs of approximately 15% of road costs
- COST EFFECTIVE INCREASE IN INFRASTRUCTURE CAPACITY: modular construction using the total 3D footprint of existing and disused transport infrastructure shortens the construction time and provides attractive investment returns at low capacity utilisation
- INDIRECT COSTS: resilient transport infrastructure enables reliable Just-In-Time services allowing the full JIT benefits to be realised
- SOCIAL: freight only, separate system offers intrinsically the lowest accident rates of any mode; transferring freight from the roads releases capacity and contributes to a reduction in congestion
- ENVIRONMENTAL: lowest environmental impact of all the transport modes - power is as green as the electricity supply; low carbon, air pollutants and noise, significant reduction in road damage.

Freight Pipeline projects since 2010

The Freight Pipeline concept has been recognised as an emerging and viable transportation system by DEFRA/DfT, the Technology Strategy Board, Innovate UK and Future Railway all of whom have grant funded research and development projects by MSL over the last five years. Additional support in these projects has come from a number of partners including DHL, Laing O'Rourke, Morgan-Sindall, PA Consulting Group, Arup, Force Engineering, WGH Engineering, Lafarge-Tarmac and Urban and Civic. MSL have shown in the following projects that the concept is applicable to a wide range of freight transport:

1. 2015 completed on time and budget four projects:
 - a. An Innovate UK 'Proof of Concept' project to establish the viability of the Mole Urban Freight System in Northampton. The conclusion is that the concept is viable and it is planned to begin in 2016 the development of a comprehensive Business Plan for Northampton. The project has also developed the methodology that can be used to evaluate the concept in any conurbation anywhere in the world.
 - b. A Pre-Feasibility Project of the Mole Urban Freight System for Transport for Greater Manchester. The proposed system could be used: to extract spoil from the major regeneration of the Manchester Piccadilly Station area; the delivery of most of the building products to the site; a legacy goods delivery system from Port Salford into Manchester. An outline Feasibility Study proposal was produced and is being considered by TfGM as part of their total transport strategic plan.
 - c. In conjunction with ARUP, an evaluation for Radioactive Waste Management of the use of the Mole system in the development of Deep Storage Facilities. The conclusion reached was that the concept offered significant benefits for much of the freight transportation required in the development and operation of the proposed facility. Outline designs for the components of the system were produced which would provide the basis for a detailed Feasibility Study when required.
 - d. MSL were successful in a Future Railway competition to study the use of Linear Induction Motors (LIMS) to provide independent braking to trains when the conventional wheel on rail braking fails due to circumstances such as leaves on the track. The study showed, using computer simulation and physical trials on a modification to our development track, that the Mole concept met the competition brief. The next stage is to submit a proposal for second stage funding to scale up the components and evaluate a full size pilot system. If MSL are successful with their proposal, work will begin in the middle of 2016.
2. In addition, in July 2015 MSL were selected by the University of Texas (UoT) to be a member of the Stakeholder Group for the Feasibility Project into the potential use of freight pipelines in Texas. This 3M\$ study is financed by the State of Texas and is focussed on evaluating the use of LIM powered freight pipelines to transport thousands of shipping containers over distances in excess of 250 miles. We have reached an agreement with UoT that MSL will provide technical input on the design of the hardware and software in the development of the concept.
3. 2013/14 designed, commissioned and demonstrated to more than 70 organisations a bulk system capable of carrying 10m tonnes per annum in a pipeline of 1.3m internal diameter. The project was part funded by a TSB 'Development of Prototype' grant.

4. 2012 completed a 'Proof of Concept' project, partly funded by the TSB 'Smart Grant Scheme', the objective of which was to: produce outline designs for the components of a bulk freight pipeline system; compare the financial viability of a Mole system with long haul conveyors; produce an animated video explaining the concept. The project outputs are: the outline designs; a financial analysis that showed for volumes greater than 750ktpa and distances greater than 750m, a Mole system offered a better investment than conveyors and would be much safer and cleaner; the video can be viewed at our website: www.molesolutions.co.uk
5. 2010 Completed a DEFRA funded/DfT managed Feasibility Study: '*Assess the feasibility of using freight pipelines to transport aggregates in England*'. The conclusions reached are that: the individual technologies are well proven - the innovation is in the manner in which they are combined; at relatively low levels of capacity utilisation (~ 10%) the return on investment was calculated as 10% and this increased with utilisation; major social and environmental benefits would be generated; simple routes could be developed in less than three years

Technology Readiness Level (TRL).

The recent projects have shown the individual components of the Mole Concept are all well proven technologies; the innovation that Mole Solutions has developed is combining these individual technologies into a world leading Freight Pipeline system with extensive global applications.

Global potential.

MSL have attended and presented papers at the last three International Society Underground Freight Transport Conferences: University of the Ruhr, Shanghai and University of Texas. Attendance at these events came from the UK, USA, China, Japan, Germany, The Netherlands, Italy, Canada, Belgium and Turkey.

In April 2015, MSL were interviewed by the FT and the subsequent article produced a tsunami of publicity both in the UK and from around the world. The level of interest in this innovative approach to the global issue of road congestion is considerable. Further press releases are planned for the first quarter of 2016.

Specific evidence for London's transport infrastructure.

Mole Solutions evidence is focussed on the potential of underground freight pipelines within London and its commuter hinterland.

Q1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

The major challenges facing London and its commuter hinterland are summarised in the Roads Task Force report published in July 2013.

The key issues are:

- Population growth. The population of London is expected to increase by 2.06 million by 2036
- Limited space: the challenges of meeting the conflicting demands of the capital call for innovative transport solutions that make a significant contribution to maintain and increase the quality of life in the capital.
- Road congestion: costs in excess of £4bn per annum and has been increasing by approximately 1% per annum whilst traffic levels have fallen by a similar rate. Freight accounts for 30% of London's peak traffic and any scheme which can reduce this will lessen the predicted increase in congestion in Central London.
- Safety: the removal of a significant number of freight vehicles from the streets of London will help to remove the perceived danger of these vehicles by inexperienced cyclists thereby aiding the ambition to increase the planned growth in cycling within London
- Pollution: Unless London's air quality improves, the EU is expected to fine the Capital £300 million. MOLE has the potential to be part of a solution which will improve London's air quality, particularly the reduction of NOX and CO₂.
- Cost: the DfT's value for infrastructure damage from HGV's in conurbations are 28p/truck mile for 'A' roads and 171p/truck mile for other roads. Trucks are therefore a major contributor to road maintenance and a reduction of road freight miles should be reflected in lower road maintenance costs.

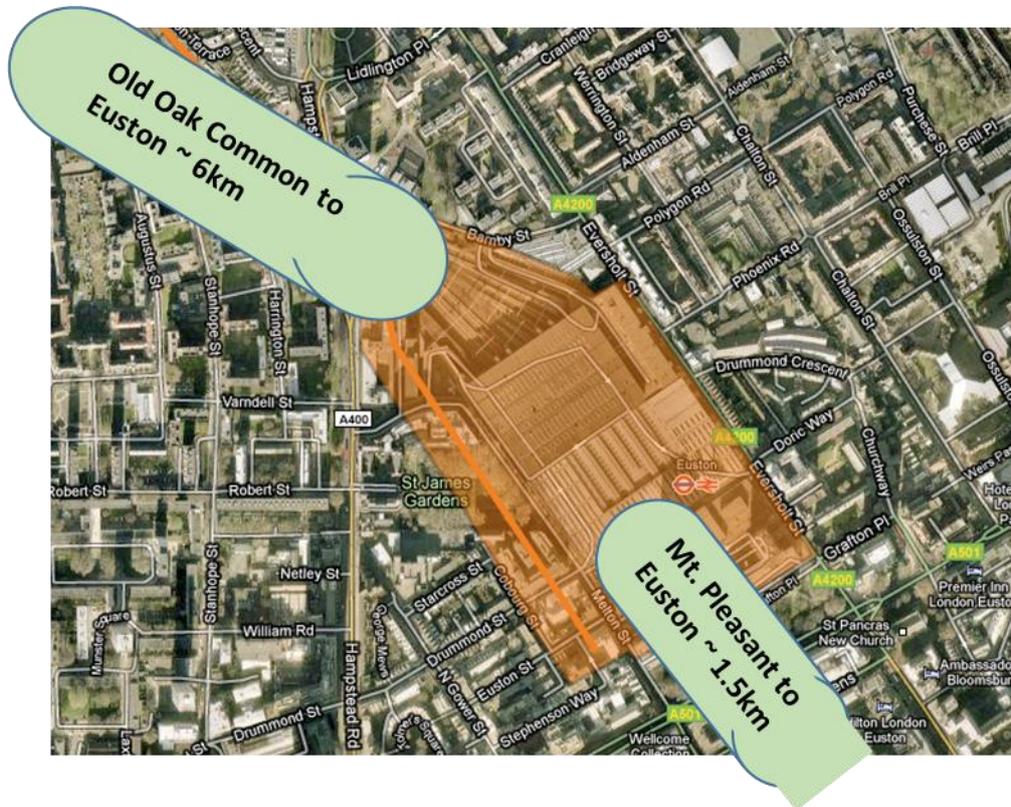
Q2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

Our submission is based on the development of underground freight pipelines to take a significant volume of road freight off of London's streets and transfer the goods to capsules travelling on rails in pipelines of approximately 2.4m internal diameter.

"I've seen the Mole Solutions demonstrator and therefore seen how much of freight can be transported in the 21st century; anyone involved in designing transport infrastructure should understand what role the Mole concept can, and can not, perform within their plans". Darryl Stephenson, Head of Value Engineering, HS2, July 2014.

Examples of how a freight pipeline system could fit with the planned and existing transport infrastructure projects for London are given below. The examples are suggestions only, there are many other applications where the freight pipeline concept would be part of, if not all of, the solution.

Example A – HS2 and Euston Station.



Possible pipeline routes to/from Euston

It is planned to make the new Euston Station a major retail complex and for the goods for the total station to be delivered by road via an access from the Hampstead Road to an undercroft of four acres, the construction cost of which is estimated as £100m. Delivering the goods and removing the dry waste by means of a Mole system would reduce the need for such a large undercroft and reduce congestion on one of the busiest routes into the centre of London.

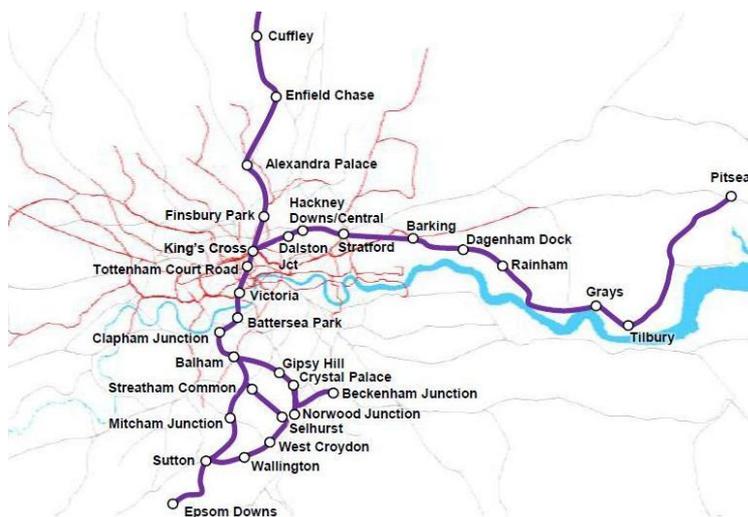
Two routes are possible:

1. Towards the Old Oak Common / Park Royal area where goods destined for Euston would be delivered to a consolidation centre. Here the goods would be transferred to a pipeline constructed largely under the canal network.
2. Developing a short tunnel from Euston to the Mail Rail system near Mount Pleasant; a modernised and extended Mail Rail system could then be used to connect to the Park Royal area, again using a pipeline under the canal network.

Example B – Crossrail 2 – Option 12.

The Mole Solutions approach would involve:

1. Designing CrossRail 2 to incorporate 2.4m internal diameter freight pipelines beside the 7.0m internal diameter tunnels of Cross Rail 2
2. These pipelines could be used as a safer, more reliable spoil removal system in the construction of the tunnels
3. Extending CR2 to Pitsea and including Mole freight pipelines in the construction would provide a pipeline link to London Gateway Container Port and Logistics Park and offer a freight route into London avoiding one of the most congested sections of the M25, The Dartford Crossing. Again, the system can be designed to deliver goods into London and for the removal of much of the dry waste products.



In addition to the benefits mentioned in Q1 the use of a Mole system that provides a reliable, regular delivery service throughout the working day enables stock to be held remotely in areas where rents are typically 10% of central London, Approximately 25% of the area of a typical retail store is non-selling space including back room storage space. The ability to convert this storage space into retail would be of significant benefit to retailers.

Sectors served by the freight pipeline system are largely those served by road: retail, commercial, public sector, etc.

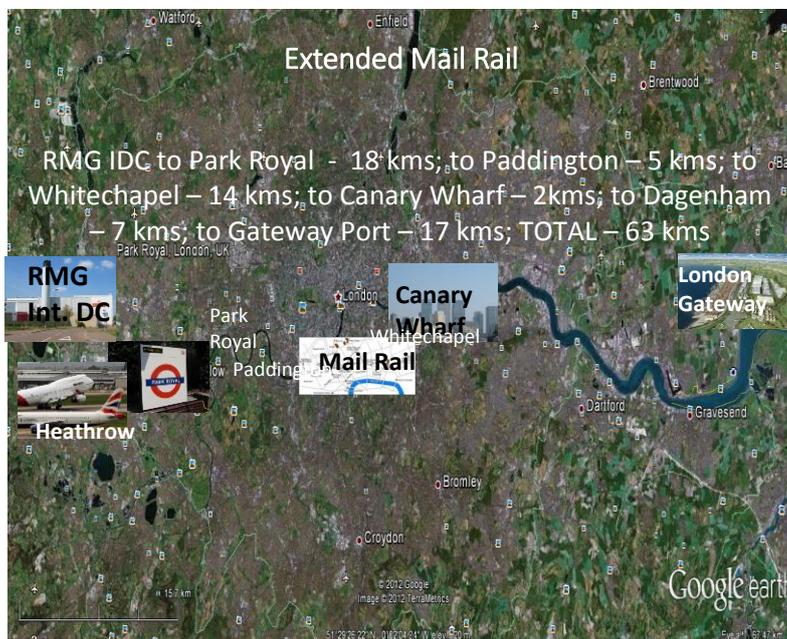
As in Example A, goods destined for the centre of London would be delivered to strategically located consolidation centres (e.g. the logistics park co-located at London Gateway Container Port) from where the loaded capsules would travel to a number of locations within London. These locations would be located in, or very close to, centres of high demand which would also be the operational base for low impact 'Last mile' delivery vehicles.

Example C – Modernised and Extended Mail Rail.

London is fortunate to have had the only extensive goods freight pipeline in the world, Royal Mail's Mail Freight system that operated under the streets of London from Whitechapel, via the City, Mount Pleasant and under Oxford Street to Paddington. The system operated reliably and cost effectively from 1927 to 2003 when the system was mothballed. Although a section around Mount Pleasant is being converted into a postal museum, the remainder of the nine mile long system is considered to be in a good condition and could be made operational at a comparatively low cost and in a matter of months.

The Mole Solutions approach would involve:

1. Modernising the existing mothballed system
2. Tunnelling round the Mount Pleasant area to re-establish the Paddington to Whitechapel route
3. Tunnelling from Mount Pleasant approximately one kilometre north to provide a link to Euston and St. Pancras Kings Cross
4. Extending the system to the west to beyond the M25 to serve Heathrow and beyond. The route for this could either be from Paddington, the existing western end of Mail Rail, using the route of the Grand Union Canal system to Slough or via a Euston – Park Royal pipeline and then the Grand Union Canal. In the east, the system could be extended from the current terminus at Whitechapel out to London Gateway using either the route of CR2 Option 12, or a new route laid predominantly under the Thames.



When fully operational, Mail rail had nine stations with street level access, at most of these the street access has been closed although the underground station still exists. New access methods would need to be designed and constructed.

A principle of the Mole concept mentioned in the introduction is that of modular construction. This entails constructing the key components of the system (track, propulsion and control) in 12m length modules off site in the form of a sleeve that is delivered to the construction site where it is slid into the tunnel sequentially.

It is assumed that the existing Mail Rail tunnels are still covered by a Transport Works Act (TWA) but clearly any extensions and new street level access points will need a TWA and Planning Approvals

Example D – London Building Projects.



Route of Mail Rail and Major Building Projects

The major building sites in the centre of London contribute significantly to the congestion problems of the capital. The Mole Solutions approach would involve:

1. Designing and constructing short tunnels to connect each major site in the form of a ring main
2. This ring main would be linked to the eastern section of the Mail Rail system which would then be used to remove spoil and deliver building products to the sites
3. On completion, the capsules and intermodal facilities would be converted to carry much of the goods destined for the City.

Ideally a comprehensive evaluation of the potential for freight pipelines within London needs to be undertaken to ensure that full account of planned and existing disused tunnels are included. In terms of prioritisation clearly the first priority should be to understand the potential of Mail Rail. The potential for using a Mole system to alleviate much of the traffic congestion caused by goods vehicles during the construction and operation of a regenerated Euston Station should also be examined as a matter of urgency given the recent publication of the High Speed 2 Bill.

Q3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Utilising the route to incorporate freight pipelines and multi utility trunking will provide new income from tolls paid for use of the pipeline, an increase in retail space from converting 'back store' storage space into retail, a reduction in the number of accidents, an improvement in the air quality and a reduction in road damage.

Q4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

- *What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?*
- *What innovative funding mechanisms could be considered to support delivery of key schemes?*

This question is to be addressed in the next stage of the Northampton Project, the comprehensive Business Plan. At this stage we are proposing to examine the concept of ‘who benefits pays’.

Q5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

London’s Mail Rail exemplified the benefits of freight pipelines from 1927 until the network was mothballed in 2003. It acted as inspiration for academic research in the concept in Germany, The Netherlands, New York, Beijing and Shanghai. It was designed in 1909 when congestion was a major issue but largely from horse drawn transport. The major west – east commercial axis that the system was designed to serve is still very important but it is essential to recognise the change and growth of London’s commerce. Therefore any development of the underground freight pipeline concept should begin with an understanding of what, and where, freight pipelines could be beneficially installed and the stages necessary to develop a fully functioning network.

Summary and Conclusions

This paper submits evidence to the NIC that the MSL freight pipeline concept can bring innovation and benefits to future UK and global transport systems in general and that of London in particular. UK government agencies have already invested in R and D projects that have proved both the concept and demonstrated the technology. A study of Northampton has shown that the business case for its use can be sound. Examples are given as to how the concept could be used in a number of current scenarios within future London transport schemes.

The next step is to embrace the concept as a significant input to future transport planning and integrate it as a complimentary feature with existing transportation infrastructure.

**Response to the National Infrastructure Commission Call for Evidence, 13th
November 2015**

***The Economic Case for using Fibre Reinforced Polymer (FRP) Composite
Materials in infrastructure Connecting Northern Cities, London's Transport
Infrastructure and Electricity Interconnection and Storage***

Pre-amble

This submission describes the role which Fibre Reinforced Composite (composite) materials could play in a variety of infra-structure applications related to Connecting Northern Cities, London's transport infrastructure and some aspects of Electricity interconnection, particularly low-cost pylons. We have therefore taken the liberty of sending this to the three email addresses.

The National Composites Centre

FRP composite materials are strong, light and highly fatigue and corrosion resistant. The UK is a world leader in the application of composite materials which are used in a wide and increasing range of applications. Their usage is forecast to grow in the UK up to six-fold by 2030¹, largely on the back of the need for a step-change in the fuel efficiency and emissions of all forms of transport equipment.

The NCC is part of the Innovate UK-sponsored High Value Manufacturing Network which aims to help UK companies bring better products to market more quickly. It operates in the gap between universities and the point where companies are confident enough to invest heavily in new technologies; this is often referred to as the 'valley of death'.

The Centre is one of the most capable of its type in the world. It has the latest full-size industrial equipment and approaching 200 staff with expertise in material selection, design, simulation, sub-scale and fully scale prototyping and testing. It is currently working with many of the UK's leading companies and universities to develop the next generation of aircraft wings, jet engines, lightweight cars, oil and gas structures and a host of other applications.

The NCC is a not for profit organisation and has been specifically established to develop cost effective products and, where necessary, work with regulators to develop new standards to provide end-users with the confidence that products are fit for purpose.

Introduction

There are extraordinary challenges in maintaining and upgrading the UK's existing infrastructure whilst boosting the capacity to meet the challenges of a growing and increasingly mobile population. In addition to efforts to boost house building, and general construction, there are plans for huge public and private investment in National Infrastructure from 2014-15 including energy, (£275bn), transport (£142bn) and water (£23bn) projects².

¹ 2015 unpublished UK Trade and Investment Report: Present and Future value of the UK composite market

² National Infrastructure Plan 2014, HMT, Dec 2014

In the 19th and 20th centuries, the UK was a pioneer and innovator in the development of rail, road, water, sanitation and power distribution infrastructure. Some of that original infrastructure is still in use today and although much of it is now in need of replacement, it is a testament of the quality of design and materials used.

Other infrastructure, much of it installed in more recent times, has fared less-well and requires significant inspection, maintenance and repair at significant cost.

Unlike some other parts of the world, composites are not widely used in UK for bridges, gantries and tunnel linings for which they are well suited. This has implications for taxpayers and the supply-chain which is under-developed relative to other industrial economies.

Composites materials could make a significant contribution to upgrading infrastructure which would cost less to buy, install and maintain throughout its life.

Transport Applications in the North of England and in the London area

The scale of the challenges faced by Network Rail, Cross Rail, Highways England, London Underground, and in due course, HS2 are immense. Network Rail has to maintain around 40,000 bridges and 900 tunnels, many dating back to Victorian times as well as thousands of pieces of trackside infrastructure such as platforms, roofs, signals and cabinets. Similarly, Highways England has over 8000 bridges and 4000 gantries amongst other assets valued at £110 billion³ and Local Authorities own an estimated 80,000 bridges between them⁴.

The international academic case studies in Appendix 1 show that composite bridges can achieve a total life-cycle cost savings (*excluding* installation and decommissioning) of around 40% compared to those using traditional materials. The National Composites Centre believes these are conservative⁵ figures in light of new composite manufacturing processes which have significantly reduced the initial cost of FRP structures.

The saving quoted do not include the costs of installing and commissioning the bridges which can be significantly lower than conventional bridges.

Composites are increasingly used internationally for tunnel linings (often using British materials) because of their resistance to water ingress and the speed of deployment.

Interestingly, a Technology Strategy Board funded competition led by London Underground and involving, amongst others, Atkins and the National Composites Centre, won the prestigious Stephenson prize in 2014 for developing a composite underground train door. It was estimated this would, if fitted to Central Line trains, save £5m pa in terms of lower energy costs, reduced track damage and the reduced time needed for passengers to get on and off the train⁶.

³ Meeting with Highways Agency

⁴ Highways Agency estimate

⁵ One rail industry consultant estimated that of the total 125 year life-cycle cost of steel infrastructure, only 10% was accounted for by the initial purchase price; the remaining 90% being for installation, inspection and repair.

⁶ www.nccuk.com

As an example of an extreme application in another sector, a National Composite Centre study established it is possible to produce very large offshore structure with a mass of just 10% of the existing design which would reduce deployment costs and eliminate the need for painting⁷.

Why use composite materials?

National infrastructure is expensive to build, install, inspect, maintain and repair. Much of it is built from steel and concrete, both of which are highly susceptible to corrosion. The Institute of Materials estimates the cost of this corrosion as being circa 3% of GNP or around £600 per person which is *'the equivalent to the entire infrastructure of the country disintegrating due to corrosion processes in about 30 years'*⁸

As well as having resistance to corrosion, composite structures are much lighter than traditional materials and can be installed quickly and with smaller (and cheaper) lifting gear. The footbridge at Dawlish railway station (which withstood the 2013 storm damage), is one of the few FRP bridges on the UK rail network due to its location in a salt-water environment.

It was installed during the course of one night with minimal disruption to the network. Similarly, a trunk road bridge in [Frampton Cotterell](#) in South Gloucestershire (which was assembled at the National Composites Centre and is shortlisted for a Prime Minister's award⁹) was installed over a weekend in the summer of 2014. Such bridges are the exception but do show that some infrastructure owners are willing to use them.

It is possible to fit sensors into composite structures to provide a remote structural health-monitoring capability. Whilst this would need to be undertaken as part of a wider systems-approach, it could help reduce the need for regular inspections in favour of a needs-based maintenance regime.

Barriers to the use of Composites Structures

The UK lacks a building code for composite bridges. This means that each one is custom designed and made as a one-off. Without a suitable code, there is no prospect of achieving the economies of scale needed for composites to be used routinely.

Some UK infrastructure owners have said that the importance of total life-cycle cost is not properly reflected in public procurement. One railways consultant¹⁰ estimated that the initial purchase price for a bridge was probably around 10% of the total life time cost over 125 years. Whilst this is purely anecdotal, it does indicate the importance of this issue.

These factors, and a degree of conservatism, are barriers to innovation and largely preclude the use of materials which could reduce the costs of maintaining the national infrastructure.

In contrast, the Netherlands has developed a very successful composite bridge industry. This was established to address the need for lightweight lifting bridges over the many canals and was facilitated

⁷ NCC report for a client

⁸ The Institute of Materials, Minerals and Mining <http://www.iom3.org/corrosion-committee/corrosion-committee-board>

⁹

[http://www.gazetteseries.co.uk/news/13803443.Innovative Frampton Cotterell bridge is shortlisted for national award/](http://www.gazetteseries.co.uk/news/13803443.Innovative_Frampton_Cotterell_bridge_is_shortlisted_for_national_award/)

¹⁰ From a UK rail consultancy as part of an NCC study into the application of composites in large structures, 2014

with the support of large orders from national and local governments (including the City of Rotterdam which ordered 200 bridges in 2011¹¹). A number of UK contractors have reported that Dutch suppliers can undercut them (by up to 70%) which illustrates a serious lack of capacity and capability in the UK supply-chain.

Conclusions and recommendations

After many years of under investment, the UK is investing heavily in a wide range of infrastructure which will be expected to perform well into the 22nd century. The Government has established the National Infrastructure Commission in recognition of the need to deliver affordable solutions to meet the UK's needs.

The conservatism of the specifiers, a lack of design codes and procurement rules which often penalise innovation, are impeding the adoption of composite infrastructure which could save their owners and ultimately UK tax payers significant sums of money.

The UK is a global leader in the design and manufacture of infrastructure and is missing an opportunity to meet the domestic challenges and address the export market.

Our recommendation to the Commission are therefore as follows:

- Work with infrastructure owners, suppliers and prospective supply chain companies, professional bodies and organisations such as the National Composites Centre to understand the potential impact of having composites as an alternative to existing materials for infrastructure;
- Work with regulators and codes/standards setting agencies to establish new & appropriate standards for the design, installation, maintenance and decommissioning of composites infrastructure.
- Review procurement process to chance give greater emphasis to through-life costs
- Investigate the steps needed to develop the capacity of the UK composites supply chain;
- Educate procurers, architects, designers and engineers in the value of the material;
- Fund collaborative research and development (CR&D), taking into account cross-sector knowledge, to examine materials, processes and high-volume manufacturing techniques.
- Develop training courses for the manufacture and commissioning of composite structures.

The NCC is keen to assist the Commission's any way possible.

Prepared by Graham Harrison, Strategic Partnerships Director, graham.harrison@nccuk.com

National Composites Centre, Bristol and Bath Science Park, Bristol, BS16 7FS

¹¹ http://www.fibercore-europe.com/index.php?option=com_content&view=article&id=345:200-composite-bridges-for-rotterdam&catid=25&lang=en&Itemid=262

APPENDIX 1:

Example of the use of composites in bridge applications

‘Composite bridges have very low weight and high strength to weight ratios, high tensile strength and high fatigue resistance. They do not exhibit chloride corrosion problems, which have been a continued challenge for bridge engineers. This results in lower maintenance costs. It has also been observed that FRP (fibre reinforced polymer) composites maintain their superior qualities even under a wide range of temperatures. Other highly desirable qualities of composites are high resistance to elevated temperatures, abrasion, corrosion, and chemical attack. Some of the advantages in the use of composite structures include the ease of manufacturing, fabrication, handling and erection which can result in short project delivery time’¹²

It is therefore strange that there are very few composite bridges in the UK compared to other developed countries in North America, Europe and Asia.

The major owners of the UK’s transport-related infrastructure have all explored the use of composite materials (Highways Agency has just 3 FRP footbridges) or are receptive to doing so¹³. The barriers identified to the widespread use of composites include: a lack of codes/ standards for composite bridges; a perception that they are expensive; a lack of composite designers; and as the industry itself admits, an inherent conservatism.

Cost

There is a significant body of evidence in the USA, some dating back to 2003, which compares the life cycle costs, which includes initial purchase cost, maintenance and disposal costs, of bridges built with concrete and composite decks over their anticipated life-spans. These suggest the cost saving by using a composite bridge over a 75 year life span could amount to 10%- 30%¹⁴. This is almost certainly, conservative in light of developments in the cost of composite bridges relative to concrete (below). Further these figures are for mixed material bridges and all-composite bridges could have even more significant advantages.

A Japanese report¹⁵ compared the costs of various types of concrete bridge decks (with varying degrees of corrosion protection) with a composite alternative. This showed that the composites option could be around 15% cheaper to buy than the most protected and expensive concrete option but its total ‘life-cycle cost’ over 100 years would be 24% cheaper. It is worth noting too that the *life cycle cost* was 40% less than a standard concrete bridge.

¹² Evaluation of the Economic Feasibility of Fiber-Reinforced Polymer (FRP) Bridge Decks, Sahirman, Creese, Setyawati. Industrial and Management Systems Engineering Department, West Virginia University, 2003

¹³ Meeting with Network Rail, Highways England, Crossrail and London Underground, September 2014

¹⁴ As footnote 5 above

¹⁵ A Case Study of Life Cycle Cost based on a Real FRP Bridge, Iishizaki, Takeda, Ishuzuka and Shiomura, Nagaoka University of Technology, and Public Works Research Institute, Tsukuba, Ibaraki, Japan

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Since these reports were published, there is significant evidence from studies, including one commissioned by the Highways Agency, which finds that composite bridges – if bought in batches of around 20 – can be *cheaper* to buy than equivalent concrete bridges. Undertaking a life-cycle analysis on this basis would suggest even more significant savings over the life of the asset.

It should be noted that the savings above do not take into account the time required to install or remove the bridges and the real costs of taking roads or railways out of commission for protracted periods of time.

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8 January 2016

National Infrastructure Commission call for evidence; Large-scale transport infrastructure improvements in London

Network Rail welcomes the opportunity to contribute to the call for evidence by the National Infrastructure Commission concerning large-scale transport infrastructure improvements in London.

1: Major Economic and social challenges facing London and its commuter hinterland

London's economy is continuing to grow, encouraging further population growth and demand for rail services within and beyond the capital.

The London and South East Market Study, produced by Network Rail on behalf of the industry, included a comprehensive review of the key drivers for future Rail growth, based around four scenarios determined by the trade-offs between the economy and social/environmental planning. In every scenario growth in employment in central London continues, reflecting London's unique status as a global employment market. The density of employment in central London is high, driving agglomeration and enhancing productivity.

This high density of employment in central London and the lack of capacity of the road network has created a strong market for rail travel, which is expected to grow further in line with increases in central London employment. The current mode share of rail, Underground and DLR for peak travel into London is 80%, and in recent years the number of people entering Central London by car in the peak has fallen – from 143,000 in 1996 to 64,000 in 2012. This is attributed to measures to improve bus and cycle flow (and safety) that have in effect reduced road capacity for cars, as well as to some extent the effect of the congestion charge. The need to cater for a growing commuter market amplifies the existing challenge of providing sufficient capacity for peak travel, which may remain underutilised at other times (although a growing economy should deliver increasing levels of disposable income which would encourage further off-peak travel).

The presence of employment attracts people to live in London, and the London Plan forecasts continuing high rates of population growth. However, given existing low levels of housing affordability and limited availability of land the likelihood is that many employees will be forced to live either in outer areas of the city or in the towns beyond the green belt. In both cases rail is well placed to meet this resulting commuting demand, as distances

become too long to be undertaken feasibly by other modes and, assuming roads policy remains broadly consistent, it is unlikely that sufficient road capacity will be available for journeys to be made by car. Network Rail is particularly conscious that, in addition to strategies which support investment in rail within London, it is critical that investment supports settlements beyond the city itself, given the significant proportion of the London employment market comprised of employees who live outside the city.

It is also anticipated that the number of Londoners in older age groups will increase, strengthening the need for investment to improve the accessibility of the transport system. A number of other demographic changes are identified in the London Plan. These include an increasing proportion of ethnic minorities and children, and the need to address continuing levels of social deprivation. Rail needs to carefully consider these factors and act to address them where it can.

Whilst accommodating demand for peak travel (particularly into Central London and Docklands) clearly poses the greatest capacity and connectivity issue for transport infrastructure, it is also vital that connections to international gateways (particularly airports but also HS1 stations) are maintained and improved. Providing sufficient connectivity to HS2 will also be a key future requirement.

2: Strategic options for future investment in London's transport

Network Rail believes that it is critical to the London and South East economy, and the wider UK economy, to continue with a rolling programme of enhancements to the rail infrastructure in and around the London area. The demand from passengers continues to grow, and both the general infrastructure and many specific train services are operating beyond capacity. Network Rail with industry partners has developed proposals to provide capacity to meet this growth through the Route Study process. During peak times service reliability is suffering already as passenger congestion becomes widespread at key stations as well as on the trains themselves.

To address this and to continue to support economic growth by providing improved rail services, these operational and capacity challenges will require investment in both the digitisation of railway network and conventional civil engineering focused infrastructure enhancements. In combination these will provide enhanced capacity, improved service reliability and better customer information.

A purely conventional strategy to meet demand – focused only on construction-based enhancements such as building new tracks – would cost too much, disrupt for too long, and deliver too little. Ultimately, London can only achieve the capacity its economy demands by complementing targeted infrastructure upgrades with digital innovation that makes existing infrastructure more effective. In particular our plans include proven innovations in signalling and train control. Our conventional infrastructure proposals tend to be limited as a result to tackling capacity challenges at key junctions and stations.

A number of stations in the London area are seeing levels of crowding that are seriously affecting passenger comfort and, ultimately journey times, so investment in enhanced station capacity will also be necessary to accommodate growing demand.

There is a growing difficulty of reliably operating the railway in London and the South East during the peaks given the volumes of passengers now using the railway. This challenge is most pronounced on the South West Main Line and the Brighton Main Line where, in the London area, trains and stations are becoming so congested that dwell times are being substantially impacted and the reliability of the operation compromised. It is Network Rail's view that investment in these Routes in the coming years will be necessary not just to avoid significant overcrowding, but also to avoid a deterioration in the reliability of these routes.

For each of these routes, a brief summary is provided below of the options available to release further capacity. In every case more detail can be found in Appendix A which also includes a link to each of the relevant Route Studies.

The South West Main Line:

This route provides the link between Dorset, Hampshire, Surrey and London. Options for releasing additional capacity are split over a two to three Control Period (2019 – 2030) timescale. CP6 proposals include improving Clapham Junction Station to relieve critical overcrowding on the platforms/underpass access and a flyover and additional platform at Woking to release capacity at the outer end of the route. CP6/CP7 proposals include roll out of the Digital Railway on the route with digital signalling critical to releasing the next tranche of Main Line capacity – up to 10 additional train paths per hour. Finally by the early 2030s the completion of Crossrail 2 will release further Main Line capacity and provide a step change in capacity and connectivity for south west suburban London.

The Brighton Main Line

This route provides the link between East and West Sussex, East Surrey, suburban South London and Central London. The integrated package of proposals for releasing additional capacity are split over two Control Periods (2019 - 2029) but are predominantly focused on the early 2020s. The key options involve remodelling the critical junctions north of East Croydon and providing 2 extra platforms at East Croydon station.

The Great Eastern Main Line

This route provides the link between Norfolk, Suffolk, Essex and Central London. The proposals for releasing capacity could all be deliverable in CP6 (2019-24) depending on the precise timing of Digital Railway implementation on the route. The integrated package includes rollout of digital signalling technology on the main line -providing substantial capacity benefits - particularly from Chelmsford inwards, the doubling of the single track bottleneck on the approaches to Norwich (at Trowse) and the introduction of a short section of additional track in the Witham area.

Greater detail on the proposals for each route into London are attached as Appendix A. These set out the level of industry involvement, appraisal processes used, key conclusions in terms of capacity gaps on the network, proposals for resolution, associated costs and where relevant business cases.

Key option outputs

Table 1 below sets out a high level summary of the key findings of the Route Studies in terms of options to resolve the most significant highlighted capacity gaps. The table also gives a sense of the level of additional seats to/from London during the peaks these routes could provide.

Table 1: Potential Outputs: Passengers. Peak direction of flow.

Service Group	Significant peak standing currently from:	Long term capacity gap*	Range of additional passenger capacity that could be delivered CP6	Range of additional passenger capacity that could be delivered CP7/8
South West Main Line (SWML) – Dorset, Hants, Surrey	Basingstoke/ Guildford (40 - 47 minutes out)	10,500 (high peak hour only)	-	4,600 – 9,300** (high peak hour)
Brighton Main Line (BML). Sussex, Surrey	Haywards Heath (50 minutes out)	12,900 (High peak hour only)	4,000 (high peak hour) 8,000 (3 hour peak)	8,000 (high peak hour) 16,000 (3 hour peak)
Great Eastern Main Line. Essex, Suffolk, Norfolk	Shenfield (30 mins out)	9,500 (High peak hour only)	2,400 (high peak hour) 4,800 (3 hour peak)	8,400 (high peak hour) 16,800 (3 hour peak)

*This represents the number of passengers in the high peak hour only that could not be accommodated on the route

** Does not include the additional suburban capacity – this is detailed in Appendix A

The options for the other key radial main line and suburban routes into London set out in Figure 1 are included in the Appendix.

Network Rail looks forward to working with the Commission and continuing to work closely with TfL and the DfT on the solutions to London's rail capacity and connectivity challenges.

3: Crossrail 2 – options to increase benefits and reduce costs

Crossrail 2 has the primary objective of improving public transport connectivity to key opportunity areas in London and the South East, promoting the economic growth in the region. The project will also address significant existing capacity constraints on the national rail network, particularly on the South West Main Line from London Waterloo, and the West Anglia Main Line from London Liverpool Street. The project is consistent with rail industry long term strategy set out in the London & South East Route Utilisation Strategy (RUS) of 2011, the recently established Wessex Route Study and the soon to be published Anglia Route Study.

Crossrail 2 is a substantial project with very significant benefits to the economy. Network Rail and TfL have agreed with the Commission to prepare a more detailed submission on Crossrail for 12th February 2016.

Yours sincerely,

A handwritten signature in black ink, appearing to read "Jo Kaye". The signature is fluid and cursive, with a large loop at the end.

Jo Kaye
Director, Network Strategy & Capacity Planning

National Infrastructure Commission
Call for Evidence

London's Transport Infrastructure
Nichols Response - January 2016



Question 3 – What are the opportunities to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Introduction

Crossrail 2 is a critical programme for London’s future economic and social sustainability. Its importance in solving the south-west commuter capacity constraints, unlocking land for affordable housing and its link to High Speed 2 at Euston, make it a regional and national priority delivering benefits beyond London. However whilst over half its estimated capital cost can be met by private funding sources the need for a strong Benefit to Cost Ratio (BCR) remains. Using our experience of numerous major rail and other infrastructure schemes, including 26 years working on Crossrail 1, we are pleased to have the opportunity to convey our thinking on how Crossrail 2 can increase its benefits, reduce its costs and meet its funding challenges.

A structured value management process to objectively challenge benefits and costs

The challenges can only be effectively addressed by adopting a structured and systematic value management (VM) process, which identifies solutions and objectively assesses them. We understand that TfL is leading this process, which should include other key stakeholders, including DfT, Network Rail, as well as its supply chain. Nichols staff led this approach on Crossrail 1, reducing capital cost to improve its BCR.

Opportunities to enhance benefits

The business case includes the transport, social, economic, regeneration and housing benefits. The VM process should ensure that each of these aspects are robustly challenged so that the wider, and sometimes less tangible, benefits in the business case are appropriately quantified and included. Conventional business case methodologies do not capture the transformational benefits associated with schemes such as Crossrail 2, nor the wider national benefits of supporting the growth of a global city. In this regard, Crossrail 2 could be used as a means of instigating a change to conventional business case methodologies.

Crossrail 2 can be used to further develop the proactive approach to realising socio economic development, seen on London 2012 Olympic and Paralympic Games and Crossrail 1, and should be positioned as a scheme benefiting the national as well as London economy. It should fund, in part, local representatives to act as brokers for opportunities with local suppliers for Crossrail 2. Therefore, the national economic supply chain benefits should be robustly reviewed. Creating a ‘push-pull’ effect in the regions is critical to ensuring robust advocacy for the Crossrail 2 in regional economies.



Crossrail 2 creates construction jobs and will support building a skills legacy; these are areas which require robust quantification and inclusion in the business case. Supply chain advocacy needs to be harnessed to ensure a weight of support for the scheme, ensuring a strong link with the Government’s transport and infrastructure skills strategy being led by Terry Morgan.

We previously convened a “Creative London Crossrail 2 initiation seminar” which included key stakeholders to Crossrail 2, as well as those involved in Crossrail 1 and other major programmes. A key theme which emerged from this seminar was the importance of any scheme having ‘strategic anchors’. In part, Crossrail 2 has these strategic anchors in relation to important developments at Euston (with HS2), Clapham Junction (through its proximity to Nine Elms development) and Wimbledon as an emerging opportunity area. However, unlike the Jubilee Line Extension and Crossrail 1, where the links to Canary Wharf were key anchors, Crossrail 2 does not appear to have such a key anchor. This is important from an economic justification perspective, and for leveraging private funding. We therefore recommend a review of Crossrail 2 route and station locations to take account of likely post Crossrail 1 centres of economic activity.

An alternative approach would be to build those parts of the railway that are mainly intended to link to new housing only when there is demand, similar to how the Metropolitan line expanded over an extended period. Where the business case is not strong, for example, the new Southgate branch, demand could be demonstrated by a substantial contribution from the housing developers who could be encouraged to progress developments through efficient use of the Mayor’s planning powers. A similar approach occurred on Crossrail 1 at Woolwich, which only acquired a station when a developer contributed to its costs, in turn linking the development to obtaining planning consents for a large housing scheme. The sale or lease of development land could also be used to generate capital or revenue receipts to off set costs.

Benefits can also be enhanced by designing additional functionality from the start. For example, full integration of oversite and associated urban realm developments, geothermal heat recovery or protected duct routes for voice and data connectivity, which could generate long term revenue streams.

Opportunities to reduce costs

Opportunities to reduce cost in a generic sense will already be well recognised, including: reducing risk; improving incentivisation of suppliers; use of standardised designs; benefits of off-site manufacturer; application of BIM as a single source of truth; and value engineering of high risk and sensitive locations (such as shafts).



From our involvement in the planning and delivery of major rail and other infrastructure programmes, we recommend exploring the following additional ideas to reduce cost:

- EU procurement regulations impose an unnecessarily constraint, they do not provide adequately for the acquisition of a Programme. Each ‘call for competition’ is independent and cannot sufficiently allow for externalities that in practice erode value and build in redundant costs. We would advocate exploring opportunities to create an entity which is classified as ‘private’ and therefore does not need to comply with EU procurement regulations. The obligations of transparency and prevention of fraud and corruption would still be maintained to ensure fair and equitable competitions.
- The development and management of the outer areas works, on the existing rail network, should be fully integrated with the management and development of the core route. This would be maintained under TfL’s overall leadership ensuring that all activities are integrated and opportunities to challenge scope, reduce risk and drive economies of scale are taken.
- Ensuring that wider industry opportunities to reduce risk and enhance value are taken in a system-wide structured manner. For example, ensuring that the DfT, as franchising authority, factor into the South West trains franchising process the potential for Crossrail 2’s impact on the network. In a similar vein, our work on the Thameslink Franchise ensured that the TOC would play a key role in delivering and facilitating the programme through both contractual obligations and aligned incentives with Network Rail and the train service provider.
- Phasing should be explored, as an incremental approach to delivery may result in efficiencies. There is evidence from Madrid and other successful metros of keen pricing from such approaches.
- Different delivery models should be considered, particularly for off-network aspects of scope such as depots and stations. Depots and rolling stock could be privately financed, generating affordability benefits which could assist the programme’s Benefit Cost Ratio.
- From our experience of Crossrail 1, cost reduction opportunities exist through innovation, and the programme must proactively seek to generate, capture and deploy innovation. This innovation should be delivered through a platform similar to Innovate18 or a discrete Innovation Engine.
- Procurement efficiencies through smart packaging and building a liquid supply chain. On Crossrail 1, the use of larger construction packages generated savings and reduced interface risk.



Nissan response to the National Infrastructure Commission call for evidence

Nissan will provide a response that focuses on two questions of the questions that have been asked around the report regarding transport infrastructure in London. These are:

- 1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?**
 - 2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?**
- *How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?*
 - *What might their potential impact be on employment, productivity and housing supply in London and the southeast?*

London report response

One of the main social challenges London faces, and will continue to face over the coming decades, is improving air quality in a city that is expected to grow from its current record population high of 8.6 million, to 11 million by 2050.¹ While estimates vary, some studies show that air pollution in the UK currently kills over 35,000 people every year.² The UK exceeds EU limits on NO₂ pollution, and because of its size London is by far the most polluted city. Around 80% of the NO_x emitted in London comes from transport; for a cleaner, healthier London, improving emissions from vehicles is therefore vital.

At the heart of the strategy to improve transport emissions is the transition to Ultra Low Emission Vehicles (ULEVs). ULEVs emit much lower levels of NO_x and CO₂, and pure Electric Vehicles like the Nissan LEAF have zero tailpipe emissions – zero NO_x and zero CO₂. TFL's Ultra Low Emission Zone delivery plan of June 2015 sets out to make London the ULEV capital of Europe. This is both welcome and necessary. Not only does London currently fail to meet EU legal limits for nitrogen dioxide, but there is also much more to do on CO₂ if we are to meet the internationally agreed targets set at COP21 in December 2015. Investing in the necessary charging infrastructure to support ULEVs will therefore help improve air quality – and consequently public health – whilst also helping the UK meet our carbon emissions targets.

TFL's ULEZ delivery plan also makes the point that the "green economy" is a rapidly growing industry; investing in the right infrastructure to support ULEVs not only improves the air we breathe, it is an investment in the jobs of the future.

TFL have combined with the GLA to look at potential ULEV uptake in London. There have been more than 30,000 ULEVs purchased in the UK to date and the last 2 years has seen a surge in market

¹ <http://www.bbc.co.uk/news/uk-england-london-31082941>

² <http://alumni.kcl.ac.uk/page.aspx?pid=4358>

growth. Even the “baseline scenario” projections show a 25-fold increase in ULEV cars in London in the next 10 years.³

To cope with this anticipated increase in demand London’s electric vehicle charging infrastructure needs improvement. ULEV users must have the confidence that they will be able to easily recharge across the city. Nissan appreciates that TFL is currently undertaking research to best understand what infrastructure will be needed to support ULEV uptake; Nissan would advise the commission to follow this research closely in their work. However without wishing to pre-empt this study, Nissan would suggest that as the areas of Old Oak Common and the industrial Park Royal site in West London are regenerated as part of the introduction of HS2 and Crossrail, electric chargers should be installed. Indeed Nissan believes that the installation of chargers – preferably rapid chargers - should be standard for any future regeneration project in London and recommends that planning authorities should require investment in charging infrastructure as part of any major housing developments in the capital.

However most importantly TFL must have the resources they need from Government to provide the necessary infrastructure. This is required on a large scale to achieve the improvements in levels of NOx and CO2 that the UK is legally obliged to. Whilst public transport, walking and cycling will continue to play an increasing role in London’s transport landscape, and investment in large scale public transport projects like Crossrail 2 is necessary, it is important to remember that 1 in 3 journeys are still made by private transport.⁴ For many businesses private cars and vans will remain the only way of operating. The transition to ULEVs will therefore make sure businesses can continue to operate as they currently do, enabling economic growth and improving productivity, whilst ensuring the UK meets its legal obligations to drive down emissions and improve public health. The Government’s stated ambition is that by 2050 almost every car and van in the UK will be an Ultra-Low Emission Vehicle – this ambition must be backed by the resources to enable the roll out of a reliable and easily accessible charging infrastructure across London.

³ <http://content.tfl.gov.uk/ulev-delivery-plan.pdf>

⁴ <http://content.tfl.gov.uk/ulev-delivery-plan.pdf>

1. Introduction

- 1.1 Peabody was established in 1862 by the American banker and philanthropist, George Peabody. Our mission is 'to make London a city of opportunity for all by ensuring that as many people as possible have a good home, a real sense of purpose and a strong feeling of belonging.'
- 1.2 We work solely in London, with a presence in the majority of London boroughs. We own and manage around 28,000 homes, providing services to over 80,000 Londoners. This is set to grow with over 8,000 new homes planned across the capital.
- 1.3 As well as bricks and mortar, we provide community programmes for the benefit of our residents and for people living in the surrounding neighbourhoods. We support over 23,000 hours of free-to-access community activities each year. This work aims to tackle poverty at its roots, supporting people to transform their lives and communities for the better.
- 1.4 Peabody is growing and has ambitious plans for the regeneration of Thamesmead, south east London. For the first time in a generation, the organisations responsible for housing, land and community in this area have been brought together into a single, well-resourced organisation. Over the next 10 years we will work with partners and local people to translate our vision of a mixed, economically active and vibrant Thamesmead community into reality.
- 1.5 Developing London's transport infrastructure is essential in order to deliver a major uplift in housing delivery and create significant economic benefits to regeneration areas. We believe that Peabody's role in Thamesmead presents one of the biggest opportunities to tackle London's housing crisis. Thamesmead has the potential for between 15,000 and 20,000 new homes, as well as 6,000 to 8,000 new jobs. Fulfilling this potential will depend on the provision of new transport infrastructure, particularly new river crossings and extension of the DLR from Gallions Reach.
- 1.6 New river crossings and extension of the DLR from Gallions Reach are crucial to delivering the full potential of Thamesmead. They will enable a step change in the connectivity of public transport for those living in parts of central and north Thamesmead and have the potential to act as a catalyst for attracting external investment. We ask the Commission to recognise the growth potential of Thamesmead and the potential for a major uplift in housing delivery through new river crossings and a DLR extension.
- 1.7 Our response relates to Section 3 of the call for evidence, 'London's transport infrastructure'. We have chosen to respond to questions 1 and 2 of this section as these most closely relate to Peabody's core purpose and future plans.

2. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

Summary

- London requires a major uplift in housing delivery in order to address the current housing crisis and to secure the city's future growth.
- We believe that Peabody's role in Thamesmead presents one of the biggest opportunities to tackle London's housing crisis. Thamesmead has the potential for between 15,000 and 20,000 new homes, as well as 6,000 to 8,000 new jobs.
- New homes must include a mixture of tenures in order to effectively meet housing need in London and must be integrated with new and existing infrastructure (e.g. schools, health, community and transport) in order to create successful and sustainable communities.

Population Growth

2.1 London's population is currently growing at a rate of around 100,000 people a year and recently reached a record high of 8.6 million people.¹ Continued population growth is expected to occur over the next two decades with London's population forecast to reach 10 million people by 2030.² This population growth has mostly been driven by natural replacement and international migration.

2.2 Peabody recognises the continuing growth in London's population and works closely with the GLA, local authorities, private developers and other housing associations to increase the number of homes available for Londoners. We are also committed to ensuring homes built are connected to the social infrastructure that allow them to make great places to live. This includes educational facilities, health services and community amenities, as well as transport links.

Economic Growth

2.3 London's population growth is fuelled by a strong economy. The city's economy grew by almost 30% over the five years to 2014.³ London creates almost 200,000 new jobs annually⁴ and the median weekly wage for full-time employees in London is £132 per week more than the UK average.⁵

2.4 London's job growth is forecast to continue over the coming decades, particularly in high skill sectors, such as professional services and technical activities. Continued employment growth is also forecasted in low skill sectors, such as retail and social care, which can have limited opportunities for career progression and wage growth. This has resulted in a polarisation of the city's labour market and led to some research suggesting London is the most unequal city in the UK with regards wage inequality.⁶

¹ Source: GLA, *London population confirmed at record high* (2015)

² Source: Mayor of London, *The London Strategic Housing Market Assessment* (2013)

³ Source: ONS, *London leads UK cities in economic recovery* (2015)

⁴ Source: Mayor of London, *The London Strategic Housing Market Assessment* (2013)

⁵ Source: ONS, *Annual Survey of Hours and Earnings* (2015)

⁶ Source: JRF, *Wage inequality and employment polarisation in British cities* (2013)

- 2.5 It is anticipated that much of London’s future population growth and economic growth will take place in the east, especially in Opportunity Areas such as Thamesmead. This is because these areas have a greater supply of developable land, including brownfield sites, and significantly cheaper land costs. However, areas such as Thamesmead have also been historically underserved by London’s transport infrastructure. The GLA has recognised this and recently launched their City in the East plan to enable the provision of critical infrastructure necessary to support future growth in housing and jobs.
- 2.6 Given the challenges in London relating to the availability of land, we strongly believe that Opportunity Areas such as Thamesmead present one of the biggest opportunities to tackle London’s housing crisis. See point 3 for further information on the opportunity presented by Thamesmead.

Housing (Under)Supply

- 2.7 London’s housing supply has persistently failed to match its population growth leading to the situation popularly characterised as a “housing crisis”. At least 49,000 additional new homes are required in London annually over the next two decades to meet housing need,⁷ whilst just 21,000 new homes were completed in London over 2014/15.⁸ This undersupply of homes has been attributed to a range of causes, including constraints within the planning system, the availability and high costs of land, access to finance, and the make-up of the house building sector.
- 2.8 It is forecast that nearly half of the homes required in London over the next two decades will be for market rent/sale, one in five will be for low cost home ownership, and a third will be homes for social rent. London’s annual housing requirement also includes 5,000 homes a year to address backlog housing need among households currently living in unsuitable accommodation.⁹
- 2.9 Peabody strongly believes that London needs a mix of housing tenures to effectively tackle the housing crisis. Although we welcome the government’s planned investment in house building, we are concerned that current policy has insufficient emphasis on the demand for new affordable homes to rent. We remain committed to developing high quality new homes across a range of tenures, including social/affordable, as well as homes for rent and sale on the open market. Peabody’s recent housing developments, such as Chambers Wharf in Southwark, Mint Street in Tower Hamlets, and Pembury Circus in Hackney, all demonstrate this commitment.

Housing Affordability

- 2.10A long-term shortfall in housing supply has led to significant increases in house prices. This has been apparent over recent decades in which London’s house prices have increased much faster and higher than in other parts of the UK. London’s average house price has more than doubled since the late

⁷ Source: Mayor of London, *The London Strategic Housing Market Assessment* (2013)

⁸ Source: Ibid.

⁹ Source: Ibid.

1990s and trebled since the mid-1980s.¹⁰ The average house price in London is currently £531,000, having risen by over 7% over the last 12 months. This is £245,000 higher than the rest of the UK.¹¹

2.11 House prices in London have risen much faster than earnings since the recession. London's average house price is currently sixteen times average earnings, compared with a ratio of 11:1 in the rest of the UK. This has created a significant problem of affordability, especially for aspiring home owners, and has increased demand for rented housing.

2.12 Average rental costs in the private rented sector are higher in London than other UK regions and have grown by over 4% over the last 12 months.¹² The median private rent in London for 2014/15 was £1,350 per month, compared with just £600 per month on average across England.¹³

2.13 The high costs of rent and home ownership have created affordability problems for many households, especially large families. One key consequence of this is the extent to which social diversity has been impacted, with many individuals on low-to-middle incomes being effectively priced out of living in many parts of London, especially inner London. This also affects the ability of employers to recruit workers in key professions due high housing costs. A recent CBI survey found that 61% of the capital's firms list housing costs and availability as having a negative impact on the recruitment of entry level staff, with half listing it as an issue for recruiting mid-level managerial staff.¹⁴

Transport Infrastructure

2.14 The continued growth of London places a higher level of demand on existing social and physical infrastructure, including transport. London's future population growth depends not just on the provision of new homes and jobs but also on the provision of sufficient transport capacity and connectivity to effectively link new homes with jobs.

2.15 Through addressing the pressures faced by London's transport infrastructure we could better support London's continued economic growth through productivity gains and job growth. Such improvements would also help to drive new housing development and regenerate key opportunity areas, such as Thamesmead. The use of transport infrastructure to drive growth across London is well established through initiatives such as the Northern Line Extension to Battersea, where 18,000 homes will be built in the GLA led Vauxhall Nine Elms Opportunity Area.

¹⁰Source: Ibid.

¹¹ Source: ONS, *House Price Index*, (2015)

¹² Source: ONS, *Index of Private Housing Rental Prices* (2015)

¹³ Source: VOA, *Private rental market statistics* (2015)

¹⁴ Source: CBI, *London Business Survey* (2014)

3. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

Summary

- Developing London's transport infrastructure is essential in order to deliver a major uplift in housing delivery and create significant economic benefits to regeneration areas.
- We believe that Peabody's role in Thamesmead presents one of the biggest opportunities to tackle London's housing crisis. Thamesmead has the potential for between 15,000 and 20,000 new homes, as well as 6,000 to 8,000 new jobs. Fulfilling this potential will depend on the provision of new transport infrastructure, particularly the extension of the DLR from Gallions Reach.
- New river crossings and extension of the DLR from Gallions Reach are crucial for delivering the full potential of Thamesmead. They will deliver a step change in the connectivity of public transport for those living in parts of central and north Thamesmead and have the potential to act as a catalyst for attracting external investment.
- Peabody asks the Commission to recognise the growth potential of Thamesmead and the potential for a major uplift in housing delivery through the delivery of new river crossings and a DLR extension.

Thamesmead's growth potential

- 3.1 Thamesmead is a part of the GLA 'City in the East' Plan. Originally conceived as a new town for the 21st Century, Thamesmead has experienced mixed fortunes since the first families moved in in 1968. Many parts of Thamesmead have suffered from inconsistent governance, investment and management and it still suffers from poor connectivity and accessibility, exacerbated by an historic lack of transport infrastructure investment in comparison to other areas of London.
- 3.2 The poor provision of transport infrastructure has constrained development potential and the vitality of existing communities and employment areas. The locality has relatively low levels of income compared to the rest of London (for example, average household income in South Thamesmead is £37,652pa in comparison to an Outer London average of £48,530pa) and is in need of economic regeneration.

Peabody in Thamesmead

- 3.3 In 2014 the major landholdings and corporate responsibilities for Thamesmead were transferred over to Peabody, putting us in a unique position to facilitate a process of transformational change for the area. We have ambitious plans to regenerate the area into a high quality place to live, work and visit.
- 3.4 We have worked with Royal Borough of Greenwich and London Borough of Bexley to secure government investment into Thamesmead through the establishment of two Housing Zones, in addition to our own substantial investment. Working with our partners we are committed to delivering thousands of high quality affordable homes, with the first homes being delivered in the next five years.
- 3.5 Peabody is clear that Thamesmead is a community with huge growth potential and we have demonstrated our ambitions by committing to delivering a substantial regeneration programme.

Funding commitments from the two Housing Zones and other sources of investment are expected to result in £1.4bn worth of investment in the regeneration of Thamesmead. However, the full development potential of Thamesmead can only be unlocked with enhanced public transport and substantial investment in transport infrastructure.

- 3.6 The arrival of Crossrail to Abbey Wood in 2018 will significantly improve public transport accessibility for South Thamesmead and will enable the regeneration of key neighbourhoods around the station. However, strategic transport connections are still lacking across much of central and northwest Thamesmead. In order to maximise the impact of Crossrail and the development opportunity of the whole of Thamesmead, a co-ordinated programme of transport investment is required.
- 3.7 New river crossings, a DLR extension and improved local transit connections will deliver a major uplift in housing delivery in Thamesmead. Crossrail will bring 25,000 residents in Abbey Wood/South Thamesmead closer to central London with the ability to reach Canary Wharf in 11 minutes and Tottenham Court Rd in 24 minutes. This however, will not significantly improve the connectivity of 15,000 residents of North and Central Thamesmead (due to slower connections to Abbey Wood station), nor will it allow Peabody to bring forward significant land holdings for development in North Thamesmead.
- 3.8 The London Plan currently identifies a possible 3,000 new homes which are deliverable in Thamesmead, whereas the work Peabody has done with the GLA/TfL and the two Boroughs demonstrates the potential of between 15,000 and 20,000 new homes, as well as associated commercial development, including a new town centre for Thamesmead, if the requisite transport infrastructure can be provided. Clearly, transport infrastructure can more widely benefit an area than simply resolve transport problems.
- 3.9 New river crossings will be essential to attract the necessary investment to fulfil the development potential of Thamesmead. The increased connectivity will ensure Thamesmead becomes an integral part of London, providing the right conditions for attracting private sector investment in both residential and commercial developments.

Potential for further growth – key transport interventions for Thamesmead

3.10 Peabody's vision for Thamesmead is the creation of first-class transport connections that provide excellent connectivity into central London, to the wider region, opening up new routes into Kent, and within Thamesmead itself. This will unlock future development sites and encourage a greater level of investment within the area. We have identified the following key transport interventions:

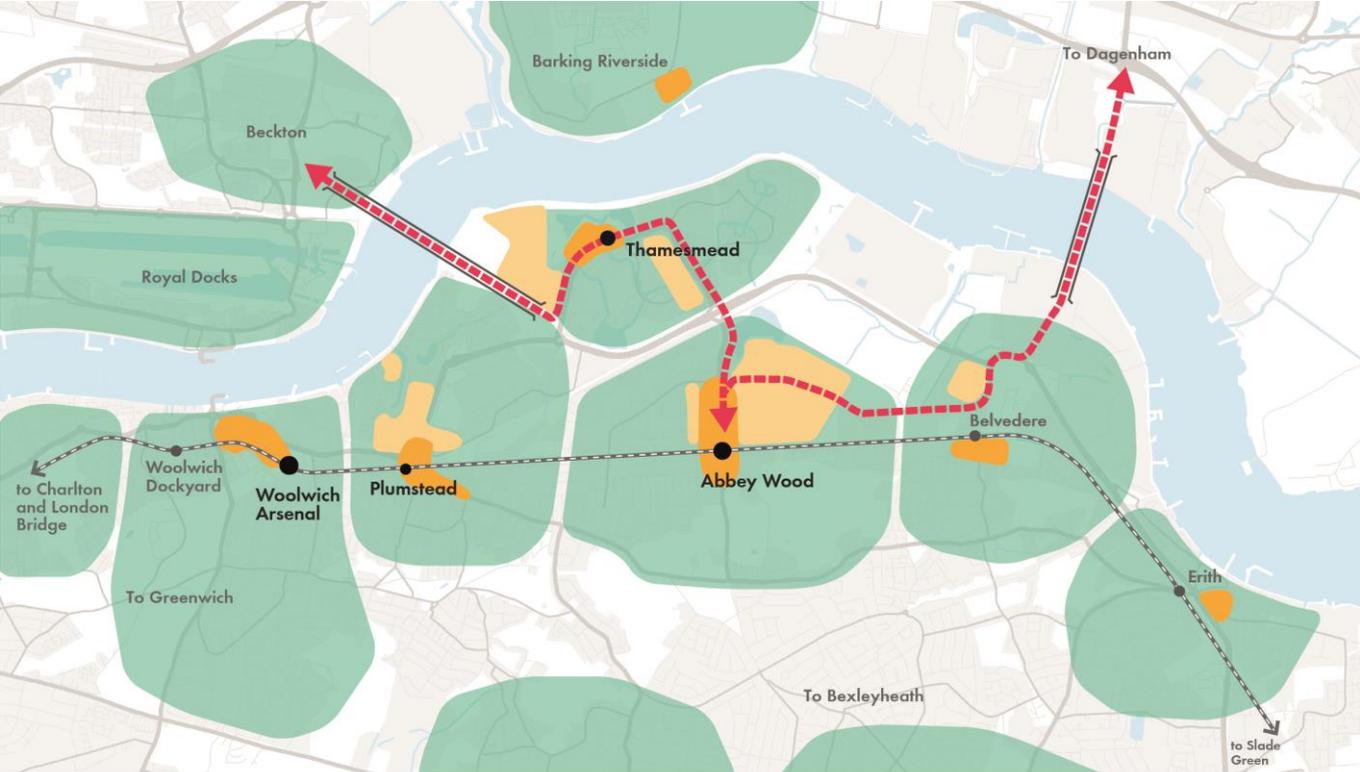
- (1) River crossings:** A new river crossing at Gallions Reach would enable the comprehensive development of Peabody controlled sites in north and central Thamesmead, including Tamesis Point and the town centre. The crossing would play a key role in unlocking development potential, enhancing values and deliverability, and enabling residents to access employment opportunities in key employment locations such as the Royal Docks and Canary Wharf.

Our preferred option for the river crossing at Gallions Reach is a tunnel. We believe that a tunnel would have a number of advantages over a bridge as this would have a lesser impact on nearby residents and would enable the development of a higher volume of new homes compared to a tunnel. Peabody will be further outlining our case on this matter in the TfL river crossings consultation.

A new crossing at Belvedere would also support businesses, job creation and housing delivery for local people. It would also improve business productivity and output as a result of better connectivity, agglomeration and increased competition (see *Figure 1 below*).

Figure 1. River crossings

Indicative plan showing proximity of major development sites in Thamesmead to proposed Gallions Reach and Belvedere river crossings.



- Key
- Existing rail network (and Crossrail to Abbey Wood from 2018)
 - Proposed river crossings and strengthened public transport routes

(2) DLR: The extension of the DLR Beckton branch to Thamesmead over Gallions Reach crossing would transform the accessibility of north and central Thamesmead, improving local journeys and creating connections to areas of economic growth in Docklands. It would also act as a catalyst to the comprehensive development of key strategic sites increasing the ambition, deliverability and development potential of these sites. There is potential to achieve a further

extension from central Thamesmead towards Belvedere which would also be of major benefit to housing and employment sites in Bexley and Thamesmead.

We believe that the potential number of new additional homes which would be enabled by an immersed tube DLR transport option at Gallions Reach has so far been underestimated. Our estimates suggest that this option would enable the delivery of 7,800 new homes within the vicinity of the DLR station, with the potential for more depending on densities.

A DLR extension from Beckton to Thamesmead would also reduce journey times from the Town Centre to Bank (from 59 minutes down to 32 minutes) and to the Royal Albert Dock (from 64 minutes down to 8 minutes), thereby opening up accessibility to jobs and linking key development schemes north and south of the river (see Figure 2 below).

Figure 2. DLR Extension

Illustration of DLR extension providing a direct link from central Thamesmead to the Royal Docks, Canary Wharf and the City.



- Key
- Existing DLR
 - Existing rail network
 - Crossrail to Abbey Wood from 2018
 - - - Proposed DLR extension
 - - - Proposed river crossing at Gallions Reach and improved public transport route
 - - - Potential future phases of DLR extension (indicative routing)
 - Improved connections from Woolwich/Plumstead to Abbey Wood and LB Bexley

(3) Overground extension: The extension of overground services from Barking would connect the area into a new orbital network of outer London centres for the benefit of central Thamesmead and Bexleyheath. An extension of Crossrail to Ebbsfleet would also be beneficial in the long-term (see Figure 3 below).

Figure 3. Overground extension

Illustration of the Overground extension providing a link from the Crossrail station at Abbey Wood to central Thamesmead and Barking Riverside.



- Key
- Existing DLR
 - Existing rail network
 - Crossrail to Abbey Wood from 2018
 - - - Potential future Crossrail extension to Ebbsfleet
 - Potential London Overground extension from Barking Riverside to Abbey Wood
 - - - Potential London Overground route via Thamesmead town centre and Bexleyheath

(4) Local transit (east to west): Improved transit connections in the form of tram or enhanced bus services would play a vital role in improving local journeys from east to west between Woolwich and Abbey Wood. Other connections or interchange could be achieved via the new river crossings to connect into the Royal Docks and London Riverside.

(5) River bus: An extension of river bus services from Woolwich via Tamesis Point/Thamesmead Town Centre and beyond would provide a further connection to a number of destinations in central London.

4. Conclusion

- 4.1 Peabody welcome further opportunities to contribute to the debate on London's transport strategic challenges. We ask the Commission to recognise the growth potential of Thamesmead and the potential for a major uplift in housing delivery through the delivery of new river crossings and a DLR extension.
- 4.2 Since our merger with Gallions in 2014 we have committed substantial investment in development work and detailed studies identifying the overall potential of Thamesmead. We would welcome discussions with the Commission and TfL in regards to future pieces of work, particularly relating to new river crossings and a DLR extension.

For further information, please contact:

[contact redacted]



PENSION INSURANCE
CORPORATION

*Response by Pension Insurance Corporation plc to the National
Infrastructure Commission call for evidence*

8 January 2016

Contact:
[contact redacted]

Pension Insurance Corporation does not regard any of the information in this document as confidential.

Introduction

Pension Insurance Corporation plc (PIC) provides tailored pension insurance buyouts and buy-ins to the trustees and sponsors of UK defined benefit pension funds.

Clients include FTSE 100 companies, multinationals and the public sector. At year-end 2014 PIC had a portfolio of £13 billion and approximately 30% of this, or about £4 billion, was invested in infrastructure debt. PIC now has more than £16 billion in assets. The vast majority of the balance is invested in investment grade corporate bonds, UK Government debt and cash.

PIC is authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and Prudential Regulation Authority (FRN 454345).

For further information please visit: www.pensioncorporation.com

Our interest in this consultation

As a specialist pension insurer with liabilities analogous to those of a defined benefit pension fund, we look to buy and hold assets which provide long-term, stable cash flows which match the underlying liabilities of the pension schemes we insure. The regulatory environment is driving demand for these cash-flows to come in the form of investment grade debt. Our

portfolio is therefore principally invested in assets such as UK government debt, corporate bonds and cash.

One of the key facets of our portfolio is the very long-term, non-callable nature of the liabilities insured by PIC. This means we can invest in illiquid assets which are, by definition, hard to sell. A good example of this is infrastructure debt.

Infrastructure debt can offer investment grade, inflation-linked, long-term cash flows to match liabilities. It offers high recovery rates even in default, above similarly rated corporate bonds. An increase in availability of this type of investment would allow more pension liabilities to be matched. Given there are around £2 trillion of corporate defined benefit pension liabilities in the UK, there will be substantial demand for assets.

However, the UK is suffering from a major “infrastructure gap”, in that there are huge infrastructure demands within the economy and increasingly interested and cash-rich institutional investors, such as PIC, yet a dearth of suitable investments, notwithstanding the plans for the ‘Northern Powerhouse’.

A more stable and strategic approach to infrastructure planning and delivery by government would go a long way to helping grow GDP and produce secure investments at attractive yields for pension funds, insurance companies and other UK institutional investors.

We welcome the creation of the National Infrastructure Commission (NIC) as a step towards improving the investment environment and welcome this opportunity to contribute to the public discussion about infrastructure.

We believe a key objective of the NIC should be to build and then maintain a healthier ongoing dialogue between infrastructure planners and the UK funding markets. In our view there has been a strained relationship in the past, which is now improving. As institutional investors become an increasingly important part of the funding equation, there is a real opportunity now for a more collaborative approach.

As natural lenders we want government to understand what is important for us and to above all ensure consistency in its approach. The key aspect for long-term investors is long-term certainty and visibility of the cash-flows.

Most infrastructure projects are long term in nature, so the governance needs to reflect this.

This in contrast to short term political cycle so the governance needs to be de-politicised as far as possible, something we considered as part of a detailed study of UK infrastructure we undertook with Llewellyn Consulting in 2013.¹

This de-politicisation of the process has been done before with the removal of interest rate setting to the Bank of England.

¹ <https://www.pensioncorporation.com/news-media/news/pension-insurance-corporation-launches-white>

The NIC is able to take a longer view and create greater certainty for all interested stakeholders – consumers, construction industry, other industry participants such as facilities management companies, local government and the financing market.

This could be a win-win situation for the UK, a serial under-investor in infrastructure. At a time when the need for infrastructure investment has never been greater and the desire of institutional investors is correspondingly strong, it is time to ensure that these pools of money can be put to work rebuilding Britain.

The role of governmental bodies must be to facilitate the development of private capital funding, not replace it except when a project is not viable without governmental support or subsidised funding. They need to act as facilitators of projects and they can use guarantees and involve supranational bodies in the financing.

As noted, there is a very large demand for long dated high quality assets from UK institutions. Yet there is also a real ongoing risk of crowding out by supranational issuers such as European Investment Bank, who are able to offer cheaper debt.

An excellent example of successful facilitation by the government was Mersey Bridge, where the deal only obtained finance because of the Government's guarantee.

We confine our comments only to those areas in which we have a particular interest and expertise, namely those that relate to the governance and financing of infrastructure projects.

PIC is a consistent innovator in the field of infrastructure investment

- PIC invested in the first-ever UK Solar Bond financing in November 2012.
- PIC invested in Salford Pendleton Social Housing PFI debt which had project bond credit enhancement via mezzanine financing – this was before the European Investment Bank (EIB) had placed their first deal within the UK with a similar financial structure.
- PIC adopted a deferred funding model, where funding is being drawn down over three years in line with the construction profile, with its North Tyne social housing PFI transaction.
- PIC lent £70 million to the Church of England Pensions Board, which operates the Church's retired-housing scheme, in a new source of long-term financing for the Church housing scheme. The bond is the first ever Sterling issue with the coupon but not the principal linked to CPI and represents a step forward in the CPI linked bond market.
- PIC invested £75 million in debt issued by Virgin Atlantic Airways, secured on its portfolio of landing slots at Heathrow, the first time that this type of transaction has been completed.
- PIC has invested more than £1 billion in bilateral infrastructure transactions in sectors including utilities, transport, renewables, social housing, PFI and student accommodation.
- PIC has been involved in loan and bond funding for a number of primary deals, including investing in over £400m of transactions that have significant greenfield or construction risk.
- PIC has been involved in funding consortia for transactions working alongside banks, other insurance companies and other leading counterparties active within infrastructure in the UK.

- PIC provided around £150 million of funding as the key investor for two PFI bonds in Greater Manchester providing funding for Salford City Council to begin regenerating more than 1200 homes in the city and then funding for Manchester City Council to begin regenerating more than 1100 homes in the Brunswick area of the city.
- PIC is invested in long-dated fixed, floating and inflation-linked debt and works closely with borrowers to offer their preferred funding solution.

Connecting northern cities

What form of governance would most effectively deliver transformative infrastructure in the north, how should this be funded and by whom, including appropriate local contributions?

GOVERNANCE

The importance of governance

From an investor perspective, strong governance that brings long-term certainty and visibility of the cash flows is critically important, as it helps ensure:

- investment programmes have public support, therefore minimising the risk of policy reversal or abandonment;
- taxpayers receive value for money, underpinning the fiscal credibility of investment programmes;
- private investors have sufficient confidence in project management to provide early stage equity finance;
- where applicable, infrastructure assets are economically viable such that private investors can purchase bonds at project maturity;
- where there are guarantees or tariff regimes they will not be altered.

Key investor infrastructure investment governance issues

Certainty is important because investing in infrastructure is a complex area. This complexity is a significant barrier for many pension funds. It takes time and effort to build up the expertise and partnerships necessary to successfully invest in this area. Investors need to have the resources and ability to analyse:

- Credit issues
- Structure deals
- Price deals

They need to be confident that the time they spend looking at an opportunity and the effort expended in acquiring skills and resources to analyse the deal will be worth it. A lack of certainty in the process can undermine the desire of certain types of institutional investor, in particular pension schemes, to invest in infrastructure.

Championing infrastructure programmes

Agreed national infrastructure priorities could be championed more aggressively, perhaps using the 2012 London Olympics as a model for successful delivery. That was a large, complex, and diverse project, that involved numerous layers of planning and the engagement of all levels of government, and which at its completion generated numerous saleable assets.

In the case of the Northern Powerhouse, a similar delivery authority could be created. Due to the nature of the initiative, and the devolution of power to local level, city and local authorities would have to be formally recognised in the development and implementation of any plans.

Clear long-term plans with political buy-in are an absolute necessity

A delivery authority is of little benefit if there is no clarity about what precisely it is supposed to be delivering. This underlines the importance of a coherent infrastructure plan which is both technically sound and based on a rational assessment of present and future needs. We feel that the National Infrastructure Plan fell short of providing this, but the NIC's National Infrastructure Strategy could address these shortcomings, although we note that five years is still only one political cycle.

Features which we think are essential in governance structures at regional or national level are as follows:

- co-ordinated across different departments and levels of government (including local and city governments);
- devoid of frequent policy reversal and prevarication over key decisions;
- supported by regulatory stability (especially in relatively regulation heavy sectors such as energy and utilities); and
- dovetailed with the ability of construction firms to supply the necessary resources to do the job.

The role of the National Infrastructure Commission in governance

We welcome the creation of a National Infrastructure Commission and this consultation. The NIC has an opportunity to bring the long-term thinking and clarity that appears to have been lacking in UK infrastructure policy its National Infrastructure Strategies. The creation of a predictable project pipeline with delivery timelines would significantly enhance the infrastructure investment environment in the UK – including, crucially, in the North and bring strategic, long-term benefit to the UK economy.

London's transport infrastructure

What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2? What innovative funding mechanisms could be considered to support delivery of key schemes?

Is funding for London infrastructure projects a special case in the UK?

As an institutional investor, our views about the funding of large projects in London are similar to those relating to the funding of infrastructure in the North. However, the scale of the London economy and its global profile - along with greater devolved powers - does give London more scope to direct its own infrastructure priorities and potentially to fund them than other regions.

Initiatives such as the London 2050 strategy include practical steps to help make infrastructure planning and delivery easier through tools such as the Infrastructure Mapping Application. This shows the role that local and regional government can have as an enabler of investment as well as a policy maker and funder.

We believe that the NIC should have oversight of, and offer strategic guidance on, all major infrastructure projects including those in London – particularly since certain London infrastructure projects are of strategic national importance. Crucially, this will require partnership between the GLA, London Boroughs and the NIC. It is important that local government has a strong say in infrastructure projects, but equally projects must fit within a coherent national framework to avoid duplication and to ensure road, air, rail and sea transport are integrated in a way that serves the national economy.

We don't offer views on the how costs to taxpayers should be distributed as this is a political question – though there is logic to the view that those that benefit the most from improvements to infrastructure should bear a greater proportion of the costs of its provision. For this reason further consideration should be given to what fiscal and policymaking powers can be devolved to London authorities.



**National Infrastructure Commission
Call for Evidence:
London Evidence**

**A Response by the Pensions
Infrastructure Platform (PiP)**

January 2016

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Executive Summary

The issue of pension funds' investment in infrastructure cannot be looked at in isolation from the wider economy and, specifically, the role of defined benefit (DB) pension provision. Despite the gradual decline of DB pension provision in recent years, over a third of the UK's workforce is still accruing benefits in a DB scheme, with schemes themselves managing over £900bn of assets. It is therefore crucial that employers sponsoring DB schemes can meet their obligations to scheme members without facing undue impact on their ability to invest elsewhere in the economy.

In order to match their long term pension payment obligations, provide security for scheme members and reduce the risk of volatile cash contributions from scheme sponsors, pension schemes need investments that generate long term, consistent, low-risk, inflation-linked cash flow returns. Core infrastructure, including transportation system assets, can be a great source of these long term, low risk cash flows. Unlocking institutional investment into infrastructure on a large scale would also be highly beneficial to the economy.

However, achieving increased investment into infrastructure depends a great deal on the predictability of the returns that will be generated over the longer term. For transport assets, this predictability principally relates to the political and regulatory regimes the assets will be operating under, the level of any subsidies that may be paid and the usage revenues that will be obtainable.

Predictability in these areas is needed from start to finish – from the initial stages of project consideration – to make it worthwhile for pension schemes to incur the bidding and project development costs and to arrange long term funding – right through to operation.

Any reduction in long term predictability, whether real or perceived, increases the overall project risk for an investor, pushes up the level of returns required to reward the taking of that risk and therefore makes projects more expensive.

We believe that the definition of clear long term goals which form the basis for a coherent long term plan is the best way to provide confidence to pension scheme investors, developers and operators. Such a plan should also include transparent and predictable mechanisms for evolution to reflect changes in the external environment and to facilitate responses to unanticipated market or technological developments.

Overview of PiP Response

Introduction

1. The Pensions Infrastructure Platform ("PiP") is the UK infrastructure investment business set up "by pension funds for pension funds". Its objective is to facilitate investment into UK infrastructure projects by UK pension schemes, by developing investment vehicles which meet their needs in terms of structure, returns and cost.
2. PiP was established in 2012 following the signing of a Memorandum of Understanding by the National Association of Pension Funds ("NAPF"), the Pension Protection Fund ("PPF") and HM Treasury. The development was supported by 10 of the UK's largest defined benefit pension schemes.
3. PiP's first investment fund was launched in 2014. It is managed by Dalmore Capital and invests in PPP equity. The second fund invests in small scale (sub 5MW) rooftop solar PV installations. This was launched in February 2015 and is managed by Aviva Investors.
4. PiP has also worked with Dalmore on the successful consortium bid to construct and operate the new Thames Tideway Tunnel (TTT). PiP was instrumental in £370m of equity contribution to the project by UK pension schemes.
5. Since its establishment, PiP has helped secure over £1bn of committed investment into UK infrastructure projects.
6. PiP has recently received FCA authorisation. Future pension scheme investments into infrastructure will be delivered through a regulated investment fund, operated and managed by PiP.
7. PiP will not be commenting on the technical questions posed in the call for evidence. We are not urban planners, we are not transportation specialists nor are we electricity market academics. What we are is a specialist equity and debt financier, working on behalf of UK pension schemes to facilitate, source and manage effective investment by them into UK infrastructure projects. We do this because we believe the stable long term, inflation linked cash flows that can be generated by core UK infrastructure projects is a good match for the long term pension payment liabilities within such schemes. This makes decision making easy for PiP because there is one fundamental criteria above all else that determines whether pension schemes will invest into infrastructure; will the entry price, the risk taken on and the returns to be generated over the full project life improve the ability of pension schemes to pay their members pensions in full when they become due?

If this criteria is not met, there will be no investment since it would breach the basic fiduciary duty of the Trustees who are responsible for the financial security of the schemes they manage. No amount of political expediency, publicity or perceived "national interest" will overcome this basic requirement to safeguard the retirement provision for UK pension scheme members.

Background

8. When pension schemes assess investment into long term, illiquid assets, such as transport infrastructure, which typically will be bought and held for at least 20-30 years, a key consideration is the stability of the operating regime and therefore the robustness of the long term financial forecasts which need to be made. Political, regulatory, legal and subsidy environments are core parts of this stability assessment.
9. The perceived stability and predictability of the UK are real competitive advantages. Indeed, the reason why the UK has been so successful to date at attracting pension scheme investors into infrastructure projects is because it is viewed as having a very stable political, legal and regulatory environment. It is impossible to look forward to the potential for any future infrastructure investment projects without stating the essential precondition that the Government should NOT enact any retrospective legislation that would subsequently change legal contracts that have been freely entered into. Any such legislation would undermine the stability argument and severely damage long term investor confidence.
10. Where a system of subsidy payments forms a significant part of the operational economics of a project, it is equally important that these are predictable for the long term. This applies through the full project life from the earliest stages of investment appraisal, while funding sources are being secured and after project contracts have been signed.
11. Pension schemes have a fundamental obligation to pay accrued pension benefits to members, usually on a monthly basis. It is therefore vitally important that pension schemes have a reliable stream of income from their investment portfolios to enable them to fund their pension payments. This need for income imposes a finite limit to the proportion of every scheme's investment portfolio that can be invested into non-yielding assets, such as infrastructure projects which do not return any cash to investors during a construction period. In general, the longer the period of no income, the less attractive an asset is for pension schemes to invest in.

The recent Thames Tideway Tunnel project provides a good example of how multi-year construction projects can be structured to make them attractive to pension scheme investors. Equity investors begin receiving returns on their investment as soon as cash is drawn down to fund construction. The project delivers a yield from day one. To balance risk between investors and users, there are also contractual risk sharing mechanisms to maintain the incentive on the construction team to deliver an operational asset on time and on budget.

12. We now turn to the specific questions posed by the consultation, focusing on those where we disagree with the current proposals.

Response to specific key questions

Question 4: What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

Funding:

It is important at the outset of any project for there to be clarity over how the new asset is to be funded, both through its construction and its full period of operation.

- Will construction and operation be funded in one single package, as is standard in PPP/PFI projects, or is there separate construction funding followed by distinct operational funding?
- Will the users pay directly, for example through a tolling mechanism, or indirectly via taxes which support government or local authority project funding?
- Will there be any form of ongoing government subsidy for operation of the asset? If so, what mechanism or legal structure will govern the subsidy regime over the full life of the asset?
- Through what mechanisms will returns be generated for investors in the project? How secure and predictable are these return streams?

Financial markets and investors have consistently proven their ability to develop new and innovative forms of funding. This will continue and can be promoted by early definition of key project parameters.

Financing:

UK pension schemes are keen to invest into UK infrastructure projects that can provide long term, low risk, inflation linked cash flow returns. These investments can be into project debt or equity depending on precise risk profiles and return streams.

The 2015 Annual Survey of UK pension schemes by the Pensions and Lifetime Savings Association reveals that, on average, UK defined benefit schemes are only allocating 2.1% of assets to infrastructure. This would rise to 5% or even 10% if UK schemes matched their peers in Canada and Australia. There is a potential investment pool of over £25bn from UK pension schemes for projects structured to meet their needs.

The keys to accessing this pool of potential financing are:

- A clear pipeline of future projects to provide the confidence for pension schemes to develop the internal capabilities and mechanisms to invest in infrastructure.
- Projects structured to reduce overall risk consistent with producing real returns in the 2-5% range.
- Projects structured to minimise any initial periods of zero yield.
- Inflation linked return streams for both debt and equity financing.
- Clarity over the long term regulatory and subsidy regimes within which the asset will have to operate.

Delivery:

Although this call for evidence specifically excludes any consideration of the third runway in the Southeast of England, there are lessons that can be learnt from it for future London transport infrastructure projects:

It is imperative that all potential project participants, can be confident that the critical political decisions will be taken to enable projects to progress. Where timetables are provided they MUST be stuck to.

Major transport projects in London will inevitably affect many individuals and businesses. Some will benefit, some will be disadvantaged. In the age of social media there will also inevitably be pressure groups opposing projects and supporting them.

It will always be easy to delay a decision to allow for more research or consultation. Major projects need courageous decision making to make them happen. If the Government is serious about wanting to attract UK pension fund investment into UK infrastructure (as the Chancellor said in his autumn statement in 2012 and more recently in relation to investment by local authority pension funds) it must be prepared to take bold decisions with a focus on the long term, not short term political expediency.

The funding, financing and construction skills are all available in the UK to deliver major projects. The critical constraint on delivery is political decision making – or the lack of it!

Further Information

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Port of London Authority Response

National Infrastructure Commission – call for evidence

3.1 London's transport infrastructure

The Commission is seeking evidence related to London's transport infrastructure, with particular emphasis on large-scale transport infrastructure improvements. Our response relates to the future potential of the Thames, the role it plays as both: transport infrastructure itself; and as a key transport route for construction of major new infrastructure, removing pressure on London's existing transport network.

Thames potential

Over the last nine months we have been developing, with stakeholders, a Vision for the development of the Thames over the next 20 years. The project has identified potential for increasing all types of river use, linking it to the growth of the city, particularly to the east. We are currently consulting on the emerging conclusions of this work around six goals, of which the following three relate to transport infrastructure:

- The busiest ever Port of London, handling 60 – 80 million tonnes of cargo each year (in 2014 the port handled 44.5 million tonnes)
- Double the number of people travelling by river – reaching 20 million commuter and tourist trips every year
- More goods and materials moved between wharves on the river, taking 550,000 lorry trips off the region's roads

A summary of the Thames Vision Goals and Priority Actions can be found on line, using this link: <http://pla.co.uk/assets/thamesvisionsummary.pdf>

The full Thames Vision Goals and Priority Actions consultation document can be found using this link: <http://pla.co.uk/assets/thamesvisionmain.pdf>

More information on the Thames Vision project is at: www.pla.co.uk/ThamesVision

We have included overleaf further information on: the Thames' existing contribution as a transport route; how the Thames is used to deliver major infrastructure schemes in the capital; the economic contribution that flows from employment of people working on and around the river; and river crossings.

Thames as a passenger travel route

- In 2014, there were ten million passenger trips on the Thames. The Thames Vision project has identified scope to double this.
- In the last couple of years, the river passenger transport network has grown west to Putney; in the coming years it is expected to grow to the east – with a series of new pier opportunities already identified.

Actions required for greater passenger travel:

- *Continued engagement between the PLA, the Mayor's team, the GLA, Transport for London and the Assembly around the ambitious targets to increase passenger travel.*
- *Making more efficient use of piers and riverspace, including new timetabling to manage peaks in traffic.*
- *Encouraging more use of piers at current low peak times.*
- *Long-term pier strategy, going beyond the existing River Action Plan: new piers at Thamesmead, Erith, Greenhithe, Swanscombe, Grays and Tilbury by 2025.*

The Thames and major infrastructure schemes

- The record 5.5 million of freight moved between wharves on the Thames in 2014, kept more than 250,000 loaded lorries off London's congested roads.
- Major schemes using the river as part of their logistics chains include:
 - Crossrail moved three million tonnes of excavated material away from London on the Thames, with 1,528 shipments taking 150,000 lorries off the roads.
 - Crossrail also used the Thames to move 110,000 tunnel segments for the eastern twin tunnels, from the factory where they were made in the Medway to the main tunnel drive site in Bow Creek, close to Trinity Buoy Wharf, saving an estimated 10,000 lorry movements.
 - Blackfriars Bridge station project over three years, starting in 2011, 80,000 tonnes of construction materials and site waste was moved on the Thames, including cranes, scaffolding, pre-cast concrete sections and 25-tonne steel rib sections that made up the skeleton of the bridge.
 - The Thames Tideway Tunnel project team has a legal commitment to move over 5.5 million tonnes of tunneling materials by river during their seven-year project, and is adopting a 'river first' policy, where materials can only be transported by road if it can be demonstrated it impossible to do it by river. This project will link to the Lea Tunnel scheme, which itself used the River Thames to move 1.7 million tonnes of excavated material from Beckton and Abbey Mills.
 - Northern Line extension: 600,000 tonnes of excavated waste material is being transport from Battersea by barge to Tilbury in Essex, removing over 40,000 lorry journeys by road and prevent 2,000 tonnes of carbon emissions.

Actions required for greater freight movement by river:

- *Work with Transport for London and the Greater London Authority to extend the River Concordat to promote freight movements by water*
- *Mandating the use of the Thames for major projects' transport needs, where projects are close to the river.*
- *Continued safeguarding and reactivation of wharves for port operations in London in accordance with national (NPPF) and regional (London Plan) planning policies; at least Peruvian, Orchard and Hurlingham wharves brought into operation over the next decade*
- *Establish a Thames Skills Academy by Autumn 2016, to provide a sustainable model for skills development on the Thames*

Thames' economic contribution

- Latest research into the economic impact of port and river operations shows that, in Greater London the Thames generates:
 - 10,000 full time equivalent jobs
 - £1 billion of economic value added annually
- The first ever study of the amenity value of the Thames found that:
 - At least 23 million people visit attractions by the Thames every year
 - Almost 100,000 people are employed in the tourism industry in wards adjacent to the Thames
 - These activities generate £2.4 billion gross value added a year

Links to the study findings are here: <https://www.pla.co.uk/About-Us/The-Thames-Vision/Evidence-Base>

River crossings

- We are supportive of the river crossings agenda, alongside retaining river access for ships into the Pool of London - as has been possible since Roman times. We will continue to work with Transport for London on this.

Action required around river crossings:

- *At least three further Thames crossings to the east of Tower Bridge, that allow continuation of river trade; the first by 2022*

About the PLA

The Port of London Authority (PLA) is a self-financing organisation, set-up by an Act of Parliament in 1909 to run the tidal River Thames in trust for future generations. The tidal Thames runs for 95 miles from Teddington Lock, through the capital, and out to the sea. Our 350-strong workforce oversees safe navigation, protects the marine environment and promotes the use of the river. We have no shareholders; any financial surpluses are reinvested in stewardship of the river and improving the efficiency of our operations. More information on the PLA: www.pla.co.uk

[contact redacted]

National Infrastructure Commission: Call for evidence

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QASER Lab
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London's transport infrastructure

3.1 What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

Different studies address the major long-term challenges which are strongly associated with steep increases in the London population, and thus the necessity to develop and adapt the transport system, particularly public transport. As a consequence, the priority will be to tackle environmental issues such as the reduction of air and noise pollution.

3.3 What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

It is possible to hone the capabilities of the Land Value Finance (LVF) tool. LVF is a financial policy tool already used in Crossrail 1 through which it is possible to finance transport infrastructure in an efficient, transparent, and equitable way. Due to the persistent effects of the 2008 economic crisis on public sector budgets, large-scale infrastructure investments such as London's Crossrail or the Northern Line Extension have typically suffered from substantial funding shortfalls; thus, there was the need to find innovative tools to finance London transport investment. Land Value Finance (Business Rate Supplements, Tax Increment Finance and Betterment Tax) was used to raise complementary financial resources to reduce this shortfall.

In the case of Crossrail 2, two specific strategies can be considered in order to improve the use of LVF, reduce costs and increase benefits. Strategy one considers a modification to the fiscal scheme of the Business Rate Supplement (BRS) by linking it more directly to the land value benefits generated by Crossrail 2. The second strategy is to use a discounted cash flow analysis to examine the gains which could be

achieved through the issue of a municipal bond backed by BRS additional revenues. We have tested the two strategies for the Crossrail 1 scheme by collecting BRS data and real estate values of London boroughs for 2009, 2010 and 2011. The results in the case of Crossrail 1, which can be extended in the case of Crossrail 2, indicate that the two strategies are indeed able to raise additional funds and reduce the costs of the transport scheme.

3.4 What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

Due to the importance of London infrastructure assets in the global context, we need to take into account the existence of heterogeneity among different infrastructure sectors and sub-sectors. As Oyedele observes, “infrastructure is an incorporation of many heterogeneous sectors including roads, bridges, ports, power generation, electricity, gas, utilities, and telecommunications with no two having identical attributes.” As verified in our analyses, UK infrastructure sectors and sub-sectors such as transport perform differently and show variations in annual returns and volatilities.

From this perspective, at present private capital exceed desired and possible investments in London. Investors are forgoing risk and seeking stable, secure options, preferably with non-zero returns, but they are seemingly sometimes happy with zero or negative returns (pension funds and other savers are essentially paying fees to park money). Despite efforts to develop innovative financial mechanisms and structures that satisfy all the needs of investors, still more can be done, particularly in the form of government initiatives to support transport infrastructure investments. When we consider private sector transport infrastructure investment, we notice how it has taken the brunt of the criticism meted out. Apart from the short duration of investment funds, another drawback is the amount of leverage of these funds and the high fees charged by fund managers, which when taken together reveal a misalignment of interests. The high fees and carried interest are beneficial for fund managers, as they lead to a buy-hold-flip structure, but they do not correspond, for example, to pension fund needs. Government restructuring of these instruments would certainly represent an important step towards encouraging pension fund investment in infrastructure such as transport.

One innovative possibility is for investors to invest directly in large physical assets such as infrastructures like Crossrail 2. However, when we consider this investment option, since a high level of capital is needed, the investor is exposed to various risks, of which policy and demand risks are among the most significant. These risks are significant since the stability of cash flows is only guaranteed if there is no change in both the transport provision of services and in the legal and regulatory conditions pertaining to a project. Within this context, three financial options: (1) London Transport Infrastructure Fund, (2) Urban Investment Portfolio, and (3) UK Sovereign

Wealth Fund, could be important as effective vehicles for transport investment in London. These three financial mechanisms allow for diverse investment across a range of sectors, and by so doing, they minimise exposure to risks that may be associated with policy making, to take one example.

Given the wide range of private and institutional investors present in the market, it is surprising that few analyses have thoroughly studied the different analytical strategies of investors. In consideration of our analyses dedicated to UK infrastructure, we can reach some interesting conclusions on the matter at hand.

The creation of a UK Sovereign Wealth Fund will aim to boost investments in large-scale infrastructure projects. The idea of creating the first UK Sovereign Wealth Fund to invest in homes, roads, and railway systems such as Crossrail 2 has recently gained a new and substantial wave of support among important figures in the UK fund management industry. This idea proposes the merging of a number of public sector pension schemes, in partnership with authorities, to create a large fund to invest in infrastructure, while simultaneously generating savings and creating attractive returns for pensioners. The potential of having a UK Sovereign Wealth Fund for infrastructure investments in London, particularly transport, is significant. This fund could not only address current infrastructure needs but also benefit future generations. Nevertheless, this idea is not without great challenges. Persuading pension funds to merge will not be easy. Some pension schemes have developed solid business models during the past 25 years, and will most likely be resistant to change. Despite the challenges, however, the idea still remains highly attractive.

In relation to the Urban Investment Portfolio, we can observe that investing in transport infrastructure within a portfolio is beneficial as long as it is part of investment in other assets, such as real estate. Our research findings have concluded that urban investments need to be treated as an integrated and interdependent entity, and that an Urban Investment Portfolio approach, by allowing for both risky and less risky urban investments, will achieve private sector high financial returns while also addressing the wider environmental/social and urban/transport needs. Private sector participation is likely to increase if the investment portfolio ranges across sectors and objectives, thereby reducing exposure to risk.

Additionally, we can confirm that the creation of a Transport Infrastructure Fund that invests in a specific infrastructure sub-sector, such as London transport, can certainly satisfy diversification benefits. In our analysis, transport shows a strong performance over the period between 2004-2014, with a return of 9.35% and volatility at 23.81%. It is the best-performing infrastructure asset, with a Sharpe Index of 0.334. This is not surprising, as transport is a very stable sector. Moreover, by focussing on transport, a fund manager can gain complete knowledge of the performance of the sector and still enjoy diversification benefits.

The introduction of these three mechanisms would allow sustainability in decisions to fit better into existing financial decision-making models and be compatible to cost-benefit approaches. The three mechanisms are also likely to foster private investor involvement because private investors help to curtail the risk of making poor investment decisions and investing too heavily, or too little, in London transport infrastructure.

3.5 How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

London has been and continues to be a role model of radical and innovative financial mechanisms for transport investments. For instance, the London Green Fund is an interesting structure after which the proposed London Transport Infrastructure Fund can be structured. To our knowledge, examples of Urban Investment Portfolio are not yet available, with the exception of our study for the European Investment Bank (EIB). The cities that have developed smart city strategies have made manifest the concept of integration of their urban investments; metropolitan role models include Barcelona, Freiburg, Malmö, and Chicago in the USA. All of these cases provide useful lessons but, as each city is different, the financial instruments would need to be defined and tailored for London.



RAC Response to the National Infrastructure Commission Consultation

ABOUT THE RAC

With more than eight million members, the RAC is the oldest and one of the UK's most progressive motoring organisations, providing services for both private and business motorists. As such, it is committed to making driving easier, safer, more affordable and more enjoyable for all road users.

The RAC, which employs more than 1,500 patrols, provides roadside assistance across the entire UK road network and as a result has significant insight into how the country's road networks are managed and maintained.

The RAC is separate from the RAC Foundation which is a transport policy and research organisation which explores the economic, mobility, safety and environmental issues relating to roads and their users.

The RAC website can be found at www.rac.co.uk

RESPONSE SUMMARY

The RAC welcomes the role of the NIC as a new, independent body which will look broadly at long-term infrastructure needs and provide impartial advice to ministers and Parliament.

The RAC's response to this consultation is based upon its experience and knowledge on road policy and will focus its response on sections 1 and 2.

RESPONSE

The RAC welcomes the National Infrastructure Commission's role in providing impartial advice on long term issues such as inter-connectivity and improving the transport infrastructure network.

Section 1 – Connecting Northern Cities

- 1. To what extent are weaknesses in transport connectivity holding back northern city regions (specifically in terms of jobs, enterprise creation and growth, and housing)?**

The RAC believes the poor state of local roads (both in the north of England and across the whole of the UK) can heavily impact upon all of the areas mentioned in the question. The vast majority of journeys begin and end on local roads, whether or not the on-going journey is by road, rail or by air. The state of local roads is now the biggest concern for motorists, according to the 2015 RAC Report on Motoring. Our figures show that for 10% of drivers the state of local roads is now their number one concern, while a further 20% listing it as a top four issue. Half of motorists (50%) say the condition of roads in their area has deteriorated over the course of the past year. Transport spending priorities reflect these concerns: 30% say local road maintenance is their top priority for government transport investment (higher than any other spending priority), and indeed 45% of motorists say they would pay higher motoring taxes if the revenue raised was ring-fenced for road maintenance.

The Government's own estimates suggest that in order to get local roads in England back to an acceptable standard, it would require a 1-off investment of £8.6bn. Independent forecasts for the Asphalt Industry Alliance suggests the sum required is closer to £12bn. The cost to businesses through damage to suspension and steering of fleet vehicles has been estimated to be around

£215m¹. Such estimations are likely to have a wider impact on business and enterprise growth. The RAC estimated that in 2013, the cost to motorists was £100m².

For this reason, the RAC believes that the National Infrastructure Commission should look carefully at the role that fit-for-purpose local roads can play within the wider infrastructure debate. Improving the strategic road network and connecting cities with new roads, whilst vital, will count for little if motorists and businesses continue to suffer costly repairs and disruption when using the local road network. Whilst we understand that local roads are primarily the responsibility of local authorities, we call upon the Commission to look further into how better quality local roads can support wider infrastructure projects.

2. **What cost-effective infrastructure investments in city-to-city connectivity could address these weaknesses? We are interested in all modes of transport.**

For the reasons highlighted above, the RAC believes it is vitally important that upgrading local roads forms part of the debate of addressing city-to-city connectivity. We strongly urge the Commission to look into this in both northern cities, and the wider United Kingdom.

3. **Which city-to-city corridor(s) should be the priority for early phases of investment?**

The RAC has no specific comment to make on this question.

4. **What are the key international connectivity needs likely to be in the next 20-30 years in the north of England (with a focus on ports and airports)? What is the most effective way to meet these needs, and what constraints on delivery are anticipated?**

The RAC has no specific comment to make on this question.

5. **What form of governance would most effectively deliver transformative infrastructure in the north, how should this be funded and by whom, including appropriate local contributions?**

In relation to local roads, it is right that local authorities continue to have the primary responsibility for local road maintenance. However, local authorities have far more prescriptive legal obligations in the provision of other services such as education and social services. As a consequence, local road maintenance commands a relatively low priority even though motorists rank local roads as second only to education when it comes to prioritising local authority budgets. The 2015 RAC Report on Motoring demonstrates this, ranking education investment first at 46%, with local road investment second at 18%. There is a role, therefore for central Government to establish a ring-fenced source of funding for development and maintenance of local roads in a similar way to which they will hypothecate Vehicle Excise Duty to establish a Road Fund for the development and maintenance of the Strategic Road Network.

¹ <http://www.fleetnews.co.uk/news/2013/3/4/potholes-costing-fleets-millions/46357/>

² <http://www.bbc.co.uk/news/uk-england-25736223>

We should welcome any actions by the Commission to look at how better quality local roads can play a role within the wider infrastructure framework.

Section 2 – London’s transport Infrastructure

- 1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?**

For motorists in London, local road maintenance is important. According to the 2015 RAC Report on Motoring, 30% of London motorists in the capital say their roads have deteriorated since 2014. Whilst this is only half the rate (59%) reported among drivers who live in villages or rural areas, it is never the less a significant percentage. It is unclear whether this is indicative that the condition of local roads in London is better than in more rural areas, or whether it is a reflection that Londoners generally have better access to other forms of public transport and so are less dependent on local roads.

- 2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?**

The RAC continues to believe that the road infrastructure will continue to play a major role in personal and public transport and in the delivery of goods and services. It is therefore essential that London’s local roads infrastructure is maintained to high standards and evolves to support ultra-low carbon road transport.

The Commission may wish to consider whether future revenue streams, such as that from the London Ultra Low Emission Zone, should be ring-fenced to further develop the infrastructure for ultra-low carbon vehicles, such as charging points for electric and plug-in hybrid vehicles and in the longer term, a hydrogen distribute network to support the refuelling of Hydrogen Fuel-cell vehicles.

- 3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?**

The RAC is not in a position to answer this question.

- 4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?**

The RAC is not in a position to answer this question.

- 5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?**

The RAC is not in a position to comment on major metropolitan areas in other countries.



[contact redacted]

Rail Delivery Group

Response to:

National Infrastructure Commission call for evidence: London's transport infrastructure

Date: 8th January 2016

Rail Delivery Group Response to National Infrastructure Commission call for evidence: London's transport infrastructure

[contact redacted]

Business representative organisation/trade body

Introduction: The Rail Delivery Group (RDG) was established in May 2011 to lead the industry in delivering a higher performing, more cost effective and sustainable rail network for Britain's rail users and taxpayers. The RDG brings together the chief executives of passenger and freight operator owning groups with Network Rail. RDG develops policies, strategies and plans for the coherent management of the rail industry and advances the provision of a safe, efficient, high quality rail service for users and taxpayers.

The RDG mission is to promote greater co-operation between train operators (passenger and freight) and Network Rail through leadership in the industry and by working together with Government, the supply chain and stakeholders. It is committed equally to the long-term health of the railway as well as the need to see improvement in the shorter term. It does this by developing strategies for the industry to put into practice and by proposing solutions for policy makers to implement.

For enquiries regarding this consultation response, please contact:

[contact redacted]

Rail Delivery Group
2nd Floor, 200 Aldersgate Street
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What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

London's economy is continuing to grow, encouraging further population growth and demand for rail services within and beyond the capital.

The Long Term Planning Process (LTPP) has been developed to provide robust, consistent growth forecasts; and to allow the rail industry to respond flexibly to the challenge of growing demand and plan the long-term capability of the rail network. The LTPP consists of a number of studies:

- Market Studies forecast demand over a 10 and 30 year period for freight and for three passenger 'markets' – long distance, regional urban and London and southeast.
- Route Studies then develop options for all future train services, local as well as long distance, based on the demand forecasts and priorities set by the market studies.
- Network wide issues, including the requirements of freight and the potential for technological innovations, are addressed through a series of network studies (also known as Network RUS).

The London and South East Market Study included a comprehensive review of the key drivers for future rail growth, based around four scenarios determined by the trade-offs between the economy and social/environmental planning. In every scenario growth in employment in central London continues, reflecting London's unique status as a global employment market. The density of employment in central London is high, driving agglomeration and enhancing productivity.

The high density of employment in central London and the lack of capacity of the road network has created a strong market for rail travel, which is expected to grow further in line with increases in central London employment. The current mode share of rail, Underground and DLR for peak travel into London is 80%, and in recent years the number of people entering Central London by car in the peak has fallen – from 143,000 in 1996 to 64,000 in 2012. This is attributed to measures to improve bus and cycle flow (and safety) that have in effect reduced road capacity for cars, as well as to some extent the effect of the congestion charge. The need to cater for a growing commuter market amplifies the existing challenge of providing sufficient capacity for peak travel, which may remain underutilised at other times (although a growing economy should deliver increasing levels of disposable income which would encourage further off-peak travel).

The presence of employment attracts people to live in London, and the mayor's London Plan forecasts continuing high rates of population growth. However, given existing low levels of housing affordability and limited availability of land the likelihood is that many employees will be forced to live either in outer areas of the city or in the towns beyond the green belt. In both cases rail is well placed to meet this demand, as distances become too long to be undertaken feasibly by other modes and, assuming roads policy remains broadly consistent, it is unlikely that sufficient road capacity will be available for journeys to be made by car. Network Rail is particularly conscious that, in addition to strategies which support investment in rail within London, it is critical that investment supports settlements beyond the city itself, given the significant proportion of the London employment market comprised of employees who live outside the city.

It is also anticipated that the number of Londoners in older age groups will increase, strengthening the need for investment to improve the accessibility of the transport system. Although potentially of less relevance for the rail market, a number of other demographic challenges are identified in the London Plan. These include an increasing proportion of ethnic minorities and children, and the need to address continuing levels of social deprivation.

Whilst accommodating demand for peak travel (particularly into Central London and Docklands) clearly poses the greatest capacity and connectivity issue for transport infrastructure, it is also vital that connections to international gateways (particularly airports but also HS1 stations) are maintained and improved. Providing sufficient connectivity to HS2 will also be a key future requirement.

What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

It is critical to the London and southeast economy, and the wider UK economy, to continue to enhance rail services in and around the London area. The demand from passengers continues to grow, and both the infrastructure (including stations) and many specific train services are operating

beyond capacity. If further investment in both the digitisation of railway network and more conventional infrastructure and rolling stock enhancements are not progressed over the next 5 to 10 years then it is predicted that passengers will see significant overcrowding and a consistent deterioration in the reliability of performance of these railways.

Options for enhancing the network in London and the southeast are identified in the Route Studies, which form part of the LTPP. Network Rail has just completed and published, on behalf of the industry and in collaboration with DfT and TfL, four Route Studies that cover in detail investment priorities on four of the major routes into London. To complete the set of studies covering all routes into London a further five Route Studies are also underway or are yet to commence. The challenge each of the Route Studies faces is to balance the need for high-frequency commuter services with long-distance passenger and freight services connecting a diverse range of destinations.

The text below references the key conventional infrastructure-based solutions currently proposed for resolving the capacity, and in some cases service reliability, gaps. The prioritisation is down to a combination of the currently understood demand and resulting business case, but also importantly Network Rail's assessment of works that are likely to be implementable in CP6 (2019 -2024), given the current planning and consents framework. In each case where large infrastructure investment is referenced development work is already underway at Network Rail.

It is important to note that infrastructure enhancements do not offer the sole means of enhancing the capability of the network to keep pace with demand. Although peak trains tend to run with the maximum number of vehicles permitted by platform lengths on the respective routes there remains some scope for off-peak trains to be lengthened where required to accommodate passenger demand. Reconfiguration of interiors by franchisees might also enable higher numbers of passengers to be carried on individual trains.

Demand could also be more effectively managed through a combination of changes to the fares structure and improved information provision. Where they have freedom to set fares, operators have attracted increasing numbers of passengers with discounted tickets, demonstrating the potential for some demand to be attracted to times of the day where there is more spare capacity. A key factor in supporting the take-up of these cheaper fares is clear and accessible information, combined with simpler technology-enabled means of ticket purchase. Improved information on train loadings and availability of seats could further encourage a more efficient use of capacity. However, a more extensive shift of travel from peak periods would require changes to established working patterns including more widespread adoption of remote working.

Brighton Main Line and South Central suburban

The Brighton Main Line (BML) links the top three most densely trafficked parts of the UK railway network (the approaches to London Bridge, the area between East Croydon and Selhurst/Norwood Junction, and the railway through Clapham Junction), and the particularly complex way that the route is configured, with numerous branches and two major London terminals, makes this the toughest railway in the country to operate reliably. There is minimal grade separation, so the timetable requires an almost uniquely high level of flat junction crossing moves, with a routine need for trains having to be planned across busy tracks running in the opposite direction. There is also a very high level of platform utilisation at several locations and many areas where fast and stopping trains must share the same pair of tracks.

Whilst leisure based journeys and inter regional trips have grown substantially on the route in the last decade, it remains predominantly a peak commuter route, both into central London and outer London hubs such as East Croydon. Gatwick Airport is a key destination and consequently the nature of future demand on the route will be strongly influenced by the government's response to the Airports Commission. The main operator on the BML, Govia Thameslink Railway (GTR), is to provide an additional 10,000 seats on this and connecting routes by 2018. Simplified ticketing and improved passenger information will also help to ensure that this capacity can be effectively utilised.

There is already regular existing peak standing from the Gatwick Airport area into London today, with some individual services with significant standing from as far out as Haywards Heath and Hove. The BML faces substantial demand growth – by 2023 consistent standing on most peak services is forecast to extend to at least as far south as Haywards Heath; and by 2043 to Brighton, Hove and Lewes. By this date it is likely that the number of standing passengers would routinely lead to passengers being unable to board trains at key intermediate stations such as Gatwick, East Croydon and Clapham Junction, which would then, in turn, increase dwell times potentially leading to fewer trains being able to run. It is notable that this type of constraint is already manifesting itself at some

times during the high peak, particularly at Clapham Junction and East Croydon. Accommodating these levels of forecast demand can only be achieved through running more trains than the existing infrastructure can currently accommodate.

In addition to the demand challenge, and due to the operational constraints arising from the existing route configuration, it is unlikely that long term performance levels will reach those desired by stakeholders, unless capacity bottlenecks are addressed. GTR currently accounts for around 16% of national Public Performance Measure (PPM) – the largest single TOC contributor.

The South East Route: Sussex Area Route Study set out a number of key interventions which would free up capacity at major operational bottlenecks, to meet forecast CP6 and CP7 (2024-2029) demand and improve performance. For CP6 the proposals focus on the operationally critical East Croydon to Selhurst area, with new grade separated junctions to remove the need for flat crossing moves, additional platforms and concourse space at East Croydon station and additional tracks between these two elements. This would be supplemented with some much smaller scale work at a small number of other locations on the route, delivering additional peak capacity and performance improvements. In CP6 it is assumed that four additional trains per peak hour would be facilitated, split equally between Victoria and London Bridge and also equally between the Redhill route and the BML, with some services starting from Haywards Heath. However the infrastructure design is flexible so several other combinations are possible.

For CP7 and beyond a choice would arise as to whether to run further additional trains to the London Bridge or Victoria route. Running additional trains via the London Bridge route would require Norwood Junction remodelling and potentially an extension of Automatic Train Operation and ETCS Level 2 south of the Thameslink core down the Sydenham corridor. The delivery of ECTS/ ATO and Traffic Management systems on the Route would all be delivered as a joint package for a subdivided area of our Three Bridges Regional Operations Centre (ROC). Grade separation of Keymer Junction enabling more trains to start from Eastbourne, Brighton or Hove is also anticipated at this time.

The BML upgrade would provide a major catalyst for the ongoing redevelopment of central Croydon, potentially with significant oversite development above the new station. The reconfiguration of East Croydon platforms, together with the additional of new concourse space, could enable provision of large numbers of homes and office space above, consistent with demand. The London Borough of Croydon is a major stakeholder of the scheme and is a strong supporter of Network Rail's proposals.

The ongoing redevelopment of the central Croydon area means that there is potentially a limited window of opportunity to upgrade the BML in this critical area, due to the risk of development of the land outside the railway boundary which would be required. If the opportunity is not taken in CP6 it cannot presently be assumed that the option would be available in CP7.

The Croydon area upgrade proposals would, as well as enabling more trains to run fast north of Croydon, also unlock a key bottleneck on suburban slow line routes which serve a densely populated area of London not served by the London Underground network. Further work is ongoing with Transport for London to further identify which other constraints would need to be resolved to increase suburban services in CP6 and beyond.

South West Main Line

The South West Main Line (SWML) is one of the busiest and most congested routes on the network. It serves a major commuter area as well as providing long distance services from the South and South West of England to London Waterloo.

Work being delivered in Control Period 5 will see the Main Suburban and Windsor Line services extended to 10 car operation which along with the new Class 707 Desiro City rolling stock currently under construction will support the capacity needs in the suburban area. The key challenge is for main line services which use the Fast Line. The density of operation on the single Up (London bound) Fast Line inwards of Surbiton during the peak is higher than on any other single stretch of main line in the UK. The significant growth in passenger numbers alongside the constraint on network capacity means even the smallest delay can quickly be transferred to other services.

For the main line services, it is critical to note that even before growth is considered approximately 20% capacity is required to deal with existing overcrowding. Standing is commonplace from Woking and Basingstoke on main line services today, and without further, large scale, intervention beyond CP5 the SWML could see levels of crowding resulting in passengers being unable to board services from inwards of Farnborough.

The Wessex Route Study describes a strategy to meet demand to 2043. At least 37 trains per hour will need to be operated on the Main Fast Line by CP9 (2034-2039), compared with the capacity to deliver 24 trains per hour today. The key challenge on the SWML is increasing the capacity between Surbiton and Clapham. To unlock further services on this section will require a significant infrastructure intervention (or combination of):

- Crossrail 2 (delivers 32-36 peak Main Line trains per hour)
- ETCS + ATO (30-34 peak trains per hour)
- Fifth track from Surbiton inwards (30-34 peak trains per hour)

There are a number of other interventions also needed on the route to complement any combination of the above 3 options in the inner area, these are predominantly grade separation of junctions.

The scale of intervention required across the whole route is significant and therefore would need to be delivered over multiple control periods.

Several interventions have been prioritised for CP6 to provide resilience and reliability in the short term and support achieving the capacity required once combined with further interventions. The priorities for CP6 interventions are:

- Woking Grade Separation
- Woking Platform 6
- Extension of the Up Main Relief Line between Queenstown Road and London Waterloo
- Clapham Junction passenger congestion relief

Grade separation of Woking Junction will, in the short term, improve performance through the removal of the need for Portsmouth Direct Line services having to cross the opposite flow on the SWML towards Southampton. In the longer term it will enable the reliable operation of the increased level of service proposed by the implementation of the 'inner' solutions. To achieve an increased level of service at Woking will also require additional platform capacity.

A key constraint to reliably increasing the capacity on the Main Line is the section between Clapham Junction and Waterloo. To support the future train service uplift modifications will be required to the layout to support operation of an Up Main Relief Line between Nine Elms Junction and London Waterloo to support segregation of the Windsor Line and Main Line services.

Great Eastern Main Line

The Great Eastern Main Line (GEML) carries a fast-growing long distance flow from Norwich into London, key commuter flows from Southend Victoria, Chelmsford, Clacton on Sea and Braintree, as well as a significant amount of freight generated by the port of Felixstowe. Crossrail, which completes in 2019, brings significant investment to the London end of the GEML, benefiting local suburban passengers inwards of Shenfield with new rolling stock and direct connectivity to and beyond central London.

The GEML services face substantial growth between now and 2043. With services already operating at full length and no affordable solution for further lengthening due to constraints at London Liverpool Street, accommodating the forecast demand can only be achieved through running more trains.

Without intervention, services on the route to London Liverpool Street via Chelmsford will be over seated capacity and between 40 per cent and 100 per cent of standing capacity will be taken up for well over 20 minutes. Services that start from Norwich, Stowmarket, Witham and Chelmsford tend to have the highest load factors and demand is at or exceeds seated capacity now inwards of Chelmsford.

The main line inwards of Shenfield is already highly congested in the peak hour in terms of the number of services operating on the fast lines. This means that increasing the level of service above 24 trains per hour, achievable in early CP6, comes with a likely adverse effect on reliability and performance without a series of interventions to improve the capability of the infrastructure.

The Anglia Route Study set out a number of key interventions that are required over multiple control periods to accommodate the forecast demand and improve performance. For CP6 the proposals focus on delivering additional capacity on the Norwich to Shenfield corridor where current crowding and future growth is greatest. There is also a focus on improving the journey times for services on this

corridor to London and therefore the interventions provide both capacity and journey time benefits. A passing loop to the north of Witham will support an increase in peak passenger services from Norwich and Ipswich to London. The passing loop will also support journey time improvements as in the off peak it can be used to overtake slower moving freight services travelling to/from the Port of Felixstowe. Additional platform capacity at London Liverpool Street is required to support any increase in main line trains services. Trowse single line on the approach to Norwich is a critical constraint on the route which restricts the number of additional services which can service Norwich. The single line section includes a swing bridge and would need to be replaced with a two track structure to support the increase in train services required.

For later control periods, further interventions will be required to improve the signalling headway on the route to support an increase in the number of services on the section between Chelmsford and London Liverpool Street, this will require ETCS and ATO technology, part of Network Rail's Digital Railway plans for the Route. Network Rail is currently assessing whether ETCS Level 2 could be implemented earlier on the GEML in CP6 to release capacity benefits earlier. The delivery of ETCS/ ATO and Traffic Management systems on the Route would all be delivered as a joint package for a subdivided area of the Romford Regional Operations Centre (ROC).

Great Western Main Line

The Great Western Main Line (GWML) operates from London Paddington station through the Thames Valley towards the West of England and South Wales. It serves a variety of passenger markets and carries a significant amount of freight (second only to the WCML). It suffers from on-train crowding at peak times, congestion at London Paddington station, and significant constraints to operating more train services. Heathrow Airport is a key destination at the London end of the route, and if the government approves the Airports Commission's recommendation of a third runway the volume of demand it generates will increase further.

Significant investment is taking place to enhance the capacity and capability of the route. The Great Western franchise is to introduce new trains and will provide 4,000 extra morning peak seats into Paddington every day by December 2018.

On the Relief Lines, Crossrail will complete in 2019 and will provide a significantly enhanced service for passengers at stations between Reading, Heathrow Airport and London. Opportunities exist to further increase capacity through running more trains west of London Paddington, and through potentially lengthening the trains from 9 to 11 cars in the future.

On the Main Lines, the rolling stock currently used for passenger trains will be replaced with new Intercity Express trains with greater overall capacity than today. Peak frequency will also be slightly enhanced to provide 20 trains per hour arriving at London Paddington in the peak period. However, the capacity provided will only be sufficient to accommodate the demand forecast during CP5. Additional capacity will be required to accommodate forecast demand for CP6 and beyond whilst meeting crowding standards etc.

The Main Line train service required for capacity is as follows (assuming the same capacity per train as at the end of CP5):

- End CP5 20 trains per hour
- CP6 22 trains per hour
- CP7 24 trains per hour
- 2043 29 trains per hour

To run a frequency of train service above 20 trains per hour will require infrastructure changes due to the constraints of the signalling system, and the physical constraints of trains needing to cross the paths of other trains approaching or leaving London Paddington station (throat).

The Western Route Study assessed what would be required to run 24 trains per hour and developed an option to provide a grade-separated junction in the area of Ladbrooke Grove in west London. A number of configurations are possible but in essence a flyover or dive-under would take one track or pair of tracks over or under another to remove the physical constraint of trains crossing on the same level. Grade separation of Ladbrooke Grove Junction would increase the capability of the whole system, reducing the level of conflicting train movements creating greater timetable capability, increasing flexibility in the platforming and operation of services using London Paddington and associated depots. Signalling improvements would also be required to allow trains to follow each other more closely.

Linked to this is the opportunity to rationalise the layout of the throat at London Paddington station. The track in this area was installed in the early 1990s and is due for renewal during CP6. If a grade separated junction is provided at Ladbrooke Grove then it is possible to reconfigure the track layout to reduce complexity (and potential for asset failure), increase safe access for maintenance while trains are running, and change which trains use which platforms at London Paddington station, which will potentially ease crowding at pinch points within the listed train shed.

The interventions would allow 24 trains per hour to operate, and potentially more subject to further signalling technology improvements in later years.

The opportunity exists to align the enhancement of Ladbrooke Grove Junction and Paddington approaches with the renewal and the opening of the new HS2 station at Old Oak Common. Such an approach could minimise passenger impact while achieving efficient delivery of a system enhancement through alignment with the renewals.

Midland Main Line

The East Midlands Route Study examined forecast service levels on the Midland Main Line (MML) out of London St Pancras International together with local routes that radiate out of Derby, Leicester and Nottingham. The MML carries Thameslink services from the capital as far as Bedford along with Long Distance High Speed (LDHS) services to Corby, Leicester, Nottingham, Derby and Sheffield.

Enhancements planned over CP5 and CP6 will allow a new, 6 train per hour electric LDHS service to operate on the Midland Main Line. Electrification to Kettering and Corby is planned to be delivered during CP5, with the remainder of the MML to Nottingham and Sheffield via Derby being delivered during CP6. It is envisaged that new electric rolling stock to operate this service will provide the additional capacity required to meet demand for long distance journeys to London. To facilitate this, interventions will be required to lengthen platforms at certain stations along the route. These interventions will, where possible be delivered alongside electrification works; as such, Phase 1 of this work will be complete in CP5, with Phase 2 (stations north of and including Leicester) planned to be delivered during CP6. Capacity improvements enabling the sixth LDHS path are planned to be completed during CP5. Passenger growth on cross-country, regional urban local routes can be met by train lengthening where required and will not require infrastructure interventions.

While electrification also delivers stated HLOS outputs regarding energy usage and operating costs, the project will additionally provide a freight route cleared to W6, W7 and W12 gauge. Freight growth, particularly along the Felixstowe to West Midlands corridor is the other key driver for infrastructure intervention in the East Midlands in CP6. While CP5 capacity schemes between Bedford and Kettering, and between Kettering and Corby will provide for additional freight paths along the North South route, growth in these paths along with an increase in freight from Felixstowe ports will exacerbate capacity constraints in the Leicester area. A package of interventions have therefore been proposed for this area to remove conflicts between east-west (freight) and north-south (passenger and freight) flows and provides additional regulation points for freight services to provide additional pathing options and improve performance.

East Coast Main Line

For London and the southeast, the East Coast Route Study is looking at the strategic requirements for suburban services to Moorgate and Kings Cross. This part of the route also supports outer suburban services from Peterborough, Kings Lynn and Cambridge, and the growing long distance commuter market from places such as Grantham and Newark.

The new East Coast franchise will offer an additional 12,000 seats on 65 new Intercity Express trains, and it is anticipated that growth in demand will continue, supporting further investment in new rolling stock but further increasing pressure on the infrastructure. The southern part of the East Coast Main Line (ECML) is one of the first parts of the national network due to be made compatible with the ETCS (European Train Control System) during CP6. This will offer opportunities to bring digital railway solutions to bear on capacity constraints.

Demand analysis to 2023 indicates that growth on the peak inner suburban services to Moorgate will quickly outstrip current capacity, but could be accommodated through higher capacity rolling stock being procured as part of the current TSGN franchise. To accommodate that rolling stock, additional turnback facilities will be required at Stevenage. This is an enhancement that will be recommended as a priority for delivery in the next control period.

Analysis shows that significant growth continues through the period to 2043. The route study will consider the impact of accommodating additional services on the Moorgate branch infrastructure, which is known to be operating close to its design limits. Again, digital railway solutions will be key to enabling the high frequency metro-style service needed here.

The route study is also looking at how forecast growth on outer suburban routes impacts service levels: the need to balance sufficient capacity whilst minimizing the time passengers have to stand on longer journeys will focus the range of enhancement options. Given the current numbers of trains using the main line, infrastructure interventions will be required to accommodate the additional train paths identified as required by 2043.

For the services using the ECML into Kings Cross, the challenges are to accommodate long distance high speed services along with freight and outer suburban traffic carrying passengers from Peterborough, Cambridge and beyond. This mix of traffic focuses attention on pinch points such as the two-track viaduct near Welwyn. The high cost of civil-engineering solutions here will mean that options that can improve traffic management will be attractive.

The strategy to increase line capacity by finding ways to run trains closer together naturally places greater emphasis on infrastructure resilience and performance management. The future railway serving Moorgate and Kings Cross will have to run closer to maximum capacity, more of the time; that means that the infrastructure put in place will have to be specified to be more reliable. Robust industry-agreed procedures for managing perturbations to the timetable will also be important.

Chiltern Main Line

Under the Chiltern Railways franchise there has been significant investment in infrastructure and rolling stock which has led to considerable growth in demand on the Chiltern Main Line. It is likely that sufficient capacity can be provided on-train to meet demand through to the end of CP6, however there will be the need for interventions at London Marylebone to meet forecast passenger growth and facilitate passenger circulation and interchange with London Underground, for example the extension and reconfiguration of the gateline and relocation of concourse facilities.

The West Midlands & Chilterns Route Study is in development and is not due to report in draft until spring 2016. However, it is likely to identify that within and beyond CP6, further growth on the route is likely to be particularly constrained by flat junctions between Princes Risborough and London Marylebone, and two key factors at London Marylebone itself:

- The passenger capacity of the station
- The number and length of trains that can be accommodated into the station (and the difficulty of expanding a physically constrained station approach and footprint)

The Route Study is expected to also identify an option to enable some Chiltern Main Line services to divert via an enhanced Wycombe Line to an alternative London terminus at Old Oak Common. In addition to easing capacity at Marylebone, this would provide additional and improved connectivity from locations served by the Chiltern Main Line to High Speed 2 and Crossrail services. A solution is required for London Marylebone in CP7, however it is likely to be appropriate to develop and deliver the latter option in conjunction with the Old Oak Common station and in readiness for High Speed 2 Phase 1 opening in 2026.

Beyond the immediate Marylebone area, in the longer-term (for example from late CP7/the late 2020s), we would foresee a modernisation of the route to provide increased capacity and opportunities for improved journey times and performance through a package of enhancements including electrification and the implementation of ETCS as part of the Digital Railway programme.

Potential electrification of the main line highlights the need to consider options for the Metropolitan line from Amersham to Marylebone.

West Coast Main Line

The key issue for the West Coast Main Line (WCML) is the construction of HS2, with Phase 1 planned for 2026 and Phase 2 in 2033. It is anticipated that the LTPP will fully assess the implications for the WCML once the route decisions for Phase 2 are confirmed. An industry study (Capacity Plus) is currently underway to develop strategic options for train services on HS2 and WCML for HS2 Phase 1.

From a WCML perspective, the need for HS2 is based on capacity. There are three capacity challenges on the WCML:

- Capacity for future growth in commuting to London Euston, predominantly on the WCML Slow Lines.
- Demand by franchised and open access operators for additional long distance services, both to existing destinations and for through services to new destinations. The underlying driver is the need for improved connectivity.
- Capacity for freight growth, especially intermodal traffic.

Significant demand growth is expected to continue, with options to increase capacity very limited. In the short term, a programme of train lengthening will be required to meet demand but this will only be sufficient on parts of the route until the mid-2020s.

Given the mixed traffic and stopping patterns on the route, the WCML is effectively full at current levels of performance, over a number of key sections. The Network Rail report *West Coast Main Line and Trans-Pennine Capacity and Performance Assessment* concluded that with the current traffic mix and stopping patterns, there was little spare capacity for additional fast line paths. The report indicated a maximum of one fast line path may be available with a modest overall impact on PPM. Even if growth could be achieved on existing services, the full range of aspirations for additional passenger services (franchise and open access) cannot be accommodated.

Beyond the mid-2020s, a fundamental step change in capacity provision will be required. Although train lengthening schemes are required to increase capacity, the total capacity does not make the step change necessary to meet future demand predicted. That step change in capacity is provided by HS2 from 2026, releasing significant capacity on the WCML Fast Lines.

What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Crossrail 2 has the primary objective of improving public transport connectivity to key opportunity areas in London and the southeast, promoting economic growth in the region. The project will also address significant existing capacity constraints on the national rail network, particularly on the SWML from London Waterloo, and the West Anglia Main Line (WAML) from London Liverpool Street. The project is consistent with rail industry long term strategy set out in the London & South East Route Utilisation Strategy (RUS) of 2011, the recently established Wessex Route Study and the soon to be published Anglia Route Study.

The route study process includes examination of alternative options that result in changes to benefits and expected capital and/or operational costs. These are assessed by a common methodology to provide choices and recommendations. Options to increase capacity on both the WAML and SWML and are set out in the relevant route studies, and summarised in the response to the preceding question.

Crossrail 2 is a substantial project with very significant benefits to the economy. Network Rail has been working with TfL to assess alternatives, including but not limited to those indicated in the route studies.

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8th January 2016

Railfuture response to consultation questions on 'London's Transport Infrastructure'

Dear Sir,

Railfuture is a national independent voluntary organisation campaigning for a bigger, better railway in Britain, so we welcome the opportunity to provide an informed response to the questions posed by the consultation.

We recognise the importance of the provision of a responsive growing railway in contributing to wider economic, employment and skills, social inclusion and environmental issues.

If you require any more detail or clarification please do not hesitate to get in touch.

Yours faithfully

Chris Page

Chris Page
Railfuture
Vice Chairman

www.railfuture.org.uk www.railfuturescotland.org.uk www.railfuturewales.org.uk
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Response to National Infrastructure Commission consultation 'London's Transport Infrastructure'

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two or three decades?

London has been an economic success based upon population and economic growth. This has in some way been sustained by London's legacy transport system but continued growth has led to a position where London is becoming a victim of its own success. Transport capacity has become a key issue with some major rail capacity schemes coming on stream in the near future, namely further London Overground, Crossrail (1 and 2) and Thameslink, together with continued investment in the Tube.

This investment will continue to sustain growth in the short term but further investments are necessary, particularly in two areas of National Rail general infrastructure: mostly radial plus addressing orbital links.

2. What are the strategic options for future investment in large scale infrastructure improvements in London –on road, rail and underground, including, but not limited to Crossrail 2?

Strategic investment, if it is to be strategic as apart from for example building more road based river crossings, needs to address the future economic and social sustainability of London.

As well as sustained investment in the Tube and improving the road network to accommodate a greater range of road users, the two areas issues of concern are outer London (and beyond) radial rail capacity and outer London orbital links (journeys currently mainly undertaken by car).

London radial rail links

Strategic investment in increased infrastructure capacity and operational resilience is needed on existing radial rail routes to accommodate the following:

- Increased capacity and frequency metro style London Overground operating within Greater London and some adjacent towns.
- Growing outer suburban services (in some cases Inter City also but alleviated by HS2) allowing for commuting and further growth in the provision of housing
- Further capacity (and journey time improvements) on key airport corridors serving Gatwick, Stansted and Luton
- Far greater operational resilience
- Better integration with orbital and Overground links away from London terminals.

London Orbital rail links

TfL's statistics show that the car is used for the predominant number of orbital trips, with bus sharing the same infrastructure not making significant inroads. Popular opinion was that rail

could not provide an effective solution here until the provision of the London Overground, now carrying a staggering 120m passengers per year.

Further strategic investment is proposed in infrastructure provision for orbital London links as follows:

- Better integration of the now existing London Overground London orbital route by provision of additional interchanges with radial routes and the bus network in particular at: Brixton, Old Oak Common (2 lines), Brockley and extension beyond New Cross (as at New Cross Gate)
- Provision of a second orbital London Overground route involving new route infrastructure further out from the centre than the existing route but well within the M25 corridor, connecting suburban centres such as Ealing, Kingston, Sutton, Croydon, Bromley, Lewisham, Woolwich (Crossrail), Barking, key North London interchanges (Underground and main line including Crossrail 2) and linking with the new centres of economic development at Old Oak Common, Stratford and Docklands
- Provision of further infill light rail routes, initially based on the Croydon/Wimbledon tram system again carefully integrated with Overground, rail and bus routes.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme

Crossrail 2 suffers from a similar issue as faced with Crossrail 1 ie lower ridership projections at the extremities than in the centre. Crossrail 1 also has a wider core from Paddington to Liverpool Street projected to the massive traffic generators of Stratford and Canary Wharf and Heathrow.

The key to increasing outer ridership on Crossrail 1 was integration with other routes. Two examples are quoted: Abbey Wood and Whitechapel. Abbey Wood in one sense is similar to interchanges from the national network but ridership is boosted by Crossrail providing for other destinations than Central London, for example Canary Wharf. Whitechapel was added later to provide interchange with the orbital London Overground line (as well as the Tube) and is now projected to be one of the busiest stations on Crossrail 1.

It is proposed that to achieve increased ridership, Crossrail 2 should include:

- Maximum integration with the orbital London Overground system, national rail, the Tube and a properly integrated bus service
- Integration with a new outer London orbital Overground system (proposed above)

It is suggested that delivery of Crossrail 2 in cost terms would be improved by:

- Reduction in the number of branches, particularly in South London (compensated by more or better interchanges)
- Provision of a client side team to oversee the project with a strong Network Rail component fully integrated into the project.

4. Funding and Financing

Railfuture is not an investment bank so comments in this area are confined to practical suggestions as seen from other projects.

It is clear that traditional Network Rail RAB style funding is not appropriate for the 'on network' or the new elements of such a programme. TfL is better equipped to undertake new construction, certainly any light rail element. However for Crossrail as a national project a special purpose vehicle and funding was proposed to deliver the project. The weakness with this arrangement is the contracted Network Rail element. In the case of Crossrail 2 this gains particular significance so a straight read across to adopt the Crossrail model is not right either.

Railfuture has responded to the Connecting Northern Cities consultation and sees provision of infrastructure projects in London as on a similar basis with a special purpose client side body including Network Rail, Highways Agency and TfL with a degree of stakeholder participation from the London boroughs. TfL and DfT/Treasury would be principal sponsors.

Ring fenced funding would be a function of the benefits and the beneficiaries of such benefits, achieved as with Crossrail from government (as currently funded by Network Rail, TfL, the farebox and benefits to businesses and housing either hypothecated or by specific local taxation). The workstream on this is sizeable on previous experience, but probably worth it.

5. Have other metropolitan areas in other countries responded to similar challenges and priorities? Are there any responses to be learned and applied to London

Other than the obvious, but relatively simple cases in land ownership and governance terms of Hong Kong and Singapore, London itself in the form of TfL is probably the best example of derivation and implementation of a strategic transport solution set against wider economic criteria. TfL has through the London Overground and Crossrail 1 developed into the area of national rail sponsorship and projects although the structures here may be somewhat different.

Paris RATP has formed a strong partnership with London and has applied a very long term strategic approach of sustained investment. More particularly RATP is well advanced in the sustainable provision of orbital services with its fast developing orbital light rail projects. Like London, Paris has had a difficult relationship with SNCF/RFF as providers of national rail infrastructure.

New York, for years a traditional system like London has also embarked upon a series of major transport infrastructure projects designed to increase capacity and resilience of the system. The strengths of this example are in the area of coping with complex stakeholder and governance systems, hampered by geography in that a key part of the catchment area of the city is in a different state -New Jersey. This has in the recent past led to some very ill conceived transport projects, but New York has delivered generally in a very much more complex stakeholder scenario than London. New York had also set up a major projects division to deliver large infrastructure projects.

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8th January 2016

National Infrastructure Commission (NIC): Call for Written Evidence

Introduction

RICS – Royal Institution of Chartered Surveyors - is pleased to respond to the above consultation. Intelligent infrastructure planning is vital to the social and economic health of the country, and the creation of the NIC to identify the UK's infrastructure priorities is hugely welcome. The Commission now needs to fulfill its potential, and our response sets out some of our ideas on how this can be achieved.

RICS is the leading organization of its kind in the world for professionals in property, construction, land and related environmental issues. As an independent and chartered organization, RICS regulates and maintains the professional standards of over 100,000 qualified members (FRICS, MRICS and AssocRICS) and over 50,000 trainee and student members.

It regulates and promotes the work of these property professionals throughout 146 countries and is governed by a Royal Charter approved by Parliament, and monitored by the Privy Council, which requires it to act in the wider public interest.

Since 1868, RICS has been committed to setting and upholding the highest standards of excellence and integrity – providing impartial, authoritative advice on key issues affecting businesses and society. RICS is a regulator of both its individual members and firms enabling it to maintain the highest standards and providing the basis for unparalleled client confidence in the sector.

RICS and Infrastructure

Our members are integral to providing the necessary project management and cost savings through the whole life of infrastructure projects. They use professional standards and relevant guidance, as well as benchmark data, to deliver projects on time and on budget. This ensures that infrastructure projects are considered, planned for, financed and executed appropriately, crucial to ensuring business and investor confidence. In addition, we can provide expertise on spatial planning and locational investment to equip the Commission to make effective strategic choices on the UK's infrastructure priorities.

We were at the forefront of calling for a National Infrastructure Commission to develop a long-term strategic approach to the UK's infrastructure needs, and the establishment of the Commission last year was a highly intelligent step towards achieving this. We are continually

developing our activities in the infrastructure sphere and will work closely with the Commission to meet the UK's infrastructure needs.

We are unique amongst the professional institutions for the built environment in the breadth and depth of our understanding across land, property and construction. We also have strong working relationships with other organisations across the sector, and are uniquely placed to engage with the Commission to develop a holistic strategic approach.

It is in this spirit that we have launched the [Infrastructure Forum Steering Group](#), which is designed to give a voice to the best practice commercial delivery on UK infrastructure projects, and to lead a significant forum of professionals who seek to maintain and enhance value outcomes for lower levels of expenditure. The membership of this group includes leading figures from across the built environment, not just RICS members, and can be an invaluable source of advice, expertise and input for the work of the Commission.

Our President-Elect Amanda Clack plays a leading role in the infrastructure sector as Head of Infrastructure at EY. Her previous experience of working across land, property and construction for PwC gives her a unique insight into the issues involved, and she has written extensively on the challenges that need to be overcome if we are to deliver the UK's infrastructure requirements. Amanda has steered our infrastructure work and will continue to do so when she becomes President later this year. Her appointment as President will be another opportunity for RICS to support the work of the NIC and we look forward to continuing our collaboration.

This submission addresses a selection of the questions raised in the call for evidence. We have engaged widely across the sector in formulating the response, which is based on a large number of research papers, thought leadership pieces and other documents which can be provided to the Commission upon request.

Connecting Northern Cities

1. To what extent are weaknesses in transport connectivity holding back northern city regions (specifically in terms of jobs, enterprise creation and growth, and housing)?

Our members strongly perceive the lack of sufficient connectivity between northern city regions to be a severe constraint on economic growth and a threat to the realisation of the Northern Powerhouse. The 2014 Report produced to support the Higgins Review of HS2 – *Transport Constraints and Opportunities in the North of England* – identified many of the costs associated with the relative weakness of connectivity infrastructure in northern regions – specifically between the large city regions. For example, commuting between Manchester and Leeds is found to be 40% lower than would be expected given the size, location and socio-economic profiles of the two city regions¹. This is largely due to prohibitive transport costs associated with such commutes, in the form of longer journey times and ticket prices. This has a real knock-on effect in terms of labour mobility, the flexibility of the housing market and business creation.

¹ Steer Davies Gleave, *Transport Constraints and Opportunities in the North of England*, 2014

The problem of connecting northern cities is particularly significant because, in common with all areas of the UK, the economic health of the region as a whole is dependent on economic growth within its largest cities. Urban areas benefit from the advantages associated with the concentration of jobs and enterprises within a specific area. Productivity is higher in urban centres, with output per worker 15% more than in rural areas. The five largest Northern cities of Manchester, Liverpool, Leeds, Sheffield and Newcastle account for 60% of the region's Gross Value Added (GVA), and for this strength to be leveraged for the benefit of the whole region, the transport infrastructure connecting them needs to be radically improved.

Infrastructure spending per head in the North is vastly lower than in London. For example, whilst the figure for London is £5,426 per head, the North West receives £1,248, Yorkshire and the Humber £581 and the North East a mere £233². Whilst it is understandable that investment in the capital is very high, the disparity needs to be addressed if the government is to achieve its stated objective of rebalancing the UK economy and unleashing the potential of the Northern Powerhouse.

2. What cost-effective infrastructure investments in city-to-city connectivity could address these weaknesses?

The announcement in the Autumn Statement that HS2 will extend from Birmingham to Crewe 6 years earlier than initially planned was very welcome given the need for certainty and clarity over investment plans. Our members were also pleased to see the funding for Transport for the North (TfN) confirmed at £50 million as part of an overall transport budget of £13 billion.

The simple fact is that the Northern Powerhouse does not at present have any real meaning as a coherent entity due to the excessive travel times between its various regions. For example, a rail journey from Newcastle to Manchester takes 2-3 hours, whilst a journey from Liverpool to Hull takes 3 hours. This is in stark contrast with the south, where journeys of similar distances typically last less than 2 hours. To address these issues, the Manchester-Leeds transport corridor needs to be improved, and cities currently outside of major planned developments such as HS2 need to be better integrated into the system as a whole. Road transport should be similarly improved, as the motorway network currently suffers from many of the same shortcomings as the rail system.

It should also be recognised that there are significant gains to be made from improvements to the existing infrastructure – connectivity improvements between northern hub cities will not always necessitate entirely new projects. Too often infrastructure is seen as being synonymous with brand new schemes, and the benefits of maintaining and improving existing transport links should not be underestimated.

3. Which city-to-city corridor(s) should be the priority for early phases of investment?

² IPPR North, *Transformational Infrastructure for the North*, 2014

As is referred to above, the economic health of the North as a whole depends on stronger transport links between all of its core cities. Until connectivity between cities such as Newcastle, Liverpool and Hull is improved to create a single, coherent economic unit, there is no incentive for policymakers in any of these regions to agree to investment in improvements in other areas when their electorate or employees cannot benefit because travel times and fares put jobs there out of reach.

The concept of a HS3 corridor between Manchester and Leeds would be a good starting point, but it is vital that the concerns of other cities are also addressed. In particular, there is a perception in the North-East that cities such as Newcastle, Sunderland and Middlesbrough could be left out of the equation as the Northern Powerhouse agenda proceeds. These cities must be given careful consideration as the network as a whole is developed.

4. What are the key international connectivity needs likely to be in the next 20-30 years in the north of England (with a focus on ports and airports)? What is the most effective way to meet these needs, and what constraints on delivery are anticipated?

In terms of the North East of England, the joint report 'Faraway so close: the North East as an international gateway' from IPPR and NECC puts forward a well-argued case for the development of North East ports and airports to create a better international gateway on the eastern side of the country (<http://www.ippr.org/publications/faraway-so-close-the-north-east-as-an-international-gateway>). This would underpin the development of manufacturing in the region, which remains the only English region with a consistent positive balance of trade.

5. What form of governance would most effectively deliver transformative infrastructure in the north, how should this be funded and by whom, including appropriate local contributions?

A major threat to the delivery of a coherent and integrated transport system for the North is the fragmentation of governance structures. As has already been stated, the Northern Powerhouse is not (and arguably can never be) a monolithic entity. The region comprises numerous different cities and areas with different agendas and priorities; the creation of a successful infrastructure network serving the whole of the north requires that these disparate areas cooperate and coordinate with one another.

The establishment of TfN was a welcome step in terms of the strategic oversight it can provide for transport infrastructure in the north. It is vital that this body works closely with industry leaders and elected Mayors in ascertaining the needs of the region, and the RICS is willing to provide support and advice. At present TfN is very much public-sector dominated and it must work in close partnership with the private sector if it is to be effective.

The devolution announcements made by the Chancellor last year were a bold statement of intent with regards to shifting power from Whitehall to local authorities, and could be the start of a process that allows all regions of the UK to fulfil their potential. In practice, the delivery of City Deals now needs to ensure that fragmentation is avoided. For example, whilst directly elected

Mayors can provide effective local leadership in delivering infrastructure developments, they could also result in competing demands and conflicts of interest which hinder developments of regional and national strategic importance. Mayors will need to recognise the value of collaboration, and the NIC should make a compelling case for cooperation between cities when publishing its National Infrastructure Assessments.

The granting of powers over business rates to elected Mayors, giving them the power to increase the rate by 2% to fund major infrastructure projects (in agreement with local businesses) is a welcome incentive for Mayors to take ownership of development in their regions. By decoupling infrastructure spending from the vagaries of direct government grants, this should help northern cities take a more flexible and strategic view of long-term infrastructure requirements, and again this is an area where the recommendations of the NIC can add significant value. However, more clarity is needed on whether the increased funding from business rates retention and the power to increase rates will be sufficient to meet any shortfall from the reduction of direct grants. The final funding settlement needs to ensure infrastructure spending is protected.

London's Transport Infrastructure

1. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

The Government's Construction 2025 strategy set ambitious targets to reduce costs by 33% and delivery times by 50%. For these ambitions to be met on large-scale strategic infrastructure projects like Crossrail 2, delivery needs to be significantly improved – around 75% of capital projects are still reported as going over budget. The surveying professionals represented by the RICS, particularly commercial managers and quantity surveyors, are indispensable to the achievement of cost savings on the scale required.

A key element of the Construction 2025 strategy is the creation of an infrastructure sector “underpinned by strong, integrated supply chains and productive long term relationships”. To explore how this vision can be realised, RICS are currently working on a number of high-level Insight Papers to be published over the next year, across Building Information Modelling and Engineering, SME Engagement, Skills & Training, Team Building, Procurement, and Whole Life Cycle Costing of Rail Assets. The findings of these papers will apply to all rail projects, and will be especially applicable to the delivery of Crossrail 2.

The working hypothesis underpinning these Insight Papers recognises that the rail infrastructure industry is naturally fragmented but that better alignment could be secured through reaching a better understanding of enablers and measures (e.g. technology, policies, and training) and by focusing on ways of removing such barriers.

In addition, some of our members have expressed the desire to see stronger links between Crossrail 2 and Gatwick Airport as a way of improving access from across the capital and by extension, across the South-East more broadly.

2. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

The past decade has seen some major strategic successes in the delivery of large-scale infrastructure projects in the capital, most notably on the 2012 Olympics and Crossrail. These achievements were made possible because they were based on a political consensus, a bold strategic vision, and they made effective use of innovative public-private delivery partnerships. Future infrastructure projects need to recognise what went right in these cases and where possible, replicate their experience.

The successful delivery of infrastructure requires both public strategic oversight and private delivery and funding mechanisms. The benefits of infrastructure for private investors are primarily the scale, longevity and certainty of long-term returns, and the NIC should assess how the full potential of private investment in the sector can be unlocked. We have already written to Commercial Secretary to the Treasury Lord O'Neill offering to convene a review of the barriers to infrastructure investment through collaboration across the built environment professions. Infrastructure cannot be entirely reliant on international investment and pension funds, and we are willing to work with the Commission to explore in-depth how funding can be obtained from other sources.

Electricity Interconnection and Storage

1. What changes may need to be made to the electricity market to ensure that supply and demand are balanced, whilst minimising cost to consumers, over the long-term?

The most effective way to minimise cost to the consumer is to ensure that as new forms of energy come forward, they are delivered in a technology neutral manner deploying the lowest cost generation mix. A mix of intermittent and base load needs to be delivered with the true cost of carbon being accounted for, coupled with the likelihood that currently all forms of new generation need some form of market support mechanism.

In the short term given the lack of new generation and investment coming forward, there needs to be certainty for investors in new generation, something that the ongoing changes to renewables and CCS funding have severely affected.

Balancing supply and demand will require the mix of generation types, whilst the meeting of climate change targets will require continued deployment of renewables alongside other new low carbon base load. In the short term the premature closure of existing thermal coal plants will adversely affect supply/demand and balancing if these plants are taken off line before there is a

clear pathway to delivering fossil fuel plants with carbon capture and storage. If an SO can assist in achieving these objectives then it will be of benefit.

2. What are the barriers to the deployment of energy storage capacity?

The energy storage sector within the UK is immature and requires policy, regulatory and market support mechanisms to ensure that the long-term investment required can be delivered.

There is a need for storage technology at all of levels. For those that would work within the transmission network and distribution network scales, the investment will be significant and therefore needs clear government focus and support to ensure that new storage investment and technologies are able to come forward and work effectively within the current UK market mechanism.

3. What level of electricity interconnection is likely to be in the best interests of consumers?

Interconnection plays an important part of the UK supplier/demand arrangements, but there appears to be an increasing over-reliance upon interconnection with mainland Europe rather than bringing new generation capacity on stream within the UK. There are a number of implications of this, including over reliance on non-UK generation at the time of tight capacity margins. They do nothing to stimulate investments into new UK-based low carbon generation, whilst adding to carbon leakage as emissions have the potential to become 'offshored'. For example, fossil fuel plant within the UK has to bear the significant extra cost of the UK's unilateral carbon floor price, whilst fossil fuel generation in Europe does not bear the same level of carbon taxation, and is able to export into the UK via interconnectors.

Yours faithfully

[contact redacted]

Royal Borough of Greenwich

Response to the National Infrastructure Commission call for evidence

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

The challenges facing London over the next two to three decades are well documented and are wholly related to population growth. It is recognised that the greater part of this growth is going to take place in East and South-East London. The challenge is to provide the necessary housing mix and social and transport infrastructure to support and facilitate that growth in a timely way.

In recent polling commissioned by London Councils, Londoners named housing, health and schools as their top three infrastructure priorities, as well as strong support for investment in the 'unseen' infrastructure that is vital to the city's functioning – waste, energy, digital and flood defences.

London Councils' polling indicates that 88% of Londoners believe there is a housing crisis. The challenge is to increase the supply of new housing, and particularly affordable housing, at the same time as increasing (primarily public) transport infrastructure and services so that existing and new populations have good access to employment opportunities and other facilities.

The additional challenge in south and south east London relates to convergence. It is clear that, overall, residents have lagged behind the London average in terms of educational attainment, wealth, health and life chances. The challenge is to ensure that growth takes place in a way that supports convergence.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

- How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?
- What might their potential impact be on employment, productivity and housing supply in London and the southeast?

The Royal Borough believes that there a number of strategic transport infrastructure schemes and initiatives that London needs..

We believe that transport schemes that will unlock housing numbers and growth in jobs and businesses and facilitate convergence should be prioritised. Transport schemes are not ends in themselves, but are a vital part of the wider infrastructure the city needs to provide for its residents and businesses.

The Commission will recognise that schemes such as the Jubilee line and Docklands Light Rail extensions and have unlocked areas of London for growth and regeneration and that Crossrail is already having a positive impact. However it is clear that further investment infrastructure is needed.

East River Crossings

The completion of a package of additional vehicular and public transport River Crossings, in east and South-East London needs to be prioritised in order to support growth and development in East London.

A package of crossings, constructed from west to east to match the direction of growth, would link new areas of population growth, such as Kidbrooke, with areas of employment opportunity and would support the sustainable development of areas such as Thamesmead where poor accessibility has hampered growth.

The proposed Silvertown tunnel will support growth and employment and improve resilience but needs to incorporate a DLR extension between the residential areas of Eltham and Kidbrooke and emerging employment opportunities north of the river if benefits are to be maximised.

Additional river crossings, including schemes such as the Gallions Reach crossing and extensions of the DLR and London Overground to Abbey Wood and Thamesmead, would provide access to London's wider transport network and support growth and development those areas at a fraction of the cost of schemes such as Crossrail 2 and add further benefit to those that will be secured through Crossrail1.

Additional local vehicular crossings are needed to support business growth but must be built with integrated public transport and be supported by walking and cycling routes so as to ensure that the use of more sustainable transport modes is encouraged in order that air quality is improved and local amenity sustained.

Change of responsibility for Rail

A change in the governance arrangements around Rail in London needs to be a strategy priority. The responsibility for managing rail services in London needs to be delegated to the Mayor for London at the earliest opportunity. The current franchise system simply does not support the growth and development of London and has not provided the services that Londoners deserve.

The transformation of the North London Line when it became part of the London Overground service shows what can be done with Mayoral control, focus and investment. The London Overground handled over 143m journeys last year, an increase of 7% over the previous year - demonstrating that Londoners need excellent "turn up and go" rail services.

A rail service managed by the Mayor would see joined-up London rail network with more frequent services and increased capacity, improve customer service with joined up travel information, more integrated fares and a more accessible network. It would enable local communities to have a greater local input into train services.

All this would support the economic and social vitality of London, particularly areas such as South- East London that are not part of the London Underground network .

However, a change in governance will not on its own result in a step change in rail performance, services and facilities. Further investment is required and needs to be prioritised in areas where existing operators have underperformed and have failed to invest. The London Overground is evidence that focussed investment in local rail services increases ridership and supports the more intensive growth and development that London needs.

Improve orbital routes in outer London

At present London rail and road infrastructure is too focused on getting people into central London and out again. The London Overground and the DLR extensions from Lewisham and Woolwich have, to an extent, supported growth in East London. Crossrail and the Silvertown Tunnel will provide further support.

However in the outer London boroughs a reasonable proportion of residents commute orbitally to work in another town centre or outer borough. Town centres in outer London such as Woolwich, Eltham, Kingston, Sutton, Croydon and Bromley would benefit from improved public transport and light rail links between these areas.

Investment in efficient orbital public transport needs to be prioritised to support the growth and vitality of outer London town centres and to free up capacity on radial services which are too often used by passengers seeking to make orbital journeys.

The success of the Croydon tram-links is evidence that investment in light rail can support orbital movements between outer London town centres, encouraging growth and development and reducing car dependency.

Crossrail

It is clear that the opening of Crossrail will represent a step-change in London's transport arrangements particular in the northern part of the Royal Borough where access to emerging employment areas has been constrained.

However priority needs to be given to opportunities to extend Crossrail so as to improve access to emerging growth areas. In the south-east priority needs to be given to an evaluation of the benefits of extending Crossrail to Ebbsfleet.

Crossrail 2

Crossrail 2 is needed to address severe capacity constraints that will exist on the London Underground and mainline Network Rail services such as those into London

Waterloo. When High Speed 1 is complete, Crossrail 2 is needed to provide capacity to allow those passengers to transit easily through London Euston. Crossrail 2 will support significant numbers of jobs and housing along the line and provides general regional connectivity, which at present is only offered by the Thameslink line. Crossrail will improve this but more rail lines which negate the need to use the tube will have wide benefits for the rail and tube network in London as a whole.

An improved bus network

Whereas investment in major transport infra-structure projects such as Crossrail is critical for the economic prosperity of London and the UK priority needs to be given to enhancing and improving the bus network.

Bus infrastructure and services can be more responsive to local needs and developments and should be prioritised for continued investment. There are countless examples in the Royal Borough where new bus services have proved to be oversubscribed shortly after opening and have needed to be enhanced.

Investment needs to be prioritised in a mechanism, particularly in outer London, which is more responsive to changing local circumstances.

Cycling and walking

Although the Commission is focussed on large – scale infrastructure projects there is evidence that investment in cycling and walking is also essential to support the growth and economic vitality of London in a sustainable way. Any major infrastructure scheme must be fully integrated into the local bus, walking and cycling network. Moreover, away from the major transport hubs, continued investment in walking and cycling networks is required to reduce car dependence, improve air quality and encourage healthy lifestyles.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Crossrail 2 would assuredly support the necessary growth and development of London and produce a step-change in transport capacity it would not directly impact on the Royal Borough of Greenwich.

Accordingly the Royal Borough has insufficient understanding of the Crossrail 2 business case to respond to this question and would refer the Commission to the response submitted by London Councils.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

- What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?

- What innovative funding mechanisms could be considered to support delivery of key schemes?

The funding mechanism for Crossrail is unique and has ensured delivery of a scheme that might otherwise not have happened. It should not however be considered the default solution for Crossrail 2 or other similar infrastructure schemes.

The Royal Borough would expect the Commission to make recommendations to Government that (i) recognises that every transport infrastructure scheme will have a different distribution of benefits and (ii) based on an analysis of funding mechanisms utilised elsewhere in Europe and beyond.

Submission of the Royal Borough of Greenwich

7th January 2016

[contact redacted]



THE ROYAL BOROUGH OF KENSINGTON AND CHELSEA
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Tel: 020 7937 5464 Fax: 020 7938 1445

Councillor Timothy Coleridge
Cabinet Member for Planning Policy, Transport and Arts
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Mr Andrew Adonis
Interim Chairman
National Infrastructure Commission
1 Horse Guards Road
London
SW1A 2HQ

8 January 2016

Dear Mr Adonis,

National Infrastructure Commission Call for Evidence - Large Scale Transport infrastructure projects in London

Response from Royal Borough of Kensington and Chelsea

The Royal Borough has confined its comments to London's transport infrastructure and thought it would be helpful to set out the response in the light of our experiences with Crossrail 1 and 2. We have framed the response in terms of the impact on this borough as we believe this will be of most use to the Commissioners.

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

The main challenge facing London is accommodating a population predicted to increase to 10 million by 2030 within a limited metropolitan area, which has already resulted in hugely inflated housing prices.

This house price inflation is increasing geographical inequality forcing people to live in the less accessible, and therefore cheaper, parts of outer London making investment in transport infrastructure even more critical for the capital's future success. In the Royal Borough this is particularly marked as middle income groups can no longer afford to live here and the vast majority of the people who work in this borough have to commute in.

For population increase to be sustained there needs to be growth not only in residential units but in jobs and wealth as a whole. We would urge the Commission

not to take too narrow a view of how this might be achieved. It is not only in terms of additional homes. We have calculated that with the Crossrail 2 proposed station in the King's Road in Chelsea an additional 3,500 residential units with a GDV uplift of more than £7billion could come forward in the 40 year timeframe that has been allowed.

Account should be taken of the agglomeration effects of central London – namely the productive benefits that come when people and organisations from different sectors work closely with each other are realised to maximum effect. Without good communication and excellent public transport facilities in the next 20-30 years, this will simply not be achieved. As part of this submission we include an economic and productivity paper at Appendix A which demonstrates the social and economic benefits which would be achieved, or to put it more simply, what would be lost without a station in Chelsea.

For London to continue to compete as a World City the Mayor of London has made it abundantly clear in London Plan policy that the capital must maintain its reputation in a variety of world markets. Global competition will increase in the next 20 – 30 years. Success against this competition can only be achieved with a public transport system that has excellent coverage, ample capacity and that is fit for purpose. We believe that this is where a Crossrail 2 station at Chelsea can provide what no other station can. Chelsea has a world class medical hub which will need excellent accessibility to be able to evolve and remain dominant in the field of heart, lung and cancer research and treatment. The King's Road is a unique shopping and leisure destination. Chelsea also provides a home to some of the country's most influential people operating over a wide variety of disciplines that contribute to UK plc.

Chelsea is home to some of the people that help to power London as a world-class centre of economic activity and finance; these people help the capital to compete with other global cities like New York, Frankfurt and Paris. People who live in Chelsea most commonly work in the West End, the City and Canary Wharf, as Appendix A shows, so being able to use Crossrail 2 would considerably reduce their journey times, improving their quality of life and their potential productivity. However, it is essential both economically and socially, that a Crossrail 2 station is also provided for those households on lower incomes living in areas of higher deprivation such as Cremorne or the Sutton Estate.

Apart from significant benefits to the Chelsea medical Quarter Crossrail 2 would contribute to wider employment opportunities in the borough. Many of our schools, shops and offices are struggling to retain staff and this social trend is set to continue and intensify in the next 20-30 years unless there are excellent transport linkages in place.

Air quality is another significant challenge. Poor air quality is a factor in 1 in 12 deaths in the Royal Borough. With growing awareness of the health impacts of poor air quality, this could become a significant deterrent to living or working in central

London. Appropriate public transport facilities with CR2 being exploited to the full will help to avoid such a scenario.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

- How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?
- What might their potential impact be on employment, productivity and housing supply in London and the southeast?

Future investment in large-scale transport infrastructure must not be driven solely by project delivery requirements. It is vital that the full regeneration benefits of infrastructure investment are identified at the project's inception, and additional benefits are actively sought out throughout the project to ensure the maximum possible benefits are extracted from public investment.

In the case of this Borough we have presented evidence to DCLG (via the Community Budgets Project, see Appendix B) demonstrating that we have found it difficult to make our case heard for a fully funded Crossrail 1 station for Kensal Gasworks Opportunity Area, that would unlock development of a major brownfield site, because the scheme's joint transport sponsors TfL and DfT are only charged with delivering their defined project on time and on budget. Clearly, investment opportunities cannot be appraised properly if the regeneration aspect is not given appropriate weight or prominence.

Last summer we had to make a similar case to the HS2 Select Committee because that scheme was proposing to relocate a depot onto land that is needed to improve access to the Kensal gasworks site. Without this additional access route the capacity of the one remaining major brownfield site in this borough will be limited to about 700 homes. With the second emergency access it could accommodate over 4,000 homes.

Currently we are making the case that quite modest additional investment in track would increase the reliability of services on Crossrail 1 and enable delivery of a Crossrail station at Kensal Portobello that would unlock this site and deliver: over 4,000 homes; £2bn Gross Value Added and £2bn Gross Development Value. TfL and Network Rail are now actively considering this proposal but it has taken over seven years to get to this point.

We also think there may be merit in considering the varying productivity of individuals living in different areas when assessing investment decisions. The work we have undertaken for the Crossrail 2 Growth Commission has shown that the average salary of people living is at least Chelsea twice the London average. So the

value of their journey time savings should be calculated on this basis rather than the London-wide figure.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Some might be tempted to view the £27 billion project cost as a starting figure, to be pared back by the selective removal of some stations or sections of line. Indeed there is a group in Chelsea campaigning for removal of the King's Road station, and reduced cost is one of their justifications.

It is true that TfL could save around £1bn from capital costs without this station but this would be a short sighted and false economy. Initial calculations suggest that stamp duty alone from increased residential prices in the vicinity of the station and additional development that is likely to come forward (£720 million calculated over 40 years) would cover 70% of the cost. The overall redevelopment that might come forward, at a scale appropriate for the borough, could yield £6billion in additional Gross Development Value. This is before consideration of the Gross Value Added that this development would deliver.

As referred to in response to question one above, it is important to consider the type of people who live in Chelsea and would benefit from a station in King's Road. Average salaries here are 50% higher than London as a whole which means that the journey time savings would be in the region of £400 million (over 60 years), compared with £275 million based on London average earnings.

This is without considering other benefits which are more difficult to quantify like: shorter journey times improving staff retention; enhance employment prospects; increase in business rates; maintaining London's position as a global city; additional tax payments from households that might otherwise not chose to locate in London and; even more difficult to quantify, the health benefits resulting from improving air quality. It may be worth commissioning research to calculate these benefits for the whole line.

Crossrail 2 has already taken the decision to invest in the wider benefits that a regional, rather than a metro style route, can deliver. It would not make sense now to cut out a station that would serve a major retail and cultural centre, and the Chelsea Medical campus, which provides world-leading treatment for cancer, heart and lung disease, as well of one of London's premier residential districts.

We are working with the Crossrail 2 Growth Commission to quantify the benefits a station in Chelsea would deliver.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

- What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?
- What innovative funding mechanisms could be considered to support delivery of key schemes?

The funding currently identified for Crossrail 2 will come from fares, Mayoral CIL, Business Rate Supplement, Council Tax precept and over station development.

Knight Frank have identified that prime London Central London prices have increased by 13% over the market average within a 10 min (roughly 800m) walk of a Crossrail 2 station. Work undertaken by this Borough for the Crossrail 2 Growth Commission has shown that if there was a similar 13% increase in value additional Stamp Duty on properties around the proposed station at King's Road this would produce £7.5m p.a. in Stamp Duty or £300m over 40 years (£163m cumulative present value). So local retention of Stamp Duty, or at least retention of the increase in Stamp Duty, could be a useful funding stream.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

Whilst we do not have experience of how metropolitan areas in other countries have responded to challenges and priorities which are similar to London, we would urge strongly that the silo structure for delivering large infrastructure projects is broken down and such projects are delivered in a more creative and holistic manner. As outlined in our response to question 2 it has taken us seven years of tenacious hard work and lobbying to start to see real movement in getting a Crossrail 1 station at Kensal. This, despite the fact that we had, in principle support from the Mayor of London and the station appeared in our adopted Local Plan at the end of 2010.

We have also agreed to fund the cost of the station and it is key to optimising development of up to 4,000 residential units on the Kensal Canalside Opportunity Area. Despite housing delivery on Opportunity Area sites being possibly the prime consideration of the London Plan we have sadly experienced significant barriers for getting traction for the scheme. I am pleased to say that we are now making headway with the able assistance of Isabel Dedring, Deputy Mayor for Transport, but it has certainly been much harder work and more difficult than we feel it should have been.

Having so many different bodies and organisations involved in infrastructure delivery, all of which have different priorities and timescales has not assisted and there needs to be much clearer direction and thought given to such projects so that a key figure can act as a clear point of contact and has sufficient authority to push projects of importance through without them becoming bogged down in technical

detail which can nearly always be overcome. I suspect that the approach in many other countries is more coordinated. At least we have the benefit of a strategic authority in London. I would hate to think how any headway could be made outside London, given the current arrangements. I hope these comments will be of use.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Tim Coleridge'.

Councillor Tim Coleridge
Cabinet Member for Planning Policy, Transport and Arts

1. Background

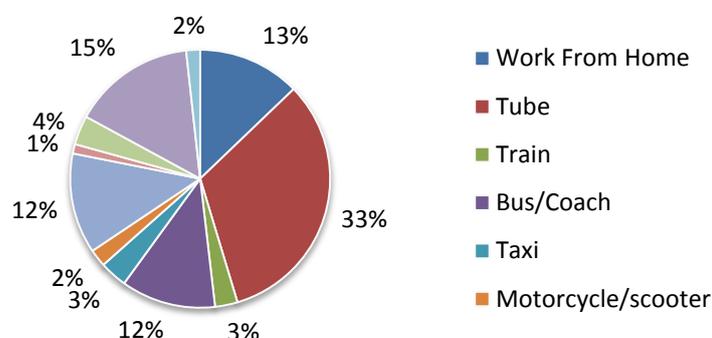
1.1 We have taken a 960m (12 minute) walk from the point of the station and considered a good distance for considering the socio-economic profile of Chelsea.

2. Travel

2.1 As is seen below, around a third of Chelsea residents use the tube to get to work. This is slightly higher than the Inner London average of 30 per cent. Whilst part of the impact will account for those living in the immediate vicinity of Sloane Square station, this still indicates that there is a strong demand for our residents to use mass transit systems to commute.

2.2 Over 2000 (12 per cent) use the bus. This number could be cut significantly should a Crossrail2 station come forward on the Kings Road, Potentially; the number of people travelling by car could also come down. Including taxis, car usage equated to 15% of residents.

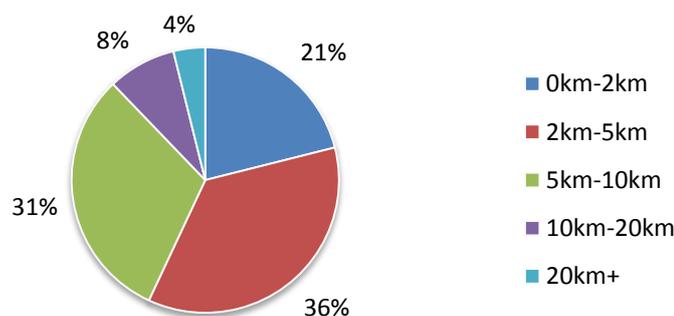
Mode of travel to work



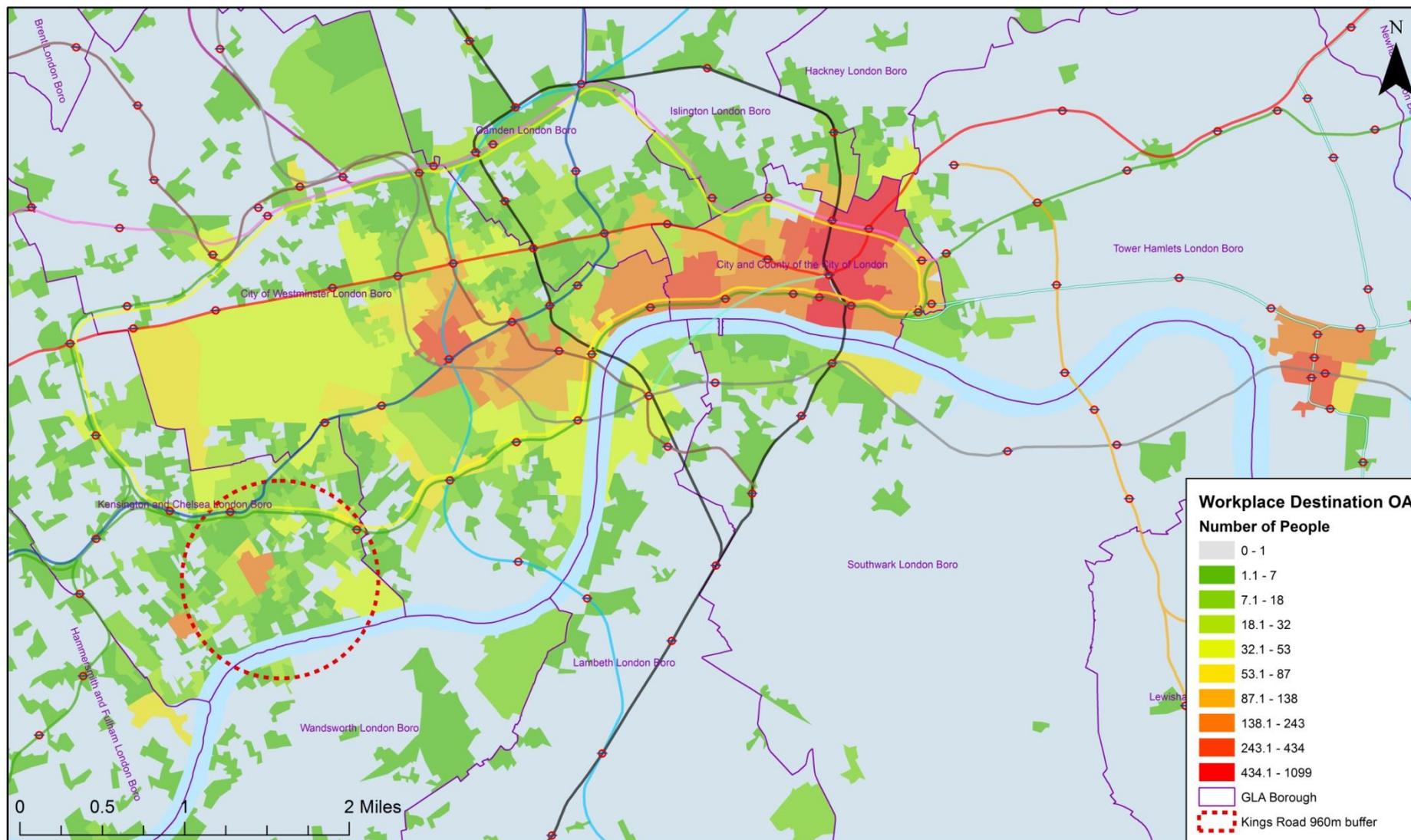
2.3 To understand who benefits from Crossrail 2, it is important to consider where people are working and how far they travel. The chart below considers the comparative distances that the residents of Chelsea travel to get to their place of work. The map on the following expands on this further Indicating that the majority of residents within the 5-10km bracket tend to be working in the City or West End and the majority of those travelling 10-20km are likely to be working in Docklands. Combined, this equates for 39% of the population.

2.4 The long journey times between Chelsea and key employment centres is only part of the problem in making Chelsea a more desirable place to commute from, the crowded services on the District and Circle Lines also make travelling between home and work less appealing.

Distance travelled to work



Census 2011 - Location of workplace at OA level from Kings Road buffer



Title: Chelsea



Ref: 000004082015

Author: Oliver Turner

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Date: 05/08/2015

Status: Final

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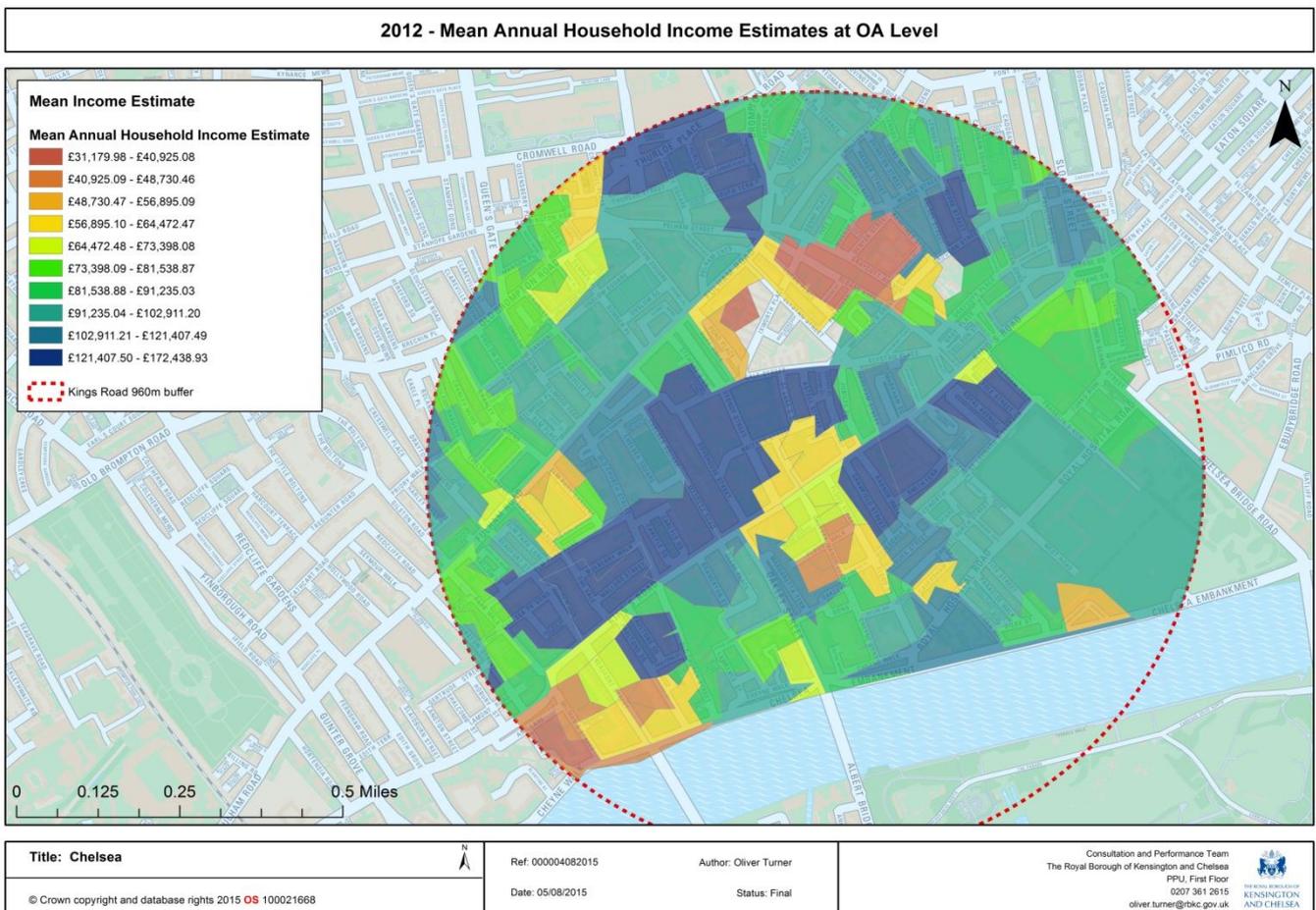
3. Employment and educational attainment

3.1 Having understood where people are travelling, it is important to understand more about the kind of work in Chelsea. Ward level data shows that between 40 and 50 per cent of residents work in professional occupations, or are managers and directors. This is significantly above the London average of 34 per cent. This is reflected in the map below which highlights the average household income of residents in the area.

3.2 This broadly tallies with the level of educational attainment in Chelsea. This shows that 55 per cent of those living in the catchment area (17,311 people) are educated to at least degree level, compared to the national average of 30 percent.

3.3 For the most part, incomes in this part of Chelsea exceed the borough, city and national averages at over £110,000 p/a. When coupled with the data on location of workplace, this paints a picture that Chelsea is home to some of the people that make London a world class centre of economic activity and financial powerhouse; helping the Capital to compete with Global Cities like New York and Paris. London needs Chelsea to provide a high quality and unique residential environment for its most productive residents and Crossrail 2 can deliver this.

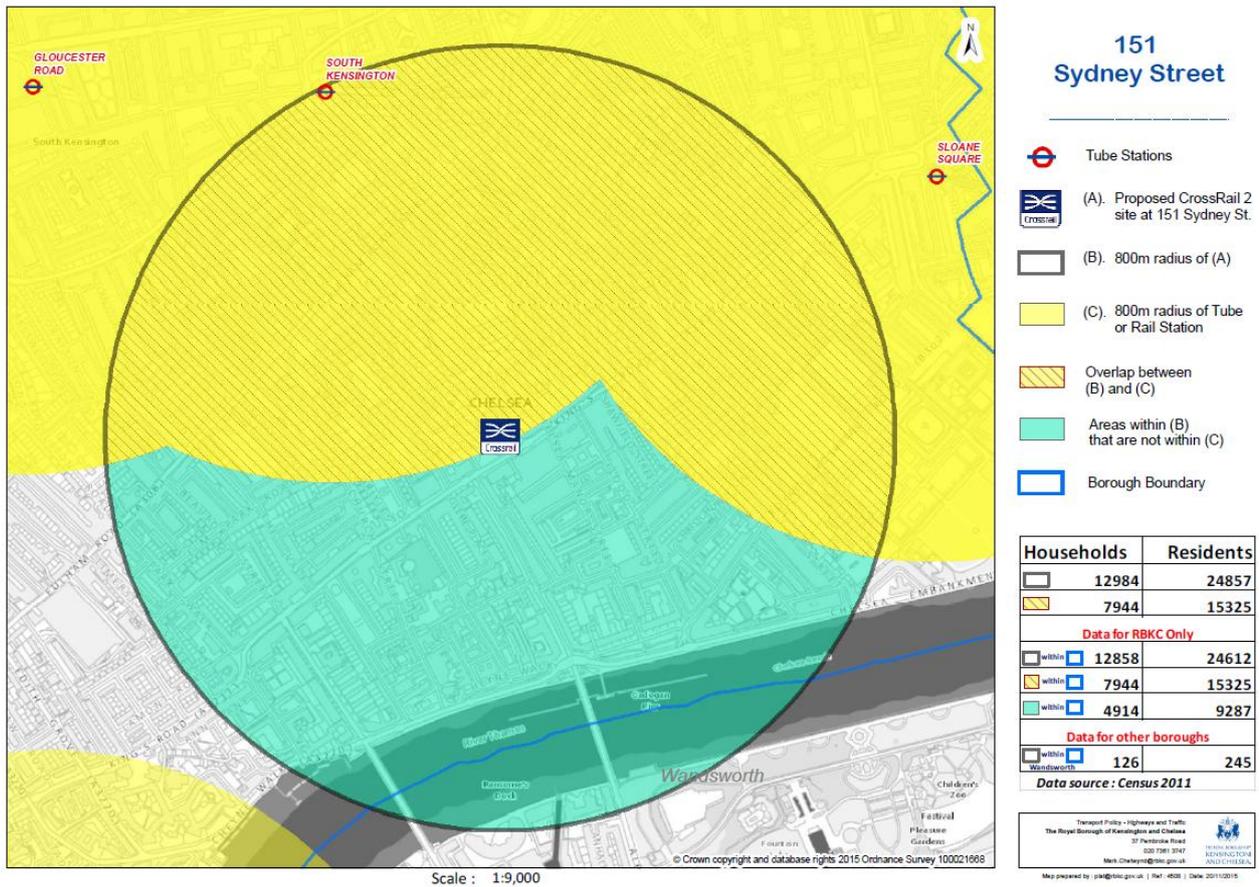
3.4 However, it is important to note that Crossrail 2 will also unlock accessibility for those households on lower incomes, living in areas of higher deprivation such as Cremorne or the Sutton Estate. Being within a 12 minute walk of a station on the King's Road will improve accessibility to jobs and opportunities elsewhere in London; helping to tackle the stark contrast of inequality in Chelsea.



4. Economic impact

Additional development

- 4.1 At present, it is estimated that there are 12,000 households within an 800m radius of a station around the Fire Station. Whilst slightly tighter than the 960m radius used in the previous section, this distance reflects a 10 minute walk and is a more directly appropriate scale for considering the immediate sphere of influence for the station.
- 4.2 Within this radius, nearly 5,000 homes are not currently within a 800m walk of an existing station. It is fair to assume that these properties stand to benefit the most from a station.



- 4.3 However, we must also consider the impact of the station on new development. It seems fair to assume that the station is likely to create even more interest from housebuilders.
- 4.4 The Borough is mindful that any development must respect the rich heritage assets that exist in and around the King’s Road but assuming this can be achieved it would be reasonable to assume densification could still happen whilst preserving Chelsea’s unique character.
- 4.5 Transport for London has assumed that roughly 850 new units could come forward. However, it the Council’s belief that in theory, as many as 3464 could be developed as the plan on the following page indicates.



4.6 This figure represents a maximum and is designed to look at capacity rather than a detailed urban design framework. Clearly, not all of these sites are available for development and nor would the Council support this level of disruption in light of the current flurry of construction in the south of the Borough. However, over the course of a 40 year period, it is not unreasonable to think that at least some of these sites will be developed. Averaged out, this equates to around 90 new units per year, just over 10 per cent of the borough's current annual housing target set by the Mayor.

4.7 The 2015 Zed Index notes that the average house price in SW3 is around £2.35 million and price per square foot of £1,900. This figure is used as a broad rule of thumb to understand the value of development in the local area.

4.8 This indicates 3464 new units would yield £6 billion NPV in Gross Development Value.

4.9 Admittedly, these are high-level assumptions based on the maximum return possible and we have not, as yet, made assumptions regarding build costs or affordable housing. Due to the Council's aspirations to deliver new affordable housing as part of the already committed estate regeneration programme, the strategic, borough-wide approach to affordable housing adopted in this report's methodology is considered robust.

Property values

4.10 Unsurprisingly, as Chelsea provides homes for some of the Capital's most economically productive people, this is reflected in the area's property prices.

- 4.11 Directly capturing the benefits within the housing market is difficult without some significant financial modelling. However, as a rule of thumb from the [2014 Nationwide House Price Index](#), those living within 500m of a station can expect a 10.5 per cent increase in property value, or 7.6 per cent if within 750m. We believe that due to the desirability of the Royal Borough, this figure could be even higher. The [recent study by Knight Frank](#) has suggested that between 2008 and 2014, Prime Central London prices within a 10 minute (roughly 800m) walk of a Crossrail station have increased 13 percent over the market average. This is in spite of the on-going construction around the stations; we can anticipate further price growth once construction is complete and the line opens.
- 4.12 It is also interesting to consider the impact on Treasury savings in terms of capital receipts from stamp duty. Admittedly, the methodology for this is somewhat rudimentary.
- 4.13 As previously quoted, the average house price in SW3 is currently £2.35 million (Zed Index, 2015). In the 12 month period up to September 2015, 295 properties were sold. Using these figures, an average stamp duty receipt of £196,312 per unit would have been generated. This equates to nearly £58m. Applying the uplift of 13% calculated by Knight Frank, the anticipated increase in value results in roughly an additional £7.5 million p/a being generated as a direct result of Crossrail 2. If calculated over 40 years, the additional stamp duty receipt would represent £300 million at present value.
- 4.14 In addition to this, the 3464 new build homes discussed in paragraphs 4.5 and 4.6 would generate more than £421m in stamp duty. When combined with the figure above, this receipt alone represents more than 70 per cent of the cost of the station.
- 4.15 Added to this is the receipt that would be generated from National Insurance and income tax arising from a percentage of the additional new households and jobs that would be created as a result of the station and line and might be lost to London if this development did not take place. As referenced in paragraph 3.3, the average salary in Chelsea is more than £110,000, meaning on average, £33,400 p/a of income tax is owed, with a further £5,500 p/a in National Insurance. If we assume just 10 percent of new residents would not be living in London without this development, this figure equates to more than £11.5 million in tax gains per year and nearly £2 million in National Insurance. However, as this methodology is relatively untested, this figure has not been included in schedule of benefits but if refined and perfected, should be assessed in Transport for London's next iteration of economic analysis for the King's Road station.

Journey time savings

- 4.16 It is anticipated, that the average journey time for those living near the King's Road station and working in the City or Canary Wharf will come down from around 45 minutes to about 20 minutes.
- 4.17 Using TfL's projected morning peak access at the station of 2,000 passengers together with their value of time: £11.57 p/hour, the average annual figure generated by each passenger would be nearly £3,000 (including outward and inward journeys). If calculated over 60 years, cost benefit saving of the station as a whole, equates to more than £275m.
- 4.18 However, this does not allow for the higher than average value of time for professions of our residents as indicated in paragraph 3.3. Within the Royal Borough, the median average earnings of residents are around 50 per cent higher than the London average (London Datastore, 2015). If this increase is applied, the 60 year cost benefit saving is more than £400m.

Business Rates

- 4.19 Whilst residential values make the economic impact on Chelsea so significant, the King's Road also has a distinctly commercial character that will add to these benefits. At present, the stretch of King's Road roughly 800m either side of the station generates £20 million per annum in business rates.
- 4.20 Unlike residential values where Crossrail 1 acts as a direct comparator, finding a retail centre of the same nature as King's Road is not possible, so speculating on magnitude of this increase would be unwise. However, it is logical to assume that rates will increase as footfall associated with the station, and consequently business profitability increases.

5. Summary

- 5.1 It is clear that the cost of the station is a significant outlay. However, positive contributions can also be made. In total, this paper has noted that around **£7.1 billion of additional economic value** (see table of benefits below) could be generated by the station through a modest increase in residential density and journey time savings; both the former and the rise in value of the existing stock of housing would generate tax receipts.
- 5.2 It should also be noted that the benefits to the Exchequer do not include the significant amounts of indirect value which could come forward from welfare savings and tax revenues.
- 5.3 More qualitative impacts on securing the success of the Chelsea Medical Quarter, and the scale of improved business rates, have not been analysed but would be expected to contribute further to the positive business case for a station.
- 5.4 Chelsea's performance as an area of desirable homes for some of London's most productive people is vital too. The better the residential offer, the more London can continue to success on a global scale.

Table of benefits

	Benefit (£billion)	Direct Exchequer Benefit (£billion)	Combined benefits (£billion)
Additional development	5.946		
Journey time savings	.400		
Stamp duty		.721	
TOTAL (Net Present Value)	6.346	.721	£7.1 billion



London Borough of Hammersmith & Fulham | The Royal Borough of Kensington and Chelsea | Westminster City Council

TRI-BOROUGH WHOLE PLACE COMMUNITY BUDGET

INFRASTRUCTURE – AN INTEGRATED APPROACH

Securing Regeneration and
Wider Economic Benefits from
Major Railway Infrastructure Projects

October 2012



INFRASTRUCTURE – AN INTEGRATED APPROACH

Securing Regeneration and Wider Economic Benefits from Major Railway Infrastructure Projects

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Executive Summary

The problem

Railway infrastructure projects are currently designed and planned as ‘silos’, purely to deliver railway schemes. This approach stifles the additional wider benefits such schemes could otherwise deliver through real estate development, economic regeneration, inter-modal connectivity, etc. and provides very little opportunity to understand the rationale behind the decision making process, and even less scope for those outside the silo to influence decisions. Timetables are set on this basis, and then modifications to take a more holistic view are regarded as ‘costs’ as they risk ‘delays’.

Why does this matter?

This report uses the example of High Speed Rail 2 (“HS2”) and Crossrail to demonstrate how a different approach, based on optimisation through a process of partnership working and integrated assessment, could deliver significant economic benefits. Our initial findings are that – if the railway design were optimised to facilitate development – then development at Old Oak Common and a Crossrail station at Kensal for Portobello could potentially yield approximately 21,000 new homes and 196,000 new jobs, with a gross value of approximately £17 billion¹ based on current land values. The additional development at Old Oak Common and Kensal would release substantial economic value, with local Gross Value Added of up to £74 billion in net present value terms (for Old Oak Common alone up to £2.3 billion would accrue to HM Treasury in the form of additional taxes). If these benefits are realised, and reflected in the appraisal of High Speed 2, then it would significantly strengthen the economic case for the project². If developed fully the Old Oak Common site alone could accommodate up to twenty-five per cent of London’s growth over the next thirty years and much of this site is in public ownership (BRBR, TfL and DfT). Kensal / Portobello could be developed from 2018, with parts of the North Pole Depot available immediately.

Options for addressing the problem

Maximising the economic value of railway projects requires Government to work with local partners in a different way. The railway infrastructure and associated development and regeneration will only be optimised where the development and regeneration potential are integrated into the options and analysis from the outset, and co-designed with those partners who are best able to identify those options. In the case of the HS2 and Crossrail projects, that means working with the local authorities to ensure that the configuration of the stations and depots at Old Oak Common and Kensal support the development and

¹ Source: H&F estimate. This figure will be verified shortly through additional economic impact assessment work

² We estimate that a £2.5 billion improvement in the net benefits of HS2 would improve the benefit: cost ratio (BCR) of that project by approximately 0.1

regeneration potential of west London. Formal consultations, such as the current consultation on safeguarding the route between London and the West Midlands, have a role to play, and boroughs will of course engage with such processes. But they are not a substitute for working in partnership from the outset of project development.

There is still an opportunity to ensure that development and regeneration opportunities are realised. The necessary changes can be made to the proposed configuration of the infrastructure. Those changes have the best chance of being optimised and implemented if the following conditions are met:

- The remit of HS2 should be broadened to include engagement with the local authorities along the route to ensure that investment in HS2 is planned to enable these areas to benefit from development opportunities around proposed stations and to deliver wider economic growth;
- The Royal Borough of Kensington and Chelsea should be invited onto the HS2 London / Heathrow Stakeholder Group;
- The assessment methodology for the project should be revised to include consideration of the regeneration benefits that the project will deliver;
- Government and Crossrail should acknowledge the wider economic benefits that a Crossrail station at Kensal /Portobello would deliver and plan the station into its future modelling of the business case and train timetabling;
- The Strategy Board of the Old Oak Common Opportunity Area Planning Framework should have a broader remit and should include Department for Transport at a suitable level of seniority (e.g. a member of the Ministerial team);
- Opportunities should be investigated for finance that can be mobilised by the development potential associated with the projects, e.g. Tax Increment Financing, Community Infrastructure Levy and/or section 106 planning obligations.

The approach advocated in this paper may be replicable elsewhere and should thereby help to ensure that the UK can secure maximum value from the programmes and projects within the Government's national infrastructure plan. Maximising the opportunities for regeneration and development on the back of major infrastructure projects needs to be a cross-government responsibility, and it is recommended that the Department for Communities and Local Government should review how it can contribute to this agenda most effectively.

1. Purpose of the Report

- 1.1 Railway infrastructure projects are currently designed and planned as ‘silos’, purely to deliver railway schemes. This approach stifles the additional wider benefits such schemes could otherwise deliver through real estate development, economic regeneration, inter-modal connectivity, etc. and provides very little opportunity to understand the rationale behind the decision making process, and even less scope for those outside the silo to influence decisions.
- 1.2 This report uses the example of High Speed Rail 2 (“HS2”) and Crossrail to demonstrate how a different approach, based on optimisation through a process of partnership working and integrated assessment, could deliver significant economic benefits. Our initial findings are that – if the railway design were optimised to facilitate development – then development at Old Oak Common and a Crossrail station at Kensal for Portobello could potentially yield approximately 21,000 new homes and 196,000 new jobs, with a gross value of approximately £17 billion³ based on current land values. The additional development at Old Oak Common and Kensal would release substantial economic value, with local Gross Value Added of up to £74 billion in net present value terms (for Old Oak Common alone up £2.3 billion would accrue to HM Treasury in the form of additional taxes). If these benefits are realised, and reflected in the appraisal of High Speed 2, then it would significantly strengthen the economic case for the project⁴. If developed fully the Old Oak Common site alone could accommodate up to twenty-five per cent of London’s growth over the next thirty years and much of this site is in public ownership (BRBR, TfL and DfT).
- 1.3 The approach advocated in this paper may be replicable elsewhere and should thereby help to ensure that the UK can secure maximum value from the programmes and projects within the Government’s national infrastructure plan.
- 1.4 This paper has been prepared by officers⁵ from the London Borough of Hammersmith and Fulham (LBHF), the Royal Borough of Kensington and Chelsea (RBKC) and Westminster City Council, during the course of preparing the tri-borough’s community budget submission to Government in October 2012.

³ Source: H&F estimate. This figure will be verified shortly through additional economic impact assessment work

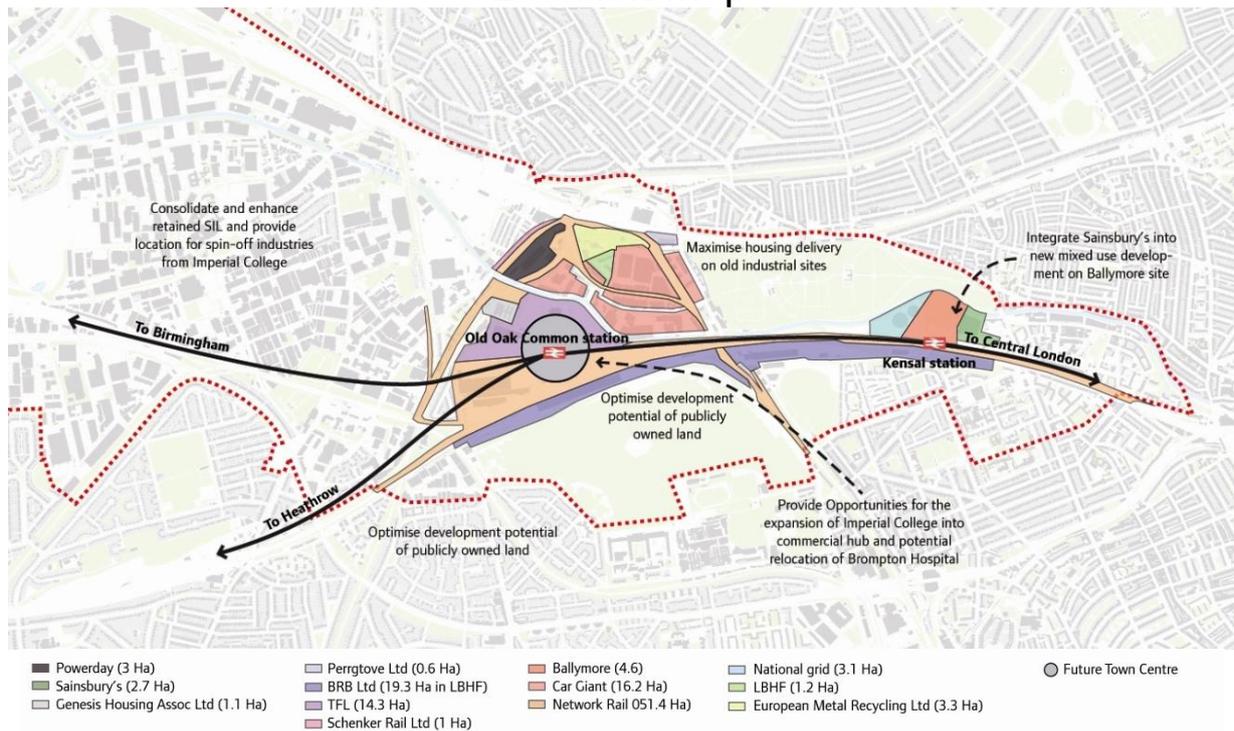
⁴ We estimate that a £2.5 billion improvement in the net benefits of HS2 would improve the benefit: cost ratio (BCR) of that project by approximately 0.1

⁵ See Appendix B for a list of contributors to the report.

2. Current Proposals

2.1 The map below shows the location of the proposed HS2 and Crossrail Stations at Old Oak Common and Kensal and adjacent land ownerships.

Location map



HS2 Old Oak Common Interchange

2.2 As part of the High Speed 2 rail link from Birmingham to London, a new station will be built at Old Oak Common in the north west of London. Old Oak Common could become a new transport super hub for London linking to Birmingham (38mins), Heathrow (11mins), central London (15mins) and potentially to Watford and Milton Keynes. The journey time to Birmingham would be shorter than to Gatwick, making a second runway at Birmingham a realistic alternative or addition to further development of Gatwick, Heathrow or a new London airport. This level of connectivity will transform the surrounding areas, which are currently quite inaccessible, but this impact is not considered in HS2 / Crossrail station design or the government's investment decisions.

2.3 The current HS2 Ltd remit is to deliver the proposals as set out by the Department for Transport in January 2012. This includes the following:

- Old Oak Common will provide an interchange between HS2 and Crossrail services;
- A 14 platform station is envisaged at Old Oak Common, with 6 platforms for HS2 services and 8 platforms for Crossrail/Great Western Main Line (GWML) services.

2.4 On construction and operational cost grounds the station at Old Oak Common is currently being planned as a sunken, open-box station without enabling any associated development. Indeed, without an integrated approach, such a scheme might frustrate or blight future commercial investment and development.

2.5 At the time of finalising this report, DfT has just launched a consultation on safeguarding the HS2 Phase 1 route. We will seek early engagement with HS2 on the safeguarding lines, particularly in relation to construction sites and their potential implications for early development. It is important that the Safeguarding Direction does not preclude upcoming planning applications in the HS2 Old Oak station area that relate to the regeneration of the area and integration of HS2 with the local community.

Kensal (Portobello) Crossrail Station

2.6 In order that a Crossrail station could be installed at a future date, Parliamentary assurance was given to RBKC to provide clear tracks - so called 'plain lining' - when the Crossrail Act went through parliament. RBKC is working with the Crossrail sponsors to establish a Crossrail Station at Kensal for Portobello. It is hoped that, once further modelling on both the business case and train timetabling has been completed (envisaged by Spring 2013), and discussions regarding financial undertakings of the Council have been resolved, the station will be included in the Crossrail construction programme, to open as part of the overall Crossrail project in 2019. Work completed to date suggests that a rail link is the only direct way of connecting Kensal to Old Oak Common. This will also be vital to bring forward the first phases around Old Oak Common before that station opens.

Crossrail Depots Old Oak Common

2.7 Alongside the proposed HS2/Crossrail interchange station at Old Oak Common, there are proposals within the current Crossrail Act to provide a stabling depot and maintenance depot on land to the north of the station covering an area of approximately 13.7 hectares of land.

North Pole Depot

2.8 North Pole Depot runs from Ladbroke Grove in RBKC to Old Oak Common Lane in LBHF, running to the south of the West Coast Main Line. The depot had previously been used in association with

Eurostar. The site is owned by the Department for Transport, currently held by the British Rail Board (Residuary) Ltd (BRBR) which is shortly to be disbanded. The western part of the depot has been leased for a depot to 2038, as part of the Intercity Express Programme (IEP), related to the electrification of the Great Western Mainline (GWML). Most of the land to the east of Scrubs Lane, however, has been provisionally earmarked for development by BRBR. However, it is now likely some of the site might be required for depot facilities displaced by the HS2 project.

3. Issues with the Current Approach and Missed Opportunities

HS2 Old Oak Common Interchange

- 3.1 In functional terms the station will primarily act as an interchange enabling High Speed 2 passengers to transfer on to Crossrail and Great Western Main Line, reducing pressure on the HighSpeed Terminus of Euston.
- 3.2 The location of the new station, although at the junction and confluence of a number of major railway lines, currently has no national rail station on the site. The site is located at the centre of the Park Royal/Willesden Junction Opportunity Area identified in the London Plan, and adjacent to Kensal Canalside Opportunity Area. The wider area is predominantly industrial but it is also home to a number of residential communities as well as natural assets including Wormwood Scrubs and the Grand Union canal. The opportunity area has the potential for major mixed use development and it is important that the new High Speed 2 station plays a role in this regeneration.
- 3.3 It would be possible to design a station that focuses almost entirely on interchange passengers with no interaction with the surrounding area. However this would be a colossal failing in forward planning and would mean that a once in a lifetime opportunity to regenerate this area would be missed.
- 3.4 It is for this reason that the GLA, Transport for London and the surrounding local authorities - Hammersmith & Fulham, Royal Borough of Kensington & Chelsea, Brent and Ealing have started the production of an Opportunity Area Planning Framework (OAPF) for the area, which looks at the potential for regeneration around the new Old Oak Common station.
- 3.5 As part of this work, the authorities have set out three overarching principles for the station design:
 - To support the major development of the surrounding Opportunity Area;
 - To create a strategic transport interchange for west London as set out in the Mayor's Transport Strategy; and
 - To relieve pressure at Euston.
- 3.6 The authorities feel that in order to satisfy the above objectives, HS2's station remit would need to be changed so that:
 - The station is designed to allow for over station development;

- The station is designed with entrances that fit with the emerging plans for the Opportunity Area; and
- The station design allows for the re-routing of the North London Line and West London Line to a new station sitting between the HS2 station and the Crossrail/GWML station.

3.7 The initial findings of the work on the OAPF indicate that if the station were to be designed to take over station development, there would be capacity for up to 800 homes and 14,300 jobs, releasing a minimum of £1.9 billion⁶ gross value based on current land values. Furthermore, development in the vicinity of Old Oak Common Station could potentially yield approximately 19,000 new homes and 190,000 new jobs in 4.6 million square metres of floor space with a gross value of approximately £15.1 billion based on current land values⁷.

3.8 Under the current proposals, transport modelling has estimated that 30% of travellers into London on the High Speed 2 line will stop at Old Oak Common, with the remaining 70% travelling on to Euston. The inclusion of the potential for a North London Line/West London Line connection has been estimated to alter this dispersal split so that 40% of passengers would disembark at Old Oak Common, with only 60% therefore travelling on to Euston. This would have profoundly positive impacts on the ability of the London Underground system at Euston being able to cope with passenger numbers. The proposed connection would also drastically reduce travel times for residents and businesses in western, southern and eastern London to Heathrow and to the new High Speed 2 line.

Crossrail Kensal Portobello station

3.9 This significant development site, consisting largely of the existing and former gas works, was allocated as a strategic development site in the RBKC Core Strategy (adopted 2010). RBKC has prepared an issues and options paper as a first step for the preparation of a Supplementary Planning Document or Local Plan for the site, which offers three broad options, ranging from 2,000 – 3,500 new homes and up to 2,000 jobs⁸, depending on the provision of a station (see above). This shows how a station would stimulate significantly increased regeneration benefits for the area than could be achieved by the development of the adjacent sites without a station. The site comprises:

- Sainsbury's and Ballymore's landholdings to the north of the railway, fronting Ladbrooke Grove and in part the canal. There is an existing Sainsbury's supermarket that would be reprovided as part of the redevelopment. Crossrail have required, via a Transport and Works Act Order, the use of Ballymore's land (which currently has no permanent use) for construction of Crossrail and are

⁶ Source: H&F estimate this figure will be verified shortly through additional economic impact assessment work

⁷ Source: as above

⁸ Source: RBKC Kensal SPD Issues and Options

resisting pressure to provide an end date for this requirement. This uncertainty is delaying the development of these sites.

- National Grid, with two gas holders which are programmed for decommissioning and ancillary equipment and housing. National Grid have recently announced decommissioning dates for all of their gas holders in London. The date for mothballing the Kensal holders has just been confirmed as November 2012, but the date for decommissioning remains to be confirmed. Consequently 1.7 ha of the site remains subject to the Health and Safety Executive's Consultation Zone requirements and cannot be developed. The landowners have long argued (with the support of the Council) that these requirements, and indeed, the arcane process of responding to proposals, require updating. However, opportunities to debate these matters have been very difficult to secure.
- Part of North Pole Depot, to the east of Scrubs Lane (the remainder of the depot is dealt with separately in this paper - see below). Crossrail have recently begun to acquire part of the North Pole Depot near the entrance to the site for a maintenance depot, which is being relocated from Old Oak Common. This is not good economic use of the land which could have a site value of as much as £53⁹m if used for residential and commercial, with a development capacity of around 850¹⁰ homes. Crucially redevelopment of the eastern end of North Pole Depot is an integral part of the regeneration of Kensal, as it will allow for a bridge over the railway line, providing access from the surrounding housing to the proposed Kensal Crossrail station, and better integration of the development sites to the north into the surrounding area. Whilst the land take is only 1,500 sqm its location at the gateway to the site will adversely affect the desirability and financial uplift of this publicly owned land. Despite requests from RBKC and BRBR, Crossrail have rejected this argument and refused to investigate alternative locations, stating that the needs of the network outweigh all other concerns.

3.10 Work by Regeneris, an economics consultancy firm, has shown that compared to other Crossrail stations, the Kensal for Portobello station represents a significant regeneration opportunity, being the 5th most deprived location for a new station. A Crossrail station at Kensal could deliver in the region of £690m additional economic benefits for the wider community, without additional call on the public expense¹¹. The Royal Borough has agreed to underwrite the £33million cost of the station, although the intention is that this will ultimately be met through developer contributions. All that is required is commitment to include a station at Kensal as part of the Crossrail programme. Recent work by GVA has identified that the uplift in property values as a result of having a Crossrail station is in the region of 20 per cent. RBKC are seeking to confirm what the uplift for Kensal/ Portobello would be¹².

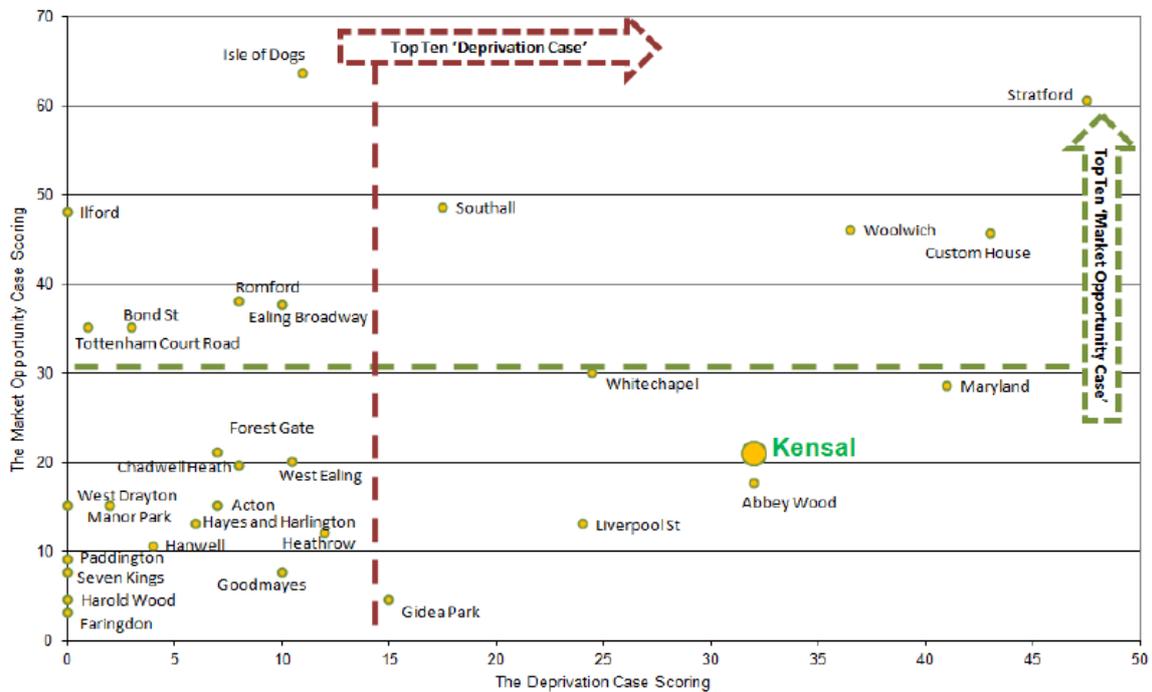
⁹ Source: Knight Frank August 2011 (unpublished report)

¹⁰ Source: Urban Initiatives North Pole Depot Masterplan 2011 (unpublished)

¹¹ See http://www.rbkc.gov.uk/pdf/crossrail_note_on_results2.pdf for further detail.

¹² GVA Crossrail Property Impact Study 2012

Crossrail regeneration benefits



Crossrail Depots Old Oak Common

3.11 The Old Oak Common Economic Impact Assessment has identified that the Crossrail stabling depot and maintenance depot sites, if developed, have the potential to provide 4,500 homes and 9,500 jobs, or approximately 685,000sqm of floor space generating approximately £11 billion¹³ of gross added value, based on current values in the area. The Crossrail land also sits between the station and what is considered to be one of the biggest areas of development potential in the vicinity of the HS2 station to the north of the canal. The inclusion of the Crossrail stabling and maintenance depots within any development scheme is therefore integral in order to make a viable place.

3.12 The authorities acknowledge that there are problems with altering the plans set out in the Crossrail Act, but believe that were plans for the HS2/Crossrail station to proceed, the HS2 Bill would provide a mechanism to relocate the Crossrail stabling and maintenance depot and realise the development potential that the site could deliver and the potential for this to strengthen the business case for HS2. The probable expansion of Crossrail to Reading and the electrification of the GWML provide other options for reviewing depot allocation and the current proposals for terminating 14 trains per hour at Westbourne Park looks like a poor return on the investment in Crossrail when other options for improved services are possible utilising new rolling stock and electrified routes.

¹³ Source: H&F estimate this figure will be verified shortly through additional economic impact assessment work

North Pole Depot Hammersmith and Fulham

3.13 The western part of North Pole Depot will be used as a new IEP Depot and will have a lease until at least 2038. Through discussions with the Department for Transport it has become apparent that this is fixed and there will be no opportunities for the release of this part of the depot site for development opportunities in association with the new HS2/Crossrail station. This is regrettable. Work on the OAPF has shown that this site has the potential to deliver up to 2,000 homes and 4,150 jobs or approximately 250,000 sqm of development with a gross development value of almost £2 billion¹⁴. The authorities believe that, were the HS2 scheme to proceed, consideration should be given to finding an alternative site for the IEP depot in order that the development potential of this section of the North Pole Depot can be realised.

3.14 More generally, the North Pole Depot site also provides the potential for an east-west connection between Old Oak Common Lane, Scrubs Lane and Ladbroke Grove, which could potentially have a huge impact on increasing accessibility to the new High Speed 2 station, as well as relieving pressure on the surrounding road network, particularly at Harlesden which is currently afflicted with severe traffic congestion.

Summary – the extent of the opportunity

	Homes	Jobs	Gross Development Value (homes plus non-residential)	Gross Value Added
Kensal with a Crossrail station 2014 – 2030	2,500	2,000	£1 bn	£700m ¹⁵
Old Oak Common				£73bn ¹⁶
- Over station	800	14,300	£1.9bn	
- Around station	17,500	180,000	£14.1bn	
Total	20,800	196,300	£17 bn	£74bn

¹⁴ Source: H&F estimate this figure will be verified shortly through additional economic impact assessment work

¹⁵ Economic Impact Assessment of Crossrail: Kensal addendum

¹⁶ Old Oak Common Economic Impact Assessment

4. New Approach

- 4.1 This paper calls for a new approach, under which the Mayor, Network Rail, DfT and HS2 would work together to deliver these rail infrastructure schemes in a way that maximises wider regeneration benefits and integrates with emerging Opportunity Area Planning Frameworks for Old Oak Common and Park Royal. That means not only looking at **what** will be built, but also the optimum **sequencing**, since this will affect when land values can be liberated. Together, these parties would investigate:
- The potential for Old Oak to become a major transport interchange for London, including links to existing and new transport infrastructure in the vicinity (with economic benefits estimated at £73billion);
 - How the station design can support major regeneration of the surrounding area and how this regeneration can support the economic case for HS2;
 - The case for a Crossrail station being opened at Kensal / Portobello at the time Crossrail starts operating (with economic benefits estimated at £700 million), together with the opportunity to bring forward the first phases of development around Old Oak Common before that station opens.
- 4.2 Governance will be crucial. This project is about bringing the expertise of relevant parties to the table to co-design value-adding approaches. At the same time, the arrangements must avoid the risk of confusing responsibilities for the delivery of a complex railway project to time and budget.

HS2 Governance

- 4.3 The remit of HS2 was set out in January 2012¹⁷ and is being revised in November 2012. The remit also includes a commitment to provide a document detailing sponsors' requirements early in 2012 but it is not clear if this has materialised. In summary the remit covers:
- Delivery of a safe and affordable route design;
 - Assessment of the environmental impacts of this design and production of the Environmental statement;
 - Consultation with all relevant bodies on aspects of the proposals;
 - Continue current work on developing routes from the West Midlands to Leeds, with a connection to the West Coast Main Line, and a spur to Heathrow, to include appropriate engineering designs and sustainability appraisal and the implications for the whole Y network;

¹⁷ See <http://www.hs2.org.uk/publications/HS2-Ltds-remit-of-11-January-2012-79709>

- Prepare materials and provide advice to develop and inform informal consultations necessary to develop proposals for High speed rail;
- Undertake strategic work on the longer options for serving Scotland and the North East;
- Continue to advise DfT on costs, transport benefits and commercial issues so that the business case for the London to West Midlands phase of the whole Y-shaped network can be updated and costs controlled.

4.4 We would recommend that this remit be amended to include:

- Engage with the local authorities along the route to ensure that investment in HS2 is planned to enable these areas to benefit from development opportunities around proposed stations and to deliver wider economic growth.

4.5 The HS2 London / Heathrow Stakeholder Group is:

- London Councils
- London Borough of Hammersmith & Fulham
- London Borough of Camden
- London Borough of Hounslow
- London Borough of Ealing
- London Borough of Hillingdon
- Slough Borough Council
- Westminster City Council
- Greater London Authority
- South East England Development Agency
- London Chamber of Commerce and Industry
- Thames Valley Economic Partnership
- London First
- CH2M Hill
- Network Rail
- Transport for London, London Rail
- Crossrail
- BAA

4.6 RBKC is not currently a member of the HS2 London/ Heathrow Stakeholder Group although connection into Old Oak Common and the development of Kensal are key issues for the borough. RBKC ought to be invited onto that group.

The Economic case for HS2

4.7 The wider economic impacts of HS2 are currently assessed in terms of impacts on:

- agglomeration - improvements in urban transport networks, to local rail services and road congestion relief as a result of released capacity;
- imperfect competition - increased output as a result of reduced transport costs;
- labour market impacts – reducing time and cost of travelling.

4.8 We would recommend that the assessment methodology is revised to include consideration of the regeneration benefits that the project will deliver. By bringing the boroughs into the process of project governance and co-design, greater confidence can be gained that the regeneration benefits will be realised, thereby improving the robustness of the project economics.

Crossrail

4.9 Government / Crossrail should acknowledge the wider economic benefits that a Crossrail station at Kensal for Portobello would deliver and therefore plan the station into future modelling on both the business case and train timetabling.

OAPF Governance

4.10 Details of the OAPF Governance structure can be seen in Appendix A. The main problem presented by this structure is that it is designed to meet the technical requirements of delivering a project of this kind. The Strategy Board is made up of the GLA Deputy Mayor, Leaders (or other representatives) of four boroughs (LBHF, RBKC, Ealing, Brent) and TfL Planning. There is no strategic representation from DfT that could allow consideration of wider national priorities like using investment in major infrastructure projects to deliver economic development.

4.11 The board could have a broader remit which includes all of the infrastructure to be put in place at Old Oak Common / Kensal and to include DfT (e.g. a member of the Ministerial team). Consideration would need to be given to protecting any planning proprieties (e.g. separation from any powers that DCLG Ministers have under the spatial planning processes and, if relevant, any similar considerations under the HS2 hybrid bill process). Potentially, this body could have a life extending beyond the planning process.

Mayoral Development Corporation

4.12 The possibility of a Mayoral Development Corporation (MDC) for Park Royal, Old Oak Common and Kensal Canalside has been mooted. Whilst this may be desirable to bring forward this site in an

integrated manner and deliver benefits to London as a whole, it would not be sufficient to tackle the all the issues identified in this paper. The 'silos' we have identified are within DfT, HSE, Crossrail and HS2 and therefore outside the scope of a MDC.

Funding

4.13 This project has identified instances where additional up front funding could have safeguarded longer term development opportunities. For example, the decision to build the Crossrail stabling and maintenance depots without the necessary piling to support over-development will mean that to develop these sites at a later date, the depots will need to be relocated.

4.14 It is possible that Tax Increment Financing could be used to cover additional costs like these. Alternatively local authorities should have the option to consider underwriting additional costs against future CIL/ s106 receipts, much as RBKC has committed to underwrite the cost of Kensal station (whilst intending that landowners should ultimately fund the station through developer contributions).

Benefits

4.15 To London and the wider economy:

- The plans that emerge are optimised overall in terms of what gets built (and when). With a development befitting a major interchange, Old Oak Common could provide up to a quarter of London's employment growth (London Plan figures) and a major contribution to housing development and therefore housing affordability.
- By maximising the connections of existing overground and underground lines into HS2, the interchange has the potential to divert passengers away from Euston, which will be of benefit to Westminster as well as Camden.
- Through connecting to the North London Line and West London Line, connectivity with London as a whole is further improved, drastically reducing travel times for residents in western, southern and eastern London to Heathrow and to the new HS2 line.
- The new station at Old Oak will transform an area of Hammersmith and Fulham characterised by low density employment uses into one of the best connected areas of London, with the capacity for significant development.
- RBKC, along with Brent and Ealing, abuts the Old Oak Common area and the facility will thus have benefits for its residents. The Crossrail station at Kensal /Portobello can bring significant growth benefits to a very deprived part of RBKC, without the need for public funding.

4.16 To HS2:

- Potential for development benefits arising from the development to contribute towards the cost of infrastructure.
- Potential improvement to BCR
- Participation of the boroughs will help generate buy-in to the proposals.

4.17 To Crossrail:

- Delivery of additional regeneration benefits through serving a neighbourhood which is the fifth most deprived on the Crossrail route with a station at Kensal that would generate £690m additional economic benefits.

4.18 To the GLA/TfL:

- A success for the OAPF process.
- Potential Mayoral Development Corporation.
- Accommodating 25% of London's growth over the next 25 years.

5. Timing

HS2

- 5.1 It is anticipated that the remit for High Speed 2 will be fixed in September/October 2012. It is therefore a matter of urgency that any alteration to HS2's remit is agreed and implemented as soon as possible.
- 5.2 As part of the OAPF work, the authorities have commissioned a study looking in greater detail at the economic benefits that can be achieved through development around the HS2 station. This study focuses on value uplift and the sequencing of infrastructure delivery and development sites in order to realise the greatest value from development. Further work is being commissioned on the net value of development and extrapolating its impact on London which can be used to strengthen the business case for HS2. It is anticipated this work will be concluded by the end of 2012.
- 5.3 The authorities are working with Transport for London on the case for connecting the HS2/Crossrail station at Old Oak Common to the North London Line and West London Line. The initial work has been shared with the Department for Transport.
- 5.4 The authorities are in the process of producing plans for the design of the HS2/Crossrail station. These plans will show how the authorities envisage that the station could be designed so that it maximises the station's impact on the regeneration of the surrounding area, through its contribution to a sense of place and through the creation of a welcoming public realm within and outside of the station.

Crossrail Depots

- 5.5 Crossrail are currently in the process of appointing a development partner to deliver the Crossrail depot sites. It is important that any solution is designed to allow for the potential release of these sites for development at a future date.
- 5.6 The economic benefits study identified the benefits of the inclusion of the Crossrail depots within a comprehensive approach to the regeneration of the Old Oak Common area as £700 million.

Kensal / Portobello Crossrail Station

- 5.7 In order to ensure that the station at Kensal can be inserted into the Crossrail programme without causing delays, a decision on a station at Kensal is required before the end of 2013. Prior to that date discussions surrounding the businesses case and timetable modelling need to have been concluded.

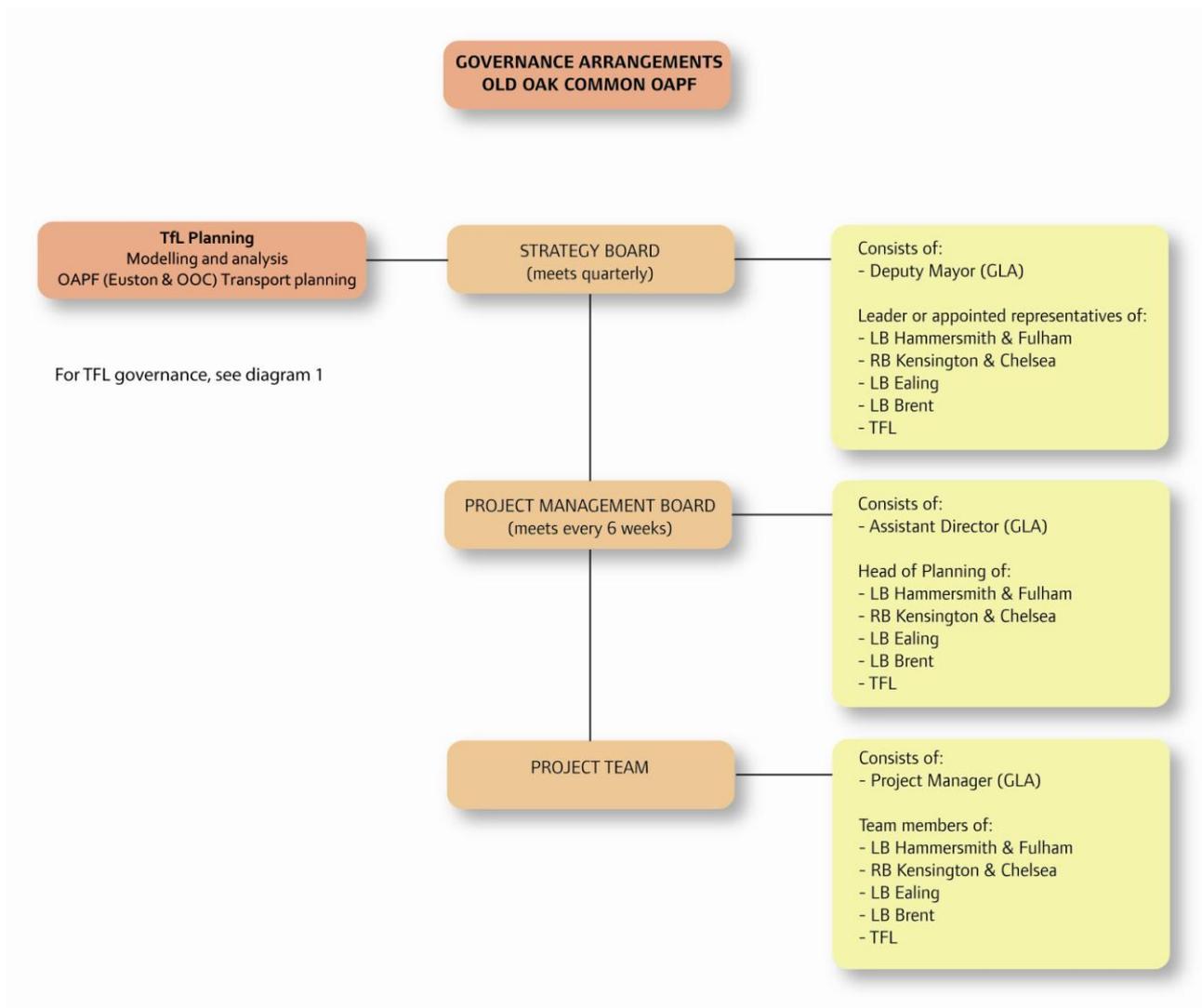
North Pole Depots

- 5.8 The economic benefits study identified the benefits of inclusion of the western part of the North Pole Depot to be used by electric trains to 2038 within a comprehensive approach to the regeneration of the Old Oak Common area as £200 million
- 5.9 The depot use is ill-conceived and whilst it may represent an optimum railway solution, it is important that the wider benefits of using the site differently. Early confirmation that the eastern part of North Pole Depot will be released for development (rather than be used for a depot) would significantly aid the project, as it is integral to ensuring the main sites can be connected effectively into the surrounding urban area.

6. Replicability

- 6.1 Many of the processes that are involved in major transport infrastructure projects are similar, so the ideas presented in this paper can have broader application, although this would need to be tailored to the specific circumstances. The particular lessons that can be learned by taking a different approach to this project, which could be adopted elsewhere are:
- Focussing from the outset on integrating the transport project with the wider benefits that can be realised;
 - Involving local partners in the design and governance of the project, in a way that generates buy-in, maximises benefits, allows local partners to make a contribution to the success of the project but without blurring accountabilities for delivery;
 - Ensuring that where decisions are made that prevent development, now or in the future, the value of the lost development is identified and acknowledged in the cost benefit assessment, and conversely ensuring that regeneration benefits that are delivered are included as benefits;
 - Allowing Local Authorities to be part of the design decision making process so that they have the option to consider calling upon alternative funding mechanisms like s106, CIL or Tax Increment Financing in order to deliver wider economic benefits from infrastructure investment.
- 6.2 Whilst the Department for Transport is the lead department for major transport infrastructure projects, maximising the opportunities for regeneration and development on the back of such projects needs to be a cross-government responsibility. In particular, the Department for Communities and Local Government would have a strong interest in ensuring that regeneration and development are factored in at the earliest stages of project development, and it is recommended that DCLG review how it can contribute to this agenda most effectively.

Appendix A: Opportunity Area Planning Framework Governance



Appendix B: Contributors to the Report

This report has been written with contributions from:

London Borough of Hammersmith & Fulham

- Chris Bainbridge, Head of Transport Planning
- Thomas Cardis, Policy & Projects Officer
- Gordon Prangnell, Head of Highways and Construction
- Farrah Rossi, Principal Projects Officer

The Royal Borough of Kensington and Chelsea

- Joanna Hammond, Neighbourhood Planning Team Leader
- James Masini, Neighbourhood Planning Officer
- Penelope Tollitt, Head of Policy and Design

Westminster City Council

- Graham King, Head of Strategic Planning & Transportation
- Barry Smith, Operational Director

Tri-borough Whole Place Community Budget Team

- Mark Davis, Theme Lead (Economic Opportunity)



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Royal Borough of Kingston upon Thames
Response on National Infrastructure Commission Call for Evidence
London's Transport Infrastructure

The Royal Borough of Kingston upon Thames welcomes the creation of the National Infrastructure Commission and its objective of providing independent advice to government on long term investment choices. We are pleased to provide comment on the following questions relating to London's transport infrastructure.

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

The predictions for population growth and associated requirement for jobs represents one of the major challenges facing London. Working with partners, this Council is striving to deliver against London Plan targets with ambitions for sustainable growth within the borough, and notably in and around a number of well connected key locations in the Borough. The Council is proactively engaging to shape growth to encourage high quality, innovative development of exemplar design and sensitively integrated within its surroundings.

However, there is an overriding need to balance housing provision with the location of new jobs to create balanced and sustainable communities. Population growth in our area needs to be matched by significant local growth in employment, otherwise most new job opportunities will be concentrated in central London and create even greater pressure on our already constrained radial transport routes. Appropriate mixed use development is key to achieving successful redevelopment and intensification, particularly in central locations. Metropolitan centres such as Kingston need to become a focal point for new jobs and transport oriented development, helping reduce the need for radial trips to central London. Investment in high capacity orbital links are therefore needed to kick-start both housing and employment growth more evenly across the region. This is particularly important accounting for the fact that the South London Sub Region has the lowest connectivity of any sub-region which is a principal constraining factor on our economic growth.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

Kingston strongly supports the Crossrail 2 initiative which is desperately needed to address severe capacity constraints in the public transport network and also support the growth in housing and jobs which is predicted across the area in the coming years. Crossrail 2 will help address some of the key imbalances that exist in Kingston, in particular its poor connectivity by rail and lack of tube/tram connections and over reliance on the bus, which are all evident despite its status as a Metropolitan Centre. Importantly, it would facilitate the creation of new investment markets (for employment and residential use) above and beyond the scale of which could be delivered without Crossrail 2, for example at Tolworth.

Crossrail 2 would transform travel to and from the area providing direct train services to destinations across the region with increased capacity for many more people travelling in peak periods, helping relieve crowding and congestion. Enhanced journey times to central London (particularly from the south of the borough) and the provision of step-free access at all stations on the proposed Crossrail 2 route are seen as major steps forward and improvements that many local people have been requesting for some time.

Crossrail 2 will make London's financial and business districts more accessible to Kingston residents, with improved and more frequent services. It will also make Kingston's unique cultural and shopping offering more accessible to the rest of London. Through Crossrail 2, the Council wishes to take the opportunity to explore the potential of remodelled and reconstructed stations in Kingston, Tolworth and New Malden centres to secure better connectivity into the towns.

South London Boroughs would benefit from improved orbital rail links between key centres such as Kingston, Croydon and Wimbledon. This is a matter that boroughs in South West London have been pursuing for many years through various transport forums. There is potential for improvements to orbital travel for all modes, in particular linking key metropolitan centres to areas of housing growth.

Bus operations are of particular importance to Kingston due to the current lack of alternative public transport options. A package of significant bus measures would be of particular benefit in the area to provide more frequent and reliable services and new routes.

In terms of cycling infrastructure, the current mini-Holland initiative, which is being trialled in 3 London boroughs including Kingston, is a major opportunity. The success of these measures will be tested and no doubt the potential for rolling out similar initiatives on a London wide basis will be assessed.

There is also the need to consider interdependencies between investment in numerous areas of infrastructure in terms of delivering optimum levels of development. For example, at Tolworth, while Crossrail 2 is an essential piece of public transport infrastructure which will help facilitate growth in this area of opportunity, there is an associated requirement to improve the A3/A240 road intersection and identify supporting new road arrangements in the area which will help free up space for the required redevelopment. In particular this involves reducing the severance effect that the A3 Trunk Road has on this area.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

RBK strongly supports the increased benefits of the Regional scheme over the Metro scheme. The Regional scheme would bring significant benefits to a many outer London boroughs which would otherwise see little benefit from the alternative Regional scheme. It includes a number of south west branches that would make a real difference enabling sustained growth in our boroughs. We believe that the benefits, both transport and non-transport, will probably be maximised with the current scheme and that any further route extensions or new stations would simply add increasing complexity for marginal benefits. Crossrail 2 will promote new and sustain existing community infrastructure and business growth in outer London to support and create balanced sustainable communities.

The Regional scheme would see significant funding through future growth while the use of existing railway tracks in outer London will certainly contribute significantly to reduced overall scheme costs. Any cost cutting resulting in the loss of branches or stations, capacity or frequencies would undermine the viability of the project and specifically the benefits to our residents and businesses.

The Council is currently working with the Greater London Authority (GLA) and Transport for London (TfL) to produce an Opportunity Area Planning Framework (OAPF) for Kingston with Kingston Town likely to be designated an Opportunity Area in the updated London Plan. Crossrail 2 is a major piece of supporting infrastructure in the facilitation of such growth. Key sites in and around the town centre are being identified for redevelopment including

intensification and potential land use changes. There is also the possibility of a similar approach being adopted for the Tolworth and New Malden areas of the borough with associated supporting studies. In particular, there are potentially a number of significant development sites in Tolworth that could optimise their development potential and an associated change in land use patterns through the provision of a Crossrail 2 station.

Recent economic studies report Kingstons's relatively poor levels of rail connectivity being a major contributory factor in the town having failed to attract significant new office development in recent times. Crossrail 2 provides a significant opportunity to attract investment to secure the employment potential offered by Kingston town centre as well as creating new strategic markets for employment use in Tolworth, New Malden etc.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

Crossrail 1 is being funded through a combination of fares revenue, the Business Rate Supplement and Mayoral Community Infrastructure Levy (CIL). The London wide benefits mean that there is a need to press the Mayor, TfL and government to reflect the Crossrail 1 approach to securing funding from all London Boroughs for Crossrail 2 (and Councils that will see benefits from additional rail capacity, connectivity and economic development). To propose funding is drawn only from the boroughs or developments that directly benefit from the south west to north east routes would be seen as inequitable and as such unacceptable to our communities and businesses.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

We recognise the value of learning from the experience of cities around the world in terms of funding and delivering transport infrastructure in many innovative and effective processes.



National Infrastructure Commission: call for evidence

Royal HaskoningDHV Response

07/01/2016

1.0 Introduction: Setting the context for our response

Royal HaskoningDHV is an independent, international engineering and project management consultancy with more than 130 years of experience. Backed by the expertise and experience of 7,000 colleagues all over the world, our professionals combine global expertise with local knowledge to deliver a multidisciplinary range of consultancy services for the entire living environment from over 130 countries. By showing leadership in sustainable development and innovation, together with our clients, we are working to become part of the solution to a more sustainable society now and into the future.

In the UK, Royal HaskoningDHV's experience encompasses projects in several sectors including ports, flood risk, energy generation, transport, aviation and waste. Our collaborative approach means that our staff work outside, as well as within, sectoral silos and across geographic boundaries, ensuring that we identify opportunities or issues of mutual relevance to our clients and share project solutions from other sectors or countries. We firmly believe that working in partnership across sectors and disciplines delivers successful outcomes that cannot be achieved by those working solely within a sector.

We therefore consider that the sectoral and geographic split of the three initial challenges facing the Commission risks limiting the identification of links between these challenges (and others). The National Infrastructure Commission has a 'once in a generation opportunity' to seek to understand the drivers that shape the characteristics of the regions of the UK and how those drivers and characteristics interrelate. Transport and energy should be the facilitators of this grand vision instead of being pushed into the role of drivers of economic growth.

In our view, a National Infrastructure Commission should present the overarching picture of infrastructure assets and needs built from knowledge of connections, synergies, mutual benefits and the need to respect differences. The Commission should avoid starting with the status quo and considering only infrastructure that has already been identified from within the confines of regional, sectoral or administrative boundaries. Existing knowledge and expertise must be used, but a strategic UK Master Plan should be built in partnership from the ground up – not in sectoral isolation and then measures taken to try and join unconnected aspects together.

We call for an Integrated Master Plan delivering a vision for the country; what do we really want the UK to be? It must be more than the sum of the sector silos.

2.0 The Challenge: Large-scale transport infrastructure improvements in London

Royal HaskoningDHV has been involved with the transport planning of many developments in the Greater London Area for more than 40 years. We always take the position that transport should form an integral part of the evolution of a scheme at an early stage and sometimes leads to new standards. The ultimate goal is the delivery of a development that is accessible, sustainable and resilient.

During the last 5 years our involvement with delivering the Cycling Ambitions of the Mayor of London has grown significantly. We are currently part of the Implementation team for London Quietways and Implementing Quietways and involved with sections of the Super Cycle Highway.

We strive to leverage our global experience for the challenges for London. With projects such as North-South Metro in Amsterdam, Netherlands, Decision Support System for the Traffic Management Centre of Beijing, China, the Rail Investment Program for the Amsterdam Metro Area, Netherlands and the Development Plan for the Diraab Corridor in Riyadh, Saudi Arabia.

In responding to this challenge we have identified a number of underpinning themes and principles and also directly answered Questions 1 and 5.

Underpinning themes:

- **Transit Oriented Development** for the entire UK will be key in delivering a sustainable transport system.
- **Focus and prioritise based on a holistic approach to transport**
 - Do we really want to continue and repeat the transport solutions from the Victorian era? While recognizing their contribution, they are in principle almost 150 years old (on average) with the train 185 years, the car 120 years and underground 153 years.
 - The National Infrastructure Commission questions focus to a great extent on the existing solutions. Is that really how we want to plan and develop the UK for the next 30 years? Do we sufficiently understand the questions?
 - We should focus and prioritise investment for the next 10 years on the key capacity bottlenecks in rail, road and ports.
 - Use the first five years for developing a holistic approach to transport for this country including the technology developments in the pipeline, demographic trends and anticipate its wider impact on how we want transport to be.
 - Set minimum restrictions to allow businesses to develop and implement new technology within the framework.
 - Minimum requirements of the transport system in 2030 should be 100% carbon neutral, fast, reliable and at a human scale.
- **Enable innovative solutions**
 - The National Infrastructure Plan is planning for 20 to 30 years going forward (related to lead times and available capital funding). We must plan in an agile way, to ensure easy adaptation of new technologies.
 - Technology tends to have a life cycle of a just a few years on average compared to 50 to 100 years for structures.
 - The original technology should be compatible with the next version and adaptable to future versions.
 - “We should accept that cities are never finished, everything is always in a beta stage” (quote from: Martijn Aslander and Erwin Witteveen in “Nooit Af” (Never finished) 2014)
- **Strive for multi-functional design**
 - Plan a corridor approach to roads, rail, water and power transport thereby combining funding resources (in other words: ‘de-silo’) and reducing redundancy.
 - Integrated solutions provide increased resilience. A good example for this approach is with flood defence. The floods in the North of England in December 2015 caused significant damage and disruption, including impacts on the transport network. It is self-evident that flood risk and climate resilience have to be taken into account in designing improvements to the transport system. However, there is an opportunity to do more: the new infrastructure itself could be designed to help reduce risk to property and people, and for particularly

vulnerable places the investment could even trigger a redesign of the area for a more climate-proof future. We see this type of multifunctional integrated design as an important part of the solution for the UK's flooding crisis, inspired by the Rebuild by Design approach developed in New York after Super Storm Sandy.

Question 1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

Delivery model

We anticipate an increasing tension as a result of the devolution of the surrounding county councils around London. Travellers and goods want seamless journeys and don't recognise administrative boundaries. With the goal of delivering an optimized transport experience we advocate for more power and influence of the Greater London Assembly. This will ensure an integrated approach, keeping projects on their anticipated delivery dates, while at the same time adhering to good governance standards. If this is not feasible, the National Infrastructure Commission should, as the next stage, be transformed into a delivery organisation and agency as part of the Treasury, which will coordinate infrastructure investments.

Housing – what and where?

We must anticipate and plan for changes in the type and location of housing over the next 30 years. What is the real preference of how people would like to live? If that is suburbia (house, garden, and car on the driveway) it is not sustainable (given the increasing population) when considering the demands for all the different type of services (e.g. water, sewage, transport, health care and more).

With the average age increasing, it is likely that more and more people will want to have relatively easy access to a wide range of services from leisure (cinema, museums, parks), to healthcare, to mobility. To deliver that efficiently people will want to move into the city or urbanised centres. At a minimum the government should not support or subsidise further suburban sprawl of London.

In our view London and its satellite cities should densify and develop on Transit Oriented Development principles only. For this reason we strongly support the GLA in her efforts to densify specific areas in the Central Area of the City such as Paddington.

Question 5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

Example: Hong Kong

Hong Kong is an example of a highly integrated city from a transport and planning perspective.

Its key aspects include:

- The Masterplan & Vision are supported by all stakeholders;
- National and city interests are aligned as a result of the governing structure. Planning, funding and operations are close and taken into account with every decision on investment and operations.
- Image of Public Transport: you have a higher status if you live on top of or within close range of a Metro station



Further information

We would be delighted to engage with the Commission to provide further explanation and to participate in the discussion surrounding the challenges.

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National Infrastructure Commission (NIC) Response from the RSPB to the Call for Evidence

December 2015

[contact redacted]

SUMMARY

The RSPB welcomes the creation of the National Infrastructure Committee (NIC) and the opportunity that this provides to analyse and assess long-term infrastructure needs in a coordinated and strategic way.

Whilst we accept that '*better infrastructure is vital to improve the needs of British people*¹', it is also vital – in order to achieve truly sustainable development – that this infrastructure is delivered in harmony with nature. Taking this approach would not only help to save nature, it would also provide a wide range of social and economic benefits,

Our recommendations are outlined below:

Green infrastructure

The NIC's remit should include consideration of the UK's strategic, long-term green infrastructure requirements as determined by the Natural Capital Committee. Such consideration must be designed to ensure that NIC recommendations complement, not undermine, the Government's 25 year plan to save the UK's biodiversity.

Taking a spatial approach

The NIC should:

- Recommend the creation – and lead on the development – of a 'light-touch', national spatial framework for the provision of key national infrastructure needs over the next 30 years.
- Undertake strategic environmental assessments of the UK's strategic infrastructure requirements.

Connecting northern cities

The NIC should ensure that its:

- Evidence base includes consideration of environmental impacts, particularly in relation to nature conservation designations of national and international importance.
- Recommendations on future investment priorities would result in no significant

¹ Statement from Chancellor George Osborne, launching the National Infrastructure Commission on 30th October 2015. <https://www.gov.uk/government/news/infrastructure-at-heart-of-spending-review-as-chancellor-launches-national-infrastructure-commission>

adverse effects on nature conservation designations of national and international importance.

London's transport infrastructure

The NIC should recommend that:

- The use of clean, excavated material - resulting from improvements to London's transport infrastructure – in habitat creation / flood risk management schemes should be classed as recovery, rather than waste disposal.
- Habitat creation / flood risk management schemes should be a primary option when considering how to dispose of clean, excavated material resulting from improvements to London's transport infrastructure.
- Infrastructure is provided to facilitate the transportation of excavated material – resulting from improvements to London's transport infrastructure - by train and by boat, including the provision of jetty facilities at coastal or riparian destinations.

Energy

The NIC should recommend that the UK's energy infrastructure needs be met in a way that:

- Reduces greenhouse gas emission by at least 80% from 1990 levels by 2050;
- Delivers a low-carbon energy sector by 2030;
- Maximises the use of renewable energy technologies and minimises reliance on fossil fuels;
- Is delivered in harmony with nature, resulting in no significant adverse effects and, where possible, delivering net-gains for biodiversity.

INTRODUCTION

The RSPB welcomes the creation of the National Infrastructure Committee (NIC) and the opportunity that this provides to analyse and assess long-term infrastructure needs in a coordinated and strategic way.

Whilst we accept that '*better infrastructure is vital to improve the needs of British people*², it is also vital – in order to achieve truly sustainable development – that this infrastructure is delivering in harmony with nature. In particular, this infrastructure should be delivered in a way that:

- avoids adverse effects on our existing environmental assets, particularly those of national and international importance;
- delivers a net gain in biodiversity and contributes to establishing coherent and resilient ecological networks;
- contributes to people's health and wellbeing;
- mitigates – and facilitates adaptation to – the impacts of climate change.

Taking this approach would not only help to save nature, it would also provide a wide range of social and economic benefits (as outlined in the section on Green Infrastructure, below).

² Statement from Chancellor George Osborne, launching the National Infrastructure Commission on 30th October 2015. <https://www.gov.uk/government/news/infrastructure-at-heart-of-spending-review-as-chancellor-launches-national-infrastructure-commission>

In some instances, the natural environment can, itself, provide a cost-effective and sustainable alternative to expensive, 'hard' infrastructure, for example, through the managed realignment of coastal flood defences.

We understand that the Chancellor will consult further on the purpose and structure of the Commission and other matters. Our comments on green infrastructure and taking a spatial approach are relevant to the NIC's remit and therefore this further consultation, but are included here as they are fundamental to our view of the NIC's work and our response to the NIC's three key focus areas.

The NIC's terms of reference - and the questions that it poses in its call for evidence - currently give little emphasis to the principles above or to the related issues outlined below. In our recommendations, we identify how the NIC can potentially address these concerns.

GREEN INFRASTRUCTURE

Infrastructure can be defined as '*the fundamental facilities and systems servicing a country, city or area*'³. In the context of the UK's infrastructure needs, this is normally taken to mean the 'hard' infrastructure of physical structures such as roads, bridges, tunnels, water supply and sewerage systems, electricity grids, etc. However, in its broadest sense, it also encompasses what is commonly referred to as 'green' infrastructure – the network of green spaces and other environmental features that are integral to the health and quality of life of sustainable communities. It is based on the principle that protecting and enhancing nature and natural processes, and the many benefits human society gets from nature, should be consciously integrated into spatial and development planning.

This green infrastructure is central to the future of the economy and people's health and wellbeing. For example, it delivers essential 'ecosystem services' (life-support systems), such as capturing and storing carbon, flood protection and water purification. It enables contact with nature and active recreational use of natural green spaces, which contributes to people's psychological well-being and physical health. As such, it plays a crucial role in addressing the country's health crisis, which is being caused by spiralling levels of physical inactivity, obesity and mental health issues. It is also key in shaping the character and quality of the places in which people live and work. Finally, in many instances, it can actually provide a cost-effective and sustainable alternative to expensive, 'hard' infrastructure projects, for example, through the managed realignment of flood defences. The Natural Capital Committee's third report⁴ makes a very strong economic and social case for the importance of elements of green infrastructure – such as green spaces, parks, green roofs, and sustainable drainage systems – to the future success of the country.

The wide range of benefits provided by green infrastructure makes it clear that it should be at the heart of any analysis and assessment of the UK's long-term infrastructure needs, both in the context of providing 'hard' infrastructure and in its own right.

³ <http://dictionary.reference.com/browse/infrastructure>

⁴ <http://nebula.wsimg.com/272833c20f4e7f67e2799595a7f06088?AccessKeyId=68F83A8E994328D64D3D&disposition=0&alloworigin=1>

25 year plan for nature

The Government has committed in its manifesto and subsequent statements to ‘*develop a 25 year plan to restore the UK’s biodiversity*’. This provides an impetus to deliver green infrastructure at a strategic level, contributing to the Government’s international obligations to restore biodiversity.

In 2013, 25 of the UK’s nature conservation and research organisations came together to produce the *State of Nature* report, setting out the state of our wildlife⁵. The key finding of this report was that 60% of the 3,148 species that were assessed have declined in the last 50 years, and 31% have declined strongly. The follow-up report, *Response for Nature*⁶, sets out 10 key actions that the Government must include as part of its 25-year plan to restore the UK’s biodiversity.

The proposed Response for Nature actions are the responsibility of departments across government. Those of most relevance to the NIC are:

- **Set goals for nature and natural capital** - including a commitment to secure the effective management of a sixth of land for nature by 2020.
- **Defend and implement the laws that conserve nature** - including working to improve the implementation of the Birds and Habitats Directives and supporting the introduction of a low-carbon infrastructure plan.
- **Deliver an ecological network on land and at sea** - including creating a national ecological network and completing a spatial analysis of the ecological network.
- **Improve the connection of people to nature** - including a commitment to improve public health locally, by increasing the extent, quality and accessibility of natural green and blue spaces in all urban and rural settlements.

The NIC is not currently set up to deal with issues of green infrastructure. If our recommendation is pursued, consideration needs to be given to securing the relevant expertise from bodies such as Natural England, the Environment Agency and the NGO sector.

Recommendation:

- The NIC’s remit should include consideration of the UK’s strategic, long-term green infrastructure requirements as determined by the Natural Capital Committee. Such consideration must be designed to ensure that NIC recommendations complement, not undermine, the Government’s 25 year plan to save the UK’s biodiversity.

⁵Burns F, Eaton MA, Gregory RD, et al. (2013) *State of Nature report*. The State of Nature Partnership. https://www.rspb.org.uk/Images/stateofnature_tcm9-345839.pdf

⁶ Response for Nature partnership (2015) *Response for Nature: England*. http://www.rspb.org.uk/Images/responsefornature_england_tcm9-407740.pdf

TAKING A SPATIAL APPROACH

The NIC is charged with offering unbiased analysis of the UK's long-term infrastructure needs and with holding government to account for its delivery. It will also be charged with beginning work on a national infrastructure assessment, looking ahead to requirements for the next 30 years.

The delivery of the UK's long-term infrastructure needs will, to a large extent, be spatial in nature (i.e. particular infrastructure will be delivered in particular locations). As such, strategic spatial planning should play a key role in the NIC's analysis and assessment of these infrastructure needs.

Whilst the local plan process can help to identify specific locations for specific local infrastructure improvements, this level of spatial planning is not sufficient to facilitate the delivery of national infrastructure needs. This will be true even where local authorities take a more co-ordinated approach to infrastructure provision, for example, through the devolution of powers to combined authorities. What is needed is a 'light-touch', national spatial framework showing options and proposals for key infrastructure provision over the next 30 years. This framework should complement related plans and strategies, such as the low carbon infrastructure plan proposed in our response on energy infrastructure (see above).

Strategic environmental assessment (SEA) should play a key role in this spatial planning process. SEA can be a particularly useful tool when considering the range of alternative options for future infrastructure provision, including consideration of different technologies and locations.

Strategic spatial planning and SEAs relating to the improvement of existing infrastructure, such as trans-Pennine transport routes, should be relatively straightforward. However, a more innovative approach will be required for other infrastructure issues such as the provision of a low-carbon energy system. The RSPB is currently developing a spatial framework that will identify how this low-carbon energy system can be delivered in harmony with nature. This has the potential to provide an essential tool for the NIC in developing its own spatial plan. The findings and recommendations of this project will be launched in 2016.

Further advice on spatial planning with nature in mind is provided in the RSPB / RTPi publication, *Planning Naturally*⁷.

Recommendations:

The NIC should:

- recommend the creation – and lead on the development – of a 'light-touch', national spatial framework for the provision of key national infrastructure needs over the next 30 years;
- undertake strategic environmental assessment of the UK's strategic infrastructure requirements.

⁷ RSPB (2013) *Planning Naturally: spatial planning with nature in mind in the UK and beyond*. http://www.rspb.org.uk/Images/planningnaturally_tcm9-349413.pdf

CONNECTING NORTHERN CITIES (Call for Evidence) / FUTURE INVESTMENT IN THE NORTH'S TRANSPORT INFRASTRUCTURE (Terms of Reference)

The RSPB does not seek to comment directly on the questions that have been posed in the NIC's call for evidence on the issue of connecting cities in northern England. However, we would like to comment on the NIC's terms of reference for providing advice to government on future investment priorities to improve connectivity between cities in northern England, particularly across the Pennines.

The NIC's terms of reference state that the NIC must first establish the evidence base and identify the options available. This must include evidence of the potential environmental impacts of the various strategic options for future transport investment. This should be addressed as a crucial issue by the NIC, given that several of the proposed trans-Pennine infrastructure improvements cut across sites of international importance for nature conservation (i.e. Special Protection Areas (SPAs) and Special Areas of Conservation (SACs)). Relevant SPAs / SACs - and the infrastructure proposals which could potentially have a significant effect on these designations - are outlined in Annex 1.

Under the Conservation of Habitats and Species Regulations 2010 ('the Habitats Regulations'), if any of these projects may have a 'likely significant effect' on the SPAs / SACs (either individually or in combination with other plans or projects), it must be made subject to an "appropriate assessment" of its implications for the site in view of the site's conservation objectives. This assessment is commonly referred to as a Habitats Regulations Assessment (HRA). **The projects may only proceed if they will not adversely affect the integrity of the site concerned**, unless the so-called 'derogation tests' apply. These include a test that there are no less-damaging alternatives to achieving the objectives of connectivity.

Recommendations:

The NIC should ensure that its:

- Evidence base includes consideration of environmental impacts, particularly in relation to nature conservation designations of national and international importance.
- Recommendations on future investment priorities would result in no significant adverse effects on nature conservation designations of national and international importance.

LONDON'S TRANSPORT INFRASTRUCTURE (Call for Evidence / Terms of Reference)

The RSPB's main interest in the issue of London's transport infrastructure is the use of excavated material deriving from improvements to this infrastructure. Our comments relate to Question 3 and 4 posed by the NIC in its Call for Evidence⁸ and to the NIC's terms of reference on this issue.

Improvements to London's transport infrastructure result in the production millions of tonnes of excavated material that needs to be disposed of each year. Not only is this disposal

⁸ Question 3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?; Question 4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

potentially hugely expensive, but the transportation of this material also provides a significant challenge.

The Wallasea Island Wild Coast project provides an excellent example of how the benefits of such infrastructure improvements can be greatly increased and the costs significantly reduced. In this project, three million tonnes of excavated material from London's Crossrail project has been used to help create 670ha of new, tidal, wetland habitat. See Annex 2 for further details of this project.

One of the key factors that made the use of Crossrail's excavated material financially viable was that the Environment Agency classed this use as 'recovery' – as defined in Article 3(15) of the Waste Framework Directive (Directive 2008/98/EC on waste) - rather than 'waste disposal'. As such, the use of this material is subject to a much less stringent – and, therefore, much cheaper – regulatory regime than would be required for a waste disposal operation. The 'recovery' classification has also resulted in savings of approximately £200 million because landfill tax has not had to be paid for the disposal of this material.

However, the Environment Agency's decision to class the use of this material as 'recovery' has been somewhat controversial. For example, in a recent Court of Appeal case, the Environment Agency's legal representative *'argued that the EA [Environment Agency] itself had erred in law in granting a standard rules environmental permit (i.e. a recovery operations permit) in respect of the use of Crossrail waste spoil for the creation of a nature reserve in the Wallasea decision.'*⁹

Given the issues raised about Wallasea in the Court of Appeal case, it is by no means certain that a recovery permit will be granted for the use of excavated material at Wallasea, or for similar projects, in the future. If the use of this material is classed as 'waste disposal', it could jeopardise the completion of the Wallasea project (which still requires an additional seven million tonnes of material) and the delivery of similar habitat creation / flood risk management projects in the future. Last, but not least, it would also add hundreds of millions of pounds to the cost of improving London's transport infrastructure.

Recommendations:

The NIC should recommend that:

- The use of clean, excavated material - resulting from improvements to London's transport infrastructure – in habitat creation / flood risk management schemes should be classed as recovery, rather than waste disposal.
- Habitat creation / flood risk management schemes should be a primary option when considering how to dispose of clean, excavated material resulting from improvements to London's transport infrastructure.
- Infrastructure is provided to facilitate the transportation of excavated material – resulting from improvements to London's transport infrastructure - by train and by boat, including the provision of jetty facilities at coastal or riparian destinations.

⁹ Tarmac Aggregates Ltd, R (on the application of) v The Secretary of State for Environment, Food and Rural Affairs & Anor [2015] EWCA Civ 1149 <http://www.bailii.org/ew/cases/EWCA/Civ/2015/1149.html>

ELECTICITY INTERCONNECTION AND STORAGE (Call for Evidence) / DELIVERING FUTURE-PROOF ENERGY INFRASTRUCTURE (Terms of Reference)

The RSPB's main areas of concern relate to the NIC's Terms of Reference, rather than the questions posed in the Call for Evidence. In particular, we are concerned about the lack of any reference to (i) the Government's legally binding targets to reduce greenhouse gas emissions or (ii) the Climate Change Committee's recommendation to achieve a low carbon energy system (including a low carbon electricity network) by 2030.

Potential impacts of climate change

Climate change is the greatest single long-term threat to nature and to people, with one in six species at risk of extinction by 2100 if the temperature changes modelled by the Intergovernmental Panel on Climate Change (IPCC) come to pass¹⁰.

The RSPB recently published a new report on the impacts that climate change is already having on wildlife¹¹. For example, the 70% decline in UK kittiwake populations since the 1980s has been linked to climate change. Over the course of this century, impacts will only intensify and increase, particularly if action is not taken to limit climate change.

To avert these risks — and to enjoy the economic and social benefits of a healthy, natural environment — will require a transition to a low-carbon economy that takes place in harmony with nature.

Climate change targets

The UK marked itself out as a world leader in tackling climate change through the introduction of the Climate Change Act in 2008. It became one of the first countries in the world to set legally binding domestic climate change targets and, since then, many other countries have followed suit. These climate change targets set the UK on a trajectory to reduce its economy-wide greenhouse gas emissions by at least 80% from 1990 levels by 2050.

In order to keep on track for this 80% reduction, the Government's independent advisory body, the Committee on Climate Change (CCC) recommends that the UK needs to have reduced its emissions by 37% relative to 1990 levels by 2030. In order to achieve this, the UK needs a low carbon power sector that produces no more than 100 gCO₂/kWh. At present, our energy system has a 'carbon intensity' of around 450 gCO₂/kWh.

The CCC has said that while the UK is on track to meet its third carbon budget, there is concern about longer term progress. In order to meet the fourth carbon budget, 'significant action' will be required during this Parliament in order to keep the UK on track.¹²

An additional factor to be considered is the new evidence, published in the journal *Nature*, which has shown that, globally, the majority of fossil fuels will need to stay in the ground, if we are to achieve the global aspiration to keep temperature rises below two degrees¹³.

¹⁰ <https://www.sciencemag.org/content/348/6234/571.full>

¹¹ <http://www.rspb.org.uk/natureclimate>

¹² https://www.theccc.org.uk/wp-content/uploads/2015/06/6.737_CCC-BOOK_WEB_030715_RFS.pdf

¹³ <http://www.nature.com/nature/journal/v517/n7533/abs/nature14016.html> [Globally, a third of oil reserves, half of gas reserves and over 80 per cent of current coal reserves should remain unused from 2010 to 2050 in order to meet the target of 2 °C]

Transition to a low carbon energy system

The UK's energy infrastructure has shifted towards a lower-carbon energy system in recent years, including increased levels of renewable energy and the proposed phasing out of unabated coal. However, recent cuts to support for energy efficiency measures, solar, onshore wind and carbon capture and storage (CCS) technology, as well as an ongoing enthusiasm for developing new gas infrastructure, including fracking, could all jeopardise the UK's trajectory to a low-carbon future.

It is critical that the UK Government sets out new support for the renewable and energy efficiency sector in order to drive investment in the infrastructure we will need over the coming years and decades to achieve this low-carbon future. With the costs of established renewable energy technologies in the UK (onshore and offshore wind, solar) falling all the time¹⁴¹⁵, we believe that renewable technologies, coupled with demand reduction and energy efficiency measures, are likely to meet our energy needs at costs similar to - or cheaper than a - higher-carbon pathway.

Delivering energy infrastructure in harmony with nature

The RSPB strongly supports the appropriate siting of all infrastructure, such that it avoids adverse impacts on the natural environment. The RSPB is currently reviewing evidence and modelling potential impacts of different levels of deployment of a range of energy technologies. We will be publishing our findings and our recommendations on how to deliver energy infrastructure in harmony with nature in 2016.

Recommendations:

The NIC should recommend that the UK's energy infrastructure needs be met in a way that:

- (i) reduces greenhouse gas emission by at least 80% from 1990 levels by 2050;
- (ii) delivers a low-carbon energy sector by 2030;
- (iii) maximises the use of renewable energy technologies and minimises reliance on fossil fuels;
- (iv) is delivered in harmony with nature, resulting in no significant adverse effects and, where possible, delivering net gains for biodiversity.

¹⁴ <http://energydesk.greenpeace.org/2015/09/21/4-ways-the-uk-can-get-almost-all-its-power-from-renewables/>

¹⁵ <http://about.bnef.com/press-releases/wind-solar-boost-cost-competitiveness-versus-fossil-fuels/>

ANNEX 1. TRANS-PENNINE INFRASTRUCTURE PROPOSALS & INTERNATIONAL NATURE CONSERVATION DESIGNATIONS

The designations of most relevance to the proposed trans-Pennine infrastructure improvements are the Peak District Moors (South Pennine Moors Phase 1) SPA / South Pennine Moors SAC and the North Pennine Moors SPA / SAC. Key habitats in these designations include European dry heath and blanket bog, which provide a wide range of ecosystem services, including carbon sequestration. Key bird species include golden plover (*Pluvialis apricaria*) and merlin (*Falco columbarius*).

The Trans-Pennine infrastructure proposals which could have an effect on these designations are outlined below:

- (i) Improvements to the A628 (Manchester - Barnsley road): About 5km of the A628 road is straddled by the Peak District Moors (South Pennine Moors Phase 1) SPA / South Pennine Moors SAC, with an extra 1.5km where the SPA / SAC is on the south side only (i.e. 6.5km in total).
- (ii) Viability study for a Trans-Pennine road tunnel between Manchester and Sheffield: The Woodhead Tunnel would use an old (double) railway tunnel underneath the Peak District Moors (South Pennine Moors Phase 1) SPA / South Pennine Moors SAC, so would negate the need for the passing lane on the A628 for the 6.5km of SPA / SAC mentioned in (i) above.
- (iii) Improvements to the A57 between Manchester and Sheffield: About 5km of the Peak District Moors (South Pennine Moors Phase 1) SPA / South Pennine Moors SAC straddle the A57 on both sides.
- (iv) Viability study for dualling of the A66 (Penrith - Darlington road) and A69 (Carlisle - Newcastle Road): About 1km of the A66 is straddled by the North Pennine Moors SPA / SAC, with an extra 5km where the SPA / SAC is on the north side only (i.e. 6km in total).

ANNEX 2. Wallasea Island Wild Coast Project

Wallasea Island Wild Coast Project is a unique partnership between the RSPB and Crossrail which brings together Europe's largest civil engineering project and Europe's largest intertidal habitat creation project. The project demonstrates how major infrastructure schemes can help to enhance nature and 'future proof' low lying coasts against sea level rise caused by climate change as well as generating economic growth.

The project will transform 670ha of levee-protected farmland – an area twice the size of the City of London - back to a wetland landscape of mudflats and saltmarsh, lagoons and pasture. It will help to compensate for the loss of such tidal habitats on internationally important sites elsewhere. Once the project is completed, Wallasea Island, which lies 8 miles north of Southend-on-Sea in Essex, will provide a haven for a wonderful array of nationally and internationally important wildlife and an amazing place for the local community, and those from further afield, to come and enjoy.

The challenges that the Wallasea project seeks to address are real and pressing. Four hundred years ago, the Essex coast was a wild and stunning place, a haven for wildlife – including 30,000ha of intertidal saltmarsh - and a source of livelihood for local communities. Sadly, today, less than one tenth (2,500ha) of this wild coast remains due to land claim for agriculture and accelerating coastal erosion. Across England, saltmarshes and mudflats are continuing to decline at a rate of 100 hectares a year. This rate of loss will accelerate with climate change as rising sea levels and more storminess steadily erode the precious transition zone between land and sea.

With much of the island lying 2-3 metres below sea level at high tide, it has become uneconomic to protect Wallasea with traditional, hard engineering flood defences (i.e. sea walls). The project demonstrates a more sustainable approach to flood risk management, using managed realignment. Current flood defences will be breached, allowing flood water to be let into the island in a controlled way in the event of a tidal surge. This will reduce the risk of an unmanaged breach and associated negative impacts, including disruption to navigation, erosion of adjacent sea defences and loss of built assets on Wallasea. The project will also help to mitigate the impacts of climate change by sequestering approximately 4 tonnes of carbon dioxide per hectare (i.e. over 2,000 tonnes across the whole site) per year.

The project requires the importation of 10 million tonnes of soil. 3 millions tonnes of this has been provided from the £14.8 billion Crossrail project, using excavated material from the 42km of Crossrail tunnels that have been dug under London. This represents half of the total amount of excavated material – 6 million tonnes (enough to fill Wembley Stadium three times over) – that has been produced by the Crossrail project. 80% of the excavated material has been transported by rail and boat, removing 150,000 lorries (and their associated health, safety and environmental risks) off the streets of London. The RSPB is currently seeking partners to provide the remaining 7 million tonnes that it requires to complete the project.

Planning permission was granted in 2009 and the first phase of the project - Jubilee Marsh - was completed in July 2015. The project is due to be completed by 2020, and will cost about £50m in total.

National Infrastructure Commission

RTPI Evidence on Transport in London

8 January 2016

Introduction

The Royal Town Planning Institute (RTPI) has over 23,000 members who work in the public, private, voluntary and education sectors. It is a charity whose purpose is to develop the art and science of town planning for the benefit of the public. The RTPI develops and shapes policy affecting the built environment, works to raise professional standards and supports members through continuous education, practice advice, training and development.

Consultation Questions and Answers

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

Governance

A key challenge is how London and the rest of the South East are governed together in a joined-up manner. It can be helpful to consider the rest of the South East in two zones. The South East Study 1964 identified the **Outer Metropolitan Area (OMA)** (roughly equivalent to the Metropolitan Green Belt plus the (substantial) towns within it, and the **Outer South East (OSE)**. These definitions seem to hold today, and certainly avoid the political and public relations difficulty of referring to the “commuter hinterland” of London (which in any case is a partly misleading term as there are many jobs in the OMA itself). The key questions around transport infrastructure probably apply to the OMA.

Various attempts have been made to address the governance question and none have been totally satisfactory. It is interesting that in northern cities the Government has insisted on joint working across a travel to work area, but due to the existing Mayoral arrangements for London inside the M25, there has been no similar requirement of London.

The creation of the Mayoralty led in the first two terms to a fairly limited discourse between the Mayor and the counties round about. Under the Labour government three different regional plans were pursued for the London and OMA. The debates around the latest

alteration to the London Plan have begun to cause a more extensive debate, but still one very much choreographed by the Greater London Authority, rather than on a broader and more neutral platform.

The RTPI has argued for both much stronger but voluntary cooperation on strategic planning between the planning authorities *within* the counties of the OMA but also for cooperation between neighbouring strategic planning areas. In this context this would be between the GLA and the surrounding counties. In our view these must take place within a context of incentives. This can operate such that counties are incentivised to take additional housing in return for public spending on issues which are important to them, such as schools, health care facilities and transport investment. Imposing London overspill on surrounding areas has not in the past proved successful and is politically unwise.

Fragmentation of decision making

Fragmentation is not only a challenge across the geography of the London region, but especially seriously across sectors. One difficulty with the proper planning of housing and transport in the wider London region has been the disconnection between decisions on fares, decisions on train operation and decisions on land use. An example is the situation at Ashford where the international operation of the station has been reduced despite its significance as a growth point.

Social balance

Various factors are putting the continued social balance of London seriously at risk. These are high prices for private homes, high private sector rents, very low levels of social housing construction, loss of high value council houses (proposed), bedroom tax, and estate “regeneration” (where leaseholders in particular run the risk of not being able to buy back into their estate).

As a solution to housing shortage some commentators have proposed that homes should be built in the OMA and/or in the part of the Metropolitan Green Belt within the M25. This would only be of value to low income Londoners priced out of inner London if both fast times, sufficient capacity and, critically, *affordable fares* are guaranteed. Conventionally, the stock broker belt is so called for a reason : only higher paid staff could afford the travel and had the option of sociable working hours. Far flung destinations are only conceivable solutions for low income housing if travel is timely and above all cheap.

Air quality and Carbon reduction

London’s air pollution is breaching European safety limits and road traffic levels remain too high. The next Mayor should take a proactive approach to tackling this problem, which recognises the potential to achieve major public health and productivity gains through low-carbon transport measures. These should include advancing the implementation of the Ultra Low Emissions Zone and extending the Congestion Charging Zones to restrict the number of polluting vehicles on the roads, complemented with a new fleet of electric buses and taxis, a

city-wide network of electric vehicle charging stations, and by doubling the number of safe, integrated cycle routes by 2030.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to, Crossrail 2?

The choice of locations for large scale infrastructure should be informed by where it can unlock substantial housing investment. This would include the Barking Riverside area where commitments have been made.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

We would repeat our comments above that it is essential to relate the scheme as closely as possible to additional housing development. Crossrail 1 and the northern line extension have been funded on the principle that its only business landowners who should pay for infrastructure through higher tax revenues. While the principle of taxing increased land values is sensible, It is our view that the owners of land for business and the owners of housing land should both be liable for tax contributions to cross rail 2.

However, a balance must be struck from using the enabling development solely to raise as much money as possible, and other priorities from the use of land, such as meeting London's housing need in the round – and also *the housing needs* . Too often using public land for the narrowly profitable purposes

[Contact redacted]

Royal Town Planning Institute
The RTPI is a charity registered in England (262865) and Scotland (SC 037841)

Siemens response to National Infrastructure Commission call for evidence - Large-scale transport infrastructure improvements in London

Introduction

This document forms part of Siemens' response to the consultation published by the National Infrastructure Commission. The response relates to the third part of the call for evidence: **London's transport infrastructure**.

Siemens in the UK employs almost 14,000 people across the UK with 13 manufacturing sites and multiple other facilities.

London and the wider South East are an important market for our various businesses, where we employ around 2000 people. Siemens manufactures and maintains the highly reliable mainline trains operated by South West Trains, Heathrow Express, Greater Anglia and London Midland among others, transporting passenger in safety and comfort in and around the capital. From 2016 Siemens will introduce the state-of-the-art Class 700 fleet to the UK. These new trains will provide a much improved passenger experience on the Thameslink route and help to create 2,000 jobs across the UK supply chain.

Siemens has been involved in the signalling of London Stations for over 150 years. We resignalled the Victoria line in time for the 2012 Olympic and Paralympic Games and are working with London Underground on continuous improvements. We are now resignalling the Thameslink route, and supplying Crossrail with signalling, train supervision, station and line management and train control.

Elsewhere, using the latest electric traction drive technology from Siemens, London's new Routemaster buses are up to 40% more fuel efficient than diesel buses with a 47% reduction in CO₂ and a 78% in NO_x (nitrogen dioxide). Siemens' detection and enforcement system architecture is helping London to reduce traffic levels, congestion and pollution as part of the London-wide Congestion Charge and Low Emission Zone.

Siemens also supports London's energy and safety needs. Siemens fire safety technology protects 84% of buildings and safeguards 90,000 people at Canary Wharf. In Bexley, Siemens provides 24/7 CCTV services, helping transform the area into London's safest borough.

Finally, Siemens invested £30 million in The Crystal at Royal Victoria Dock. As one of the World's most sustainable buildings and home to the World's largest exhibition on urban sustainability, the facility also houses our city experts who are working on making city infrastructure around the world cleaner and more efficient.

We are therefore responding to this call for evidence as both a business user and major supplier of infrastructure technology and services in London and, indeed, elsewhere. We have responded in broad terms to specific questions on strategic priorities for London's transport infrastructure. We have also contributed to the CBI's industry wide response to this call for evidence. However, technical innovation often plays a major role in determining the right transport solution to a particular project or problem, whether that is over-capacity on the railways or congestion on the roads. As such, our evidence sets out what we see as the major challenges facing London's transport infrastructure and some of the technologies, which we as suppliers believe could address these. We also outline potential delivery challenges.

Response to Questions:

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

The economic and social challenges facing London are well known. It is a city on the move, which is predicted to grow from 8.6 million in 2015 to over 11 million by 2050. Such development is a testament to London's ongoing success, but it creates pressure on public services, increases demand for housing and exacerbates environmental challenges faced by the city, such as poor air quality. Investments in transport connectivity and technology can play a significant role in addressing these challenges by making existing areas more attractive to live in, opening up new areas to development and helping to reduce energy consumption and air pollution.

As London continues to grow the primary and overarching challenge for London's transport system is one of capacity. The strain on the capital's transport arteries is considerable and will only increase. Whilst there are a range of short term options that can be considered, such as better access to platforms through increased provision of lifts or escalators, these measures will only help with the existing volume of passengers and are not sufficient to cope with continued growth.

In addition when it comes to rail/metro provision, there are some notable black spots within the capital. For example, when travelling between areas south of the river - by tube or train - passengers often have to go into central London and then back out again.

Large scale projects such as Crossrail 1 and the Thameslink upgrade will help reduce capacity issues but we need more of these types of projects. Moreover when it comes to the Tube network, we are coming to the point where changes to the existing infrastructure are not having the impact needed and whole scale re-developments will be needed to provide for continued growth in passenger numbers. There has also been a marked increase in the risks related to operating a world-class transport system both in terms of cyber and the physical threat from terrorists. These are threats that will need to be considered as we continue to upgrade and develop the network.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

2.1. Making the right choice at the outset: Technological Innovation and Financing

As a business user, and to address the capacity crunch outlined above, we are supportive of projects such as Crossrail 2 that will help to alleviate congestion on busy routes into central London. We also

believe that river crossings, particularly in the east of London, are key to unlocking London's future development potential and meeting the target of 50,000+ new homes per annum.

However as a supplier and finance provider towards infrastructure projects we would also make a broader point about the importance of making the right choice about technology and finance solutions to infrastructure problems at an early stage.

Technical innovation can play a major role in determining the right transport solution for a particular project or problem. Whether it be in the latest technologies for rail signaling and train control to improve capacity and performance, or smart technologies which can optimise road space, prevent congestion before it occurs, and manage parking systems in cities and towns to maximise parking availability, it is increasingly the case that technology can play a major role in determining which transport solution might be the most appropriate for a given set of circumstances or objectives.

Having overall control of the London Transport network, TfL has the unique opportunity to introduce a smart ticketing system to encompass an integrated travel information system which would encourage travellers to move between various modes of transport dependent upon demand, capacity, weather conditions etc.

More efficient use of road and rail capacity through the use of smart technology can itself be a transport solution, perhaps in certain circumstances even avoiding the need to build brand new capacity altogether. Technology can therefore also drive down costs and drive up efficiency not just for individual capital projects, but for the wider management of transport systems.

It is therefore increasingly important that technical considerations are taken into account at the earliest stages of a project development to ensure that the right solution to a particular problem or wider transport objective is developed from the outset. Technology should not be an issue that is left to be addressed once a particular transport solution has been decided upon.

Similarly when considering financing of large and complex projects a full analysis should be undertaken of all the options at the outset. While Public Private Partnerships (PPPs) often come in for criticism we consider such structures to be highly beneficial under the right circumstances in the transferring of risk from the public sector to those best able to manage and control them.

It was noted that on the Crossrail Rolling Stock Project the funding route changed from a PPP to public funding towards the end of the bidding phase. Such changes at the end of procurement and once a full submission by all the bidders required further rounds of bidding. This is inefficient and adds cost and time for both the procurement authority and the bidders.

That said, International Finance Institutions such as the European Investment Bank (EIB) provide funds to both the Public and Private Sector and we encourage full use of their facilities. EIB provides long term debt on advantageous terms and Siemens uses EIB worldwide. We are aware of TfL's use of EIB in financing its projects.

2.2. Technological solutions

Rolling stock and Refurbishment

New rolling stock can dramatically improve the experience of commuters while also helping to alleviate capacity issues across the network. Siemens' new fleet of Class 700 trains, which will run on the Thameslink line from spring 2016, will provide 80% more peak seats across central London from

2018. The New Tube for London would also provide a similar step change in terms of capacity right across the Piccadilly, Central, Waterloo & City and Bakerloo lines.

Refurbishment programmes, such as that for the 1995 (Northern) and 1996 (Jubilee) stock, can only go so far in solving the capacity problem. As a world city, passengers expect high standards from London's transport system. Refurbishment does not always provide the step-change that most people expect but can go some way to helping to bridge the gap whilst the larger scale projects are in development. However, even after further upgrade to the Tube there is still likely to be a saturation point when we reach a maximum potential capacity. As a result, rolling stock is only part of the solution. There needs to be a fully joined up approach with signalling in the capital to push the performance of trains

Signalling

Delivering increases in the number of trains per hour should also be a priority. State of the art signalling and modern trains are key to achieving this. While the Victoria line is currently operating at up to 34 trains per hour the goal is to further increase the frequency for this line together with other tube lines by both optimising the current technology and introducing new state of the art signalling technology.

Traffic

Without further measures to reduce or redistribute demand (e.g. extend the Congestion Charging area), road traffic is forecast to increase over the next decade and beyond. To help mitigate the effects of this increase, TfL is already extending the use of SCOOT throughout London. SCOOT (Split Cycle Offset Optimised Technique) is an algorithm, originally developed by the Transport Research Laboratory, and adopted by TfL which adapts traffic signal timings automatically according to current traffic conditions.

All of the traffic signal junctions in London are connected to a central Urban Traffic Control (UTC) computer system which runs SCOOT on those junctions equipped for it. For those junctions not equipped with SCOOT, the traffic control plans are mainly fixed and are not automatically adaptable. It therefore makes sense to extend SCOOT control to most, if not all of London's signalised junctions.

SCOOT also gives TfL the capability to change priority for certain road users; for example SCOOT can run a plan optimised for cyclists, or for pedestrians or for road traffic travelling on certain arteries such as the North Circular.

The second option to alleviate future road traffic congestion is SITS: SITS stands for Surface Intelligent Transport System. SITS will bring in advanced methods for collecting data on the state of London's road traffic, including cyclist. These methods currently include sensors in the road for road based traffic, above ground sensors for people and road traffic and use of Automatic Number Plate Recognition (ANPR) cameras for collection journey time information. Extensions to these sources will include Bluetooth data, GPS data, Mobile Phone data and many other data sources yet to be developed. These extra data sources will improve the "eyes and ears" of SITS to make more intelligent decisions based on current conditions. TfL will also deploy predictive modelling techniques using and combination of a "model of London" and simulation to predict the future state of congestion given a set of initial conditions. This will help TfL to get more capacity out of the existing road network and will also assist with a more rapid response to planned or unplanned

events. TfL will also be able to forecast the effect of roadworks on the immediate and surrounding areas and to simulate the effects of remedial actions.

Hybrid, Electric and Hydrogen vehicles

In addition to taking steps to tackle traffic, more can be done to accelerate the roll-out of hybrid, electric and hydrogen vehicles, including buses. These can play a major role in ensuring that London keeps moving and air quality is improved.

Modern urban transport networks have been developed over several decades based upon the availability and operational characteristics of diesel fuelled transit buses. Currently there are more than 8,000 diesel buses operating in London and while many of these vehicles use reduced emission hybrid technology, significant levels of harmful pollutants are still emitted as diesel remains the primary fuel source. However advances in battery and propulsion technology over the past five years have made zero emission transit buses a reality in many global cities, including London. Nonetheless many obstacles remain, preventing this new technology to evolve and mature from pilot phase into scalable real world applications. To overcome some of these challenges and support sustainable deployment of zero emission buses, Siemens has developed a number of electric fuelling solutions. Already deployed in Europe and North America, automated opportunity charging systems, intelligently networked to the distribution grid, permit wide scale roll out of electric buses within existing transit operations.

London already has some small fleets of fully electric vehicles in service and has been operating Hydrogen Fuel Cell vehicles zero emission buses on route RV1 between Covent Garden and Tower Gateway since 2011. There are eight buses in operation which means it is the first time a whole route has been fully operated by hydrogen powered buses in the UK.

2.3. Deliverability

The terms of reference accompanying this call for evidence also seek views on the deliverability of strategic transport priorities. As major suppliers, we would highlight the following general issues which need to be considered in relation to potential rail upgrades:

Challenges for TfL

Transport for London (TfL) has performed well in a number of recent passenger surveys, with satisfaction across the Underground at an all-time high between December 2014 and March 2015. However they face the challenge of having to continue to build on these numbers whilst facing budget cuts. This is clearly not an issue within the remit of the NIC, but it is important consideration nonetheless.

Project Delivery

With a significant amount of investment planned for London's transport network the coming years we will see a number of large scale projects being carried out at once. Whilst there is likely to be some disruption, we need to ensure that every measure necessary is taken to minimise the impact on the day to day lives of Londoners and commuters. This can only be done with excellent planning and co-ordination between all parties involved in the upgrade. We can, where possible, also try to keep existing systems going until the new ones are in place and ready to use. For example, when re-signalling the Victoria Line, Siemens kept the existing system running while they were implementing the changes, ensuring the transition ran as smoothly as possible

Skills

Over the next 10 years, 3,300 new workers are needed for to help meet the UK's Traction & Rolling Stock (T&RS) needs alone. This represents a serious challenge for the future of London's rail network.

This skills shortage is why Siemens has established the National Training Academy for Rail (NTAR) in Northampton, which will provide 20,000 man days of training per year. NTAR has enabled SMEs to access best in class training for rolling stock maintenance. By taking leadership in important areas such as these, larger players can open the door to market access for those companies that sit within their supply chain. One of the great benefits of NTAR is its links to other academies across the country, which all seek to complement each other. For example, National College for High Speed in Birmingham and Doncaster will have a different remit from that of the site in Northampton.

It is important that industry continues to invest in skills, but we need to do so in partnership with government at all levels and with the knowledge that there is a pipeline of work in order to sustain the rail sector and retain skilled employees.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Maximising industrial opportunities

As outlined above industry need certainty and a long-term investment and planning horizon if it is to invest in skills and innovation to drive down costs. The creation of the NIC is a welcome move in this regard if it leads to longer-term certainty in the UK's infrastructure investment. As widely recognised the rail sector in particular has suffered from the on/off approach to public spending which has often been adopted in the UK. Developing Crossrail 2 and other similar major transport projects not just in London, but elsewhere in the country, will help the UK to maximise opportunities in the associated supply chain and services sector.

Stakeholder engagement

The high level of stakeholder engagement already witnessed on the Crossrail 2 scheme is to be welcomed. Consultation with stakeholders and the public is also absolutely crucial when planning and delivering large scale rolling stock improvements in the capital. The Class 700 benefitted from feedback from UK train operators, train crew, cleaners and maintenance staff, as well as dedicated passenger research. Any future rolling stock project from Crossrail 2 would benefit from a similar programme.

Predictive maintenance

Siemens has led the rolling stock industry in terms of predictive maintenance. Our new depot at Three Bridges – part of a €400million investment – is leading the way in this area. By catching a fault early, a more considerable cost associated with a full replacement can be avoided. It also reduces the likelihood that passengers' journeys will be affected. Siemens' new facility at Three Bridges has an automatic inspection facility which uses laser measurement to accurately predict when key train components need to be maintained or replaced.

Aligned incentives

Crossrail 2 would benefit from the introduction of performance based contracts, whereby suppliers and manufacturers are incentivised for their performance. This works to encourage and drive

excellence while ensuring the Government receives good value for money after the main procurement process has been completed.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

Raising finance

Raising finance is a crucial part of some procurement processes, however we realise that it is not always possible to do this quickly. The contracts for the Intercity Express Programme and Thameslink were awarded more than two and a half years later than intended, partly due to issues with securing funds during the financial crisis.

As the UK's economy recovers the challenge is to continue to attract investors seeking a stable return, such as pension funds. They will be won over more easily if the right contractual structures are in place, these need to be transparent with an emphasis on the benefits of entering into the agreement.

In terms of alternative financing models we note and support the success of the Crossrail Business Rate Supplement which financed £4.1 billion of the costs of the £14.5 billion Crossrail project. Worth 2p for business properties with a rateable value of more than £50,000. Smaller firms around the new line's stations were required to pay as they will benefit most. We are supportive of a more general use of the Business Rate Supplement provided it is, as now, capped and subject to approval by local stakeholders.

Green Bonds

The Climate Bond Initiative estimates the Climate-Aligned Bonds market, which includes labelled green bonds and unlabeled climate-aligned bonds, to be \$598 Billion in 2015. The majority fund transport solutions (around 72 percent) and energy (15 percent). Unlabeled green bonds are an important source of finance for projects that have an impact on reducing GHG emissions, for example a new railway.

In June 2014, Johannesburg successfully issued a green bond, becoming the first C40 city to do so. The bond, with a value of US\$143m, was 1.5 times oversubscribed and will finance a wide range of green infrastructure projects across the energy, water, waste and transport sectors. In Washington DC, the District of Columbia Water and Sewer Authority (DC Water) has issued a \$350 million 100 year green bond. The bond is helping to finance a portion of the DC Clean Rivers Project, a \$2.6 billion project to construct tunnels that will transport combined sewer overflows, to DC Water's Blue Plains Advanced Wastewater Treatment Facility. The project serves several "green" purposes including improving water quality for the District, flood mitigation and waterfront restoration

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

Decision-makers in London should be able to draw on ideas and experiences in other cities and countries to ensure that we develop the best transport system possible. Drawing on Siemens' extensive experience in other contexts, some solutions adopted in other countries are outlined below.

Protecting the environment

One of the central challenges for London is ensuring growth is sustainable, mitigating as much as possible potential impacts on the environment. This can be done by ensuring that all new rolling stock are designed for the future, meaning that they are based on the latest technology that allows them to be energy efficient for the duration of their life span.

The **C2 metro train for Munich Underground**, unveiled by Siemens towards the beginning of 2014, sets new standards in energy efficiency. Forming part of an eventual fleet consisting of 126 new metro cars, the train is:

- Up to 97 percent recyclable
- Energy-efficient, thanks to the recovery of up to 50 percent of the braking energy
- Has LED lighting throughout

Hybrid buses powered by Siemens in Swedish cities

Volvo's new electric ZeEUS12m plug-in hybrid bus with Siemens fast-charging technology have started running in Stockholm after having been tested in Gothenburg over a period of three years. The tests have shown that plug-in hybrid buses reduce fuel consumption by more than eighty per cent and the total energy demand by more than sixty per cent.

Siemens' Velaro family of high speed trains operate worldwide including on HS1 in the UK and routes in Germany, Russia, China and Turkey. The train has been modified for a number of different conditions but has energy efficiency right at its heart, this includes features such as:

- Aerodynamic optimization on the roof section reduces sonic boom in tunnels. This includes fully encased roof-mounted equipment and an aerodynamically refined spoiler, nose, and front section
- Surplus braking energy which is fed back into the power grid
- Both of these features reduce energy consumption and CO2 emissions. The overall result is equivalent to a gasoline consumption of 0.33 litres per seat and 100 kilometres

eHighway to reduce CO2 and nitrogen oxides

Siemens is currently trialling our eHighway system in Los Angeles and Gothenburg. This allows road freight transport to be powered by electricity, combining the efficiency of the railroad with the flexibility of trucks into an innovative freight traffic solution that is efficient, economical, and environmentally friendly. The system makes it possible to reduce the use of fossil fuels and truck operating costs, at the same time eliminating local emissions such as CO2 and nitrogen oxides. Almost 90% of freight in the London area is carried on the roads and thus a significant contributor to congestion and pollution and the amount of freight is increasing due to the "Amazon effect". The use of electric vehicles for freight including last-mile (or "last two-kilometres") logistics would help to alleviate the pollution caused.

Reliability

The levels of reliability required by TfL are significant. Suppliers of a range of products need constantly to innovate and develop new technologies.

As with any Siemens train, the C2 Metro train for Munich Underground is manufactured and maintained to exacting standards. Cutting edge, highly reliable technology means increased time between maintenance, increasing availability to the operator.

In Spain the Velaro train operates the busy Barcelona to Madrid high speed route where it travels well over 500,000 kilometres a year with punctuality exceeding 99%.

Integrated transport

As London's rail network continues to grow the challenge is to ensure integration between various modes of transport. Siemens is undertaking work with the German Federal Ministry of Economics and Technology to integrate further different transportation providers. A key part of this is a B2B IT platform which provides access to information (e.g. for route planning) and transactions (for bookings and reservations). Integrating 'mobility partners' such as bus, taxi, (e-)car sharing, bike-sharing, parking has a number of benefits including:

- Environmental – e.g. by reducing traffic congestion or time spent searching for car parking spaces
- Financial – studies show that such a service can generate additional revenue for transport providers

Procurement should include state of the art multi-point solutions for city infrastructure and promote innovation which is critical for UK infrastructure. Such improvements can also be justified in terms of productivity.

Further information and follow-up:

We would welcome the opportunity to meet the NIC team to further explore the topics listed above. For this or any questions arising from this response contact:

[contact redacted]

Siemens plc, 8 January 2016

About Siemens

Siemens AG (Berlin and Munich) is a global technology powerhouse that has stood for engineering excellence, innovation, quality, reliability and internationality for more than 165 years. The company is active in more than 200 countries, focusing on the areas of electrification, automation and digitalization. One of the world's largest producers of energy-efficient, resource-saving technologies, Siemens is No. 1 in offshore wind turbine construction, a leading supplier of combined cycle turbines for power generation, a major provider of power transmission solutions and a pioneer in infrastructure solutions as well as automation, drive and software solutions for industry. The company is also a leading provider of medical imaging equipment – such as computed tomography and magnetic resonance imaging systems – and a leader in laboratory diagnostics as well as clinical IT.

In fiscal 2014, which ended on September 30, 2014, Siemens generated revenue from continuing operations of €71.9 billion and net income of €5.5 billion. At the end of September 2014, the company had around 357,000 employees worldwide. Further information is available on the Internet at www.siemens.com. October 2015

National Infrastructure Commission call for evidence: London's transport infrastructure

Written evidence submitted by Slough Borough Council

Introduction

Slough is integrated into the heart of the UK transport and communications network, being located between the M4, M40 and the M25. It benefits from three exits off the M4 motorway giving easy access to both London and the West Country, three railway stations (Slough, Burnham and Langley) providing links to Reading and London Paddington via the Great Western mainline and is located within 10 minutes of London's Heathrow Airport.

The borough is home to the Slough Trading Estate, the largest privately owned industrial estate in Europe, and has the highest concentration of corporate headquarters in the country (outside London). Slough is attractive as a business location because of its transport connections but it lacks a direct rail connection to Heathrow, something that local businesses say is required – Heathrow currently has rail access in only one direction, towards London.

Slough has broadly equal numbers of outward and inward commuters travelling to and from London on a daily basis – 13,178 residents travel to London and 11,012 workers travel from London [source: Census, 2011].

Many Slough residents rely on Heathrow for their livelihoods, with more than 7,000 working in airline related industries, and with 5.6% of Heathrow's directly employed staff drawn from Slough.

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

We question the reference to commuter hinterland and would ask that the commission recognises the interdependencies in the commuter patterns and in business structures and reflect that Slough functions as a part of a greater London.

- Economy – Slough has a strong and thriving economy but the town's proximity to London and its strong links with the UK's transport and communications network are recognised as providing a key locational advantage for business. Access to this concentration of business and employment land on the edge of London adds to the city's critical mass as a global centre, supply chain opportunities and other synergies. Securing a pipeline of affordable employment land and premises is a challenge.

- Labour supply – Analysis by the Thames Valley Berkshire Local Enterprise Partnership (TVB LEP) has identified labour supply issues as the single biggest threat to the continued growth of the Berkshire economy.
- Skills – The demand for higher level and specialist technician level skills by business continues to grow and the skills system is not always delivering what business needs leading to skills shortages and hard to fill vacancies. The increase in travel to work times suggests that businesses have to recruit from a wider catchment area to fill their vacancies.
- Housing – Demand for housing is increasing rapidly and the recent Strategic Housing Market Area Assessment (SHMAA) for Slough has indicated that we need to build in excess of 900 dwellings each year, a significant increase on the previous SHMAA of less than 350 dwellings each year. The delivery of schemes such as Crossrail, are driving up the demand and cost for housing locally. The shortage of development land for housing represents a significant challenge in delivering the housing numbers required to satisfy the housing need from within the borough and therefore any outward movement from London.
- Transport – Slough is well served by rail transport links in to and out of London but lacks the rail transport infrastructure to make orbital journeys around London. The Western Rail Link to Heathrow scheme due to be delivered by the end of Network Rail's Control Period 6 programme is a vital link for Slough, the wider Thames Valley and further afield in providing a direct transport link to Heathrow.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?

What might their potential impact be on employment, productivity and housing supply in London and the southeast?

Western Rail Link to Heathrow (WRLtH) – This scheme offers economic and environmental benefits to London by strengthening its economic hinterland as well as to the hinterland. It will improve access to Heathrow for 12 million people to the west of

London, particularly the Thames Valley and including the far south west and south Wales. It has the potential to deliver a through route to Paddington via Heathrow.

- The business, economic and environmental case for the scheme, first assessed in 2011 and now being refreshed and based on the current two runway airport, is strong – £1.5 billion of efficiency savings, £800 million of additional economic activity, 42,000 new jobs, modal shift from road to rail, one million fewer road journeys and 5,200 tonnes less CO2 released into the atmosphere – and projected to be stronger.
- The scheme is particularly important in retaining major business in the Thames Valley and beyond. 75% of businesses state access to Heathrow as a primary factor in their choice of location.
- The maintenance and enhancement of the strength of the economic hinterland will have additional benefits to London. The potential modal shift of traffic to Heathrow from road to rail (currently estimated at c20% from Reading and Slough) will have a positive impact on traffic flows on the strategic road network to the immediate west of London.
- The scheme is now anticipated to enable an additional through route from the west to Paddington, so creating added capacity, resilience and passenger options on the rail network and potential greater modal shift. This will have additional economic and environmental benefits to London and the hinterland.
- The scheme has been confirmed in the Hendy Review but to a later timetable. This largely reflects the past and recent delays in delivery. It will now not be operational until 2024 delaying the realisation of significant benefits and potentially deterring business commitment further. It was originally anticipated that the scheme could be open for use before 2020.

Action: We would like to see the National Infrastructure Commission reviewing the scheme delivery plan and working with delivery agencies to identify and implement actions that bring forward the operational date. Schemes which have a strong business case, strong local and regional support, and a clear identified need should be prioritised.

Action: We would like to see the National Infrastructure Commission reviewing the Development Consent Order (DCO) process in general to look at the burdens and delays inherent within the process to identify ways in which it can be streamlined.

Great Western Mainline services – A fast (under 20 minutes) train service to London is available twice per hour only with the remainder of trains operating as stopping services taking in the order of 45 minutes to reach London. Although not a large scale infrastructure improvement, incremental upgrade of services to run more frequent fast train services would make a significant difference to train service users in and out of London. Similarly, by introducing Oyster card payment (scheduled for introduction when Crossrail services go live) or contactless payment card systems now would provide rail service users with simpler, faster access to trains.

Cycle schemes – Slough has invested in a [cycle hire](#) scheme which it would like to see integrated with the London “Boris Bikes” scheme, extending the reach of the Slough scheme and providing a seamless hire facility for cycle users. To facilitate safe cycling we would like to see investment in safe, green cycle pathways connecting Slough to London, for example, by upgrading the towpath of the Grand Union canal.

Slough Mass Rapid Transit (SMaRT) – Slough has started work on a scheme that will provide a priority bus service for workers arriving at Slough Station to travel to their workplace on the Slough Trading Estate; the second phase of this scheme will see the service extended to Heathrow. We would like to see the service extended further but this will not be possible without the support of Transport for London and the London Borough of Hillingdon.

Action: We would like to see the National Infrastructure Commission recommending and facilitating closer working between public transport authorities to create more flexible bus service routes and supporting road network upgrades to facilitate priority bus services, for example, A4 corridor from Slough to Hillingdon.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

No comment.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?

What innovative funding mechanisms could be considered to support delivery of key schemes?

No comment.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

No comment.

Slough Borough Council gives consent for this submission to be published and identified as the author.

[contact redacted]

Submission dated: 8 January 2016

South London Partnership
Response to National Infrastructure Commission Call for Evidence
January 2016

1. Introduction

The South London Partnership represents the Boroughs of Croydon, Kingston upon Thames, Merton, Richmond upon Thames and Sutton, and through the South London Transport Strategy Board also involves Lambeth, Wandsworth, TfL, operators and businesses in developing a transport vision for the sub-region. Through the South London Growth Board, working with the GLA on wider economic development issues, we are also actively engaged in making the case for increased investment to enable economic growth of the sub region.

The South London partners have an agreed vision for the sub-region:

"South London will be a vibrant sub-region contributing to London's competitiveness and sustainability, through increased employment, a high skilled workforce and a high quality of life – supported by an enhanced and sustainable transport infrastructure".

We are therefore strong advocates for South London on all transport, planning, economy and business matters, as evidenced by our work to date with a wide range of stakeholders, agencies and communities.

2. The call for evidence

We welcome the creation of the National Infrastructure Commission and its objective of providing independent advice to government on long term investment choices. We recognise that the plethora of agencies historically involved in major infrastructure decisions have not always been coordinated or managed well and therefore we would expect that future infrastructure plans and policies will be enhanced by your role.

This response to the call for evidence has been developed by the South London Transport Strategy Board and reflects strategic sub regional matters or concerns shared by all of our Boroughs, and where appropriate specific local issues of the individual South London Boroughs will be considered in their own organisation's responses.

Having reviewed the call for evidence we will focus our response on section 3: London's transport infrastructure.

In our response below we identify the key issues for South London and then provide more specific comments that reflect the questions in the call for evidence.

3. Key issues

We have in recent years made the case for significantly enhanced transport investment for South London to not only resolve existing transport capacity, reliability and quality issues, but build sufficient network capacity to enable our medium and long term growth objectives and targets to be achieved.

The growth agenda remains a key issue for South London. The population forecasts are now double those identified in the 2004 London Plan, with the latest projections at nearly 240,000 additional people by 2020 (that's equivalent of another Merton) rising to over 400,000 by 2031 (equivalent to another Croydon).

This of course creates great pressures on employment and services. The London Plan forecasts around 800,000 additional jobs but these are mainly located in the City. The GLA forecasts that South London is set to achieve only 40,000 additional jobs. SLP has developed alternative forecasts showing the sub-region could grow by 120,000 additional jobs. Far from being overly ambitious we believe that with the population now forecast to double even this number of new jobs is insufficient to keep in line with general population growth. We should be seeking to achieve one new job for no more than every two people added to the South London population.

The South London sub-region is well connected to central London by rail from our largest town centres but overall it has the lowest connectivity of any sub-region and we believe this is a principal constraining factor on our economic growth. We recognise that South London needs to access employment in Central London and the Docklands but also needs to have sufficient connectivity to develop our sub-regional centres to facilitate economic growth locally. As a 'resource exporter' South London in effect is an economic 'donor' to other areas of London, which is undermining our own sub-regional economic sustainability.

We can, of course, point to the scale of the transformation already underway, and the approach adopted by our Boroughs - for example Croydon's Growth Zone will deliver upwards of 23,500 new jobs and 8,300 new homes in Croydon's opportunity area by 2031, through the development of brownfield sites in the centre of the borough. The annual Gross Value Added equivalent of these jobs is estimated to be in order of £1.2 billion by 2031. Croydon's growth zone will therefore have a significant positive impact in delivering South London's Growth+ agenda and its success is built on strong existing and enhanced future public transport links.

With Croydon's renaissance already well underway, Kingston is also on a trajectory to deliver its own significant growth aspirations. The Borough is working with the Mayor on developing an opportunity area framework which will deliver new jobs and homes, as well as bringing forward district centre regeneration, for example in Tolworth. Sutton and Merton are also planning a significant housing contribution through the designation of housing zones in Sutton Town Centre, Hackbridge, and Morden; and Richmond provides outstanding quality of life, with some of South London's most attractive and popular residential areas. These opportunities for growth and regeneration amount to substantially more than 'business as usual', and are based on a clear vision and driving ambition to make South London the capital's first choice business and development destination which will deliver our Growth+ agenda.

Even if South London were to conform to what is sometimes seen as its traditional suburban role the need to deliver housing that meets our existing community requirements is also an increasing concern. We have sites in South London that are recognised as suitable for development but are slow to be brought to market because of

both perceived and real connectivity issues. A step change in transport infrastructure, network capacity and service quality, across all modes, is therefore needed to give the private sector confidence to invest in building new homes in our Boroughs.

South London has the highest road-based modal share of any sub-region, together with some of the slowest journey times due to congestion and inadequate road capacity. Indeed TfL have indicated that parts of our sub region already have longer journey times and higher congestion than is forecast without any investment by 2031 in parts of East London. In short our case for investment in all modes is more pressing than most other sub regions of London.

Many residents, workers and businesses in South London are dependent on rail services, given the sparse nature of the London Underground network, and they are vital to the continued growth of the South London economy. With the limited Underground provision in our sub region this inevitably places great reliance on the heavy rail infrastructure provided by Network Rail. Through our South London Rail group we have been proactive in engaging with Network Rail, Train Operators and TfL for greater investment, with some positive wins on Thameslink and the Overground network, but many disappointments as rail investment goes through perpetual “stop-start” cycles.

Inevitably there is investment required to make rail services more operational efficient and reliable now, while accessibility improvements are still needed for many of our stations. We have some of the busiest stations, feeding onto parts of the most overcrowded rail network in the UK. Therefore, we believe that these essential improvements should be promoted where possible from the long term planning to more immediate delivery. Through the NIC we will want to promote our case with Network Rail, Train Operators and the Department for Transport for credible short, medium and long term investment plans that can be delivered.

The Partnership fully supports the Crossrail 2 project and believes that it is essential to enable sub-regional centres in South London to compete effectively in terms of attracting new businesses, employment growth and increased retail trips. Crossrail 2 will bring the economic, social and accessibility benefits that the communities on the initial Crossrail 1 line will shortly be enjoying. In the response to the questions below we consider in more detail the expected benefits, approach to funding and ideas for managing costs.

Working with TfL over recent years we have been developing a Tramlink Strategy and route options for extensions, as annual patronage on the Tramlink network is currently at around 30m, when the network was originally designed for only 20m. It has proved a popular mode of choice and at peak times parts of the network suffer from severe overcrowding equivalent to the peak levels on major Underground lines. When considering priorities for investment Tramlink meets all of the core objectives – it is delivering significant local transport capacity, providing orbital links thereby opening up new growth opportunities and is hugely popular with users.

Tramlink is a prime example of the benefits of local transport infrastructure being enhanced to enable both radial and orbital routes in the sub region. It also highlights that for many of our communities it is local bus services that provide the key links to our metropolitan centres and key towns, as well as linking to employment, education, health,

retail and leisure opportunities. Local buses can easily “fall off the radar” when compared to major investment in road, rail, underground or tram services, but for our sub region it is the dominant form of public transport for many. Investment on bus infrastructure, including segregated routes and greater bus priority, enhanced interchange and modern hybrid or alternative fuelled vehicles, has been a longstanding component of our South London transport strategy.

Cycling is becoming an ever popular mode of transport and is environmentally friendly, brings significant health benefits and reduces congestion. The Mayor has a pan-London target with cycling accounting for 5% of the modal share by 2026. To achieve this goal a significant increase in cycling is needed on current levels across the whole of London and in particular in outer London, where generally the cycle mode share is less than 2%.

South London has the highest dependence on cars, accounting for at least 45% for all journeys made, and due to both to this and its demographics has the largest potential to realistically shift 700,000 journeys from car to bike.

Given the mayoral interest to promote and develop cycling, the Mayor through the TfL Business Plan has made provision for £910m for cycling. In order to secure this funding, sub-regional partnership working with the Boroughs is needed to provide innovative ways to increase the modal share within the sub-region. To this end SLP with the South London Transport Strategy Board was the first sub-region to publish its own cycling proposals (the South London Cycling Charter - December 2012). We believe such strategies can be utilised by the key agencies to identify the optimal investment choices for cycling infrastructure over short, medium and long term and we urge the NIC to include significant levels of new cycling infrastructure in its assessment of London's transport investment needs.

4. Response to the Questions

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

As with all of London and south east England we see meeting the new travel demands arising from unprecedented population growth in South London as the major challenge. We have established a South London Growth Board to ensure that these fundamental issues affecting our sub region are considered in a coordinated and effective approach, always reflecting individual Borough priorities, but also recognising a collective desire for economic growth.

We have for some time been strongly concerned that with the anticipated population growth, if not matched by significant employment growth within our sub region, will accentuate the concentration of new jobs in central London and create even greater pressure on our already constrained radial routes. We recognise that demand for such trips and access to the centre will grow, albeit within increasingly confined physical limits on key rail routes specifically (even with Crossrail 2) and so we continue to make a strong case for what was once described as the “polycentric city”, where our metropolitan centres and key towns equally become the focus for new jobs and transport oriented development, reducing the need for radial trips to central London.

To achieve this goal, change perceptions and travel behaviours we need investment in high capacity orbital links that kick-start both housing and employment growth more evenly across the region. If we do not address this key spatial issue we will continue to have residents of Croydon, for example, more willing to take fast but crowded trains to central London, than choose employment nearer in say Kingston or Bromley, but with a journey three to four times longer on average. Such key differentials in commuting options continue to distort both the employment and housing markets and hamper growth in our sub region. It has long term social impacts and will reinforce the negative outcomes on life choices, health and wellbeing for many of our communities.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

- *How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?*
- *What might their potential impact be on employment, productivity and housing supply in London and the southeast?*

It is perhaps too easy for any community, local authority or businesses to respond to questions such as this with a “shopping list” of schemes and projects which it may have had long term ambitions for, but never secured the funding. In our transport strategy development we have consistently returned to first principles to consider the context, the need, how demand develops and is managed, and then finally what is the infrastructure that is required to meet rigorously tested growth objectives. Through this process we have naturally developed priorities which seek to address the most pressing travel needs, open up development opportunities through enhanced access, change travel patterns to meet new demands and be broadly acceptable to our communities.

To meet such a prioritisation we would therefore expect that our South London partners will support national and London government when it achieves the following transport investment outcomes:

- Capacity, reliability and quality improvements on existing radial routes to central London – to meet planned for jobs growth in the centre and housing growth in our sub region - primarily rail investment by DfT, Network Rail and TfL on the key south west, south eastern and southern lines into London Bridge, Victoria, Waterloo and across London to the north.
- Provide significantly increased capacity on new routes and services into central London – to enable new and existing residents in South London to access employment in central, north, east and west London – which should focus on funding and delivering Crossrail 2 as the highest priority, but also through rail devolution develop new and enhanced Overground and Underground routes.
- Enhance existing and develop new orbital routes linking our metropolitan centres to areas of housing growth – enabling new travel patterns to develop and take pressure off of our key radial routes, enabling greater access to jobs, education, healthcare, retail and leisure, resulting in strong economic growth being spread throughout an

area and not just on radial corridors. This would include suburban rail and South London Metro options, new Overground links, Tramlink extensions, segregated bus corridors, cycle superhighways and Mini Holland type schemes. We would expect to see some new highways capacity developed at key locations, recognising the sensitivity to roadbuilding in our communities.

If such investments were made to deliver projects over the next twenty to thirty years (importantly starting now to plan and develop the projects) we believe we would see a fundamental change in the way that London grows and develops, with a more distributed population, greater economic strength overall and social diversity reflecting the new communities being built in South London. Without such investments all of the South London Boroughs will have to consider how they can meet pan London growth targets and whether they have to effectively discourage population growth unless it is fully matched by complementary investment in access, movement and mobility.

A key issue is programming investment to secure the greatest benefit. We are very conscious of the interdependencies between investments in various areas of infrastructure in terms of delivering optimum levels of development – it is rare that investment in one mode only secures a step change in growth. For example, at Tolworth, while Crossrail 2 is an essential piece of public transport infrastructure which will help facilitate growth in this area of opportunity, there is an associated requirement to improve the A3/A240 road intersection and identify supporting new road arrangements in the area which will help free up space for the required redevelopment. In particular this involves reducing the severance effect that the A3 Trunk Road has on this area. There are number of examples in our sub region where a greater coordinated investment plan will pay considerable dividends in bring forward growth in jobs and homes.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

TfL and Network Rail have engaged with SLP over several years to demonstrate the benefits of the Crossrail 2 scheme and ensure that the transport benefits – offering additional capacity, new route options and higher quality services – are seen as part of the wider leverage of growth opportunities that can be unlocked by major transport investment. Therefore we have reviewed the scheme design options, business case and funding proposals issued to date and at a strategic level recognise the benefits of the current proposed scheme. As always we will wish to delve further into the detail to see how any specific issues of winners and losers occur locally on our stations, routes and timetable, as the project is being developed. However on balance at the moment we believe that the benefits, both transport and non-transport, will probably be maximised with the current scheme and further route extensions or new stations, for example, would only add increasing complexity for marginal benefits.

We have been long standing advocates of the Crossrail 2 regional option, which includes a number of south west branches that would make a significant difference and enable real sustained growth in our Boroughs. Therefore any cost cutting which resulted in the loss of branches or stations, capacity or frequencies would, we believe undermine the viability of the whole project and specifically the benefits to our residents and businesses.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

- *What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?*
- *What innovative funding mechanisms could be considered to support delivery of key schemes?*

We recognise that public sector finances are facing a period of unprecedented austerity and this will have a direct and long lasting impact on transport funding across the UK. While we can seek to harness the interest and funding available from the private sector, whether through development contributions or direct equity investment, we have to assume that the availability of significant public funding for major transport infrastructure is going to be limited.

In such a volatile situation it is therefore important that the promoters of transport infrastructure schemes carefully identify where the user benefits are the greatest and whether there are the funds available or willingness to contribute from each of the key stakeholder groups – residents, transport users and businesses. Seeking funding from all of these groups, or just one, needs to be modelled and tested, in terms of both direct and indirect impacts. At this stage we do not have a view on the right balance between the potential contributors, to either top up or totally fund investment improvements. Our individual Boroughs are likely to have a stronger sense of what is achievable based on their communities, businesses and political views.

An example of this is the funding mechanism for Crossrail 2, which was subject of various studies in 2014 and ongoing development work. We recognise the scale of investment required to deliver the whole of the Crossrail 2 project, but also can see this is outweighed by the major impact on the productivity and economic growth of south London and the city more widely. Crossrail 1 is being funded through a combination of fares revenue, the Business Rate Supplement and Mayoral Community Infrastructure Levy (CIL). It is because of the London wide benefits that we want to press the Mayor and TfL to reflect the Crossrail 1 approach to securing funding from all London Boroughs (and if possible Surrey and Hertfordshire). At this stage to propose funding is drawn from only from the boroughs or developments that directly benefit from the south west to north east routes could be seen as inequitable and could be seen as unacceptable to our communities, businesses and political leadership.

We recognise the call for innovation in funding solutions, but are cautious in recommending an alternative to the current mix of grants, loans and community or business precepts. The experience of the Tubelines PPP, the Metronet PPP and the Tramlink and Docklands PFI schemes, all brought back into TfL control in the last 10 years, is a salutary reminder of the risk of these long term “buy now, pay later” funding options. We do think that there is benefit in revisiting “value capture” or Tax Increment Financing (TIF) type approach (as being used on Nine Elms redevelopment) but again need to see strong evidence that unforeseen impacts on business and economic growth may not occur. If a TIF type funding model was applied to the businesses along the line of the

Crossrail 2 route there is no guarantee all will equally benefit from the scheme or can equally afford to pay for it. Business benefits and economic growth are much more complex to estimate than a simple TIF charge and therefore we will want to be convinced how any alternative to the approach adopted for Crossrail 1 can be more effective and less risky.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

We have not undertaken sufficient research to respond fully to this question, but recognise the value of learning from the experience of cities around the world in terms of funding and delivering transport infrastructure in many innovative and effective processes. We should also recognise the fast pace of change being achieved in devolved local authorities in the north of England and lessons learnt with the devolved governments of Scotland and Wales.

Response to the Infrastructure Commission Call for Evidence October 2015

Streatham Action is a voluntary, non-political group in Streatham informally elected at a public AGM to campaign for improvements to life in Streatham, and sanctioned by, though independent of Lambeth Council. Specialist sub-groups were created in 2015 to deal with subjects that are of the greatest concern to residents, namely Transport and Planning. www.streathamaction.org.uk.

The Streatham Action Transport Group is delighted to have the opportunity to respond to the Infrastructure Commission's Call for Evidence and interest in fresh and innovative perspectives. Our area of interest in this consultation is London's transport system, in particular strategic options for future investment in large-scale transport improvements on road, rail and underground - specifically Crossrail 2 - and the consequences for Streatham and the A23 corridor and future connectivity.

Streatham Action recommends that the Crossrail 2 route map, as it currently stands in the SW London area, be adjusted to one that would omit Balham as a CR2 station, but instead run from Clapham Junction through a new CR2 station at Streatham - which would provide a Southern Rail interchange required in SW London - and on to a reinstated CR2 station approaching from a south-easterly direction at Tooting Broadway. This would provide the vital interchange in SW London with the Northern line.

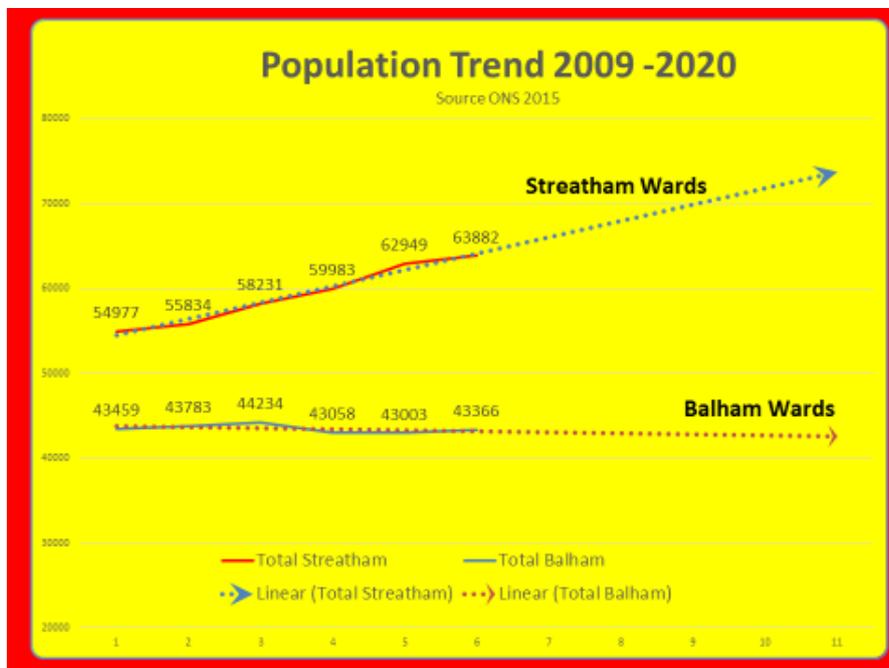
Our group does not have access to all statistics and modelling from TfL, Network Rail or local or national government bodies. However, it seeks to

- Highlight areas in which we believe review and supplementation of work undertaken to date by the GLA and TfL are necessary in order to enable prioritising of the strategic transport challenges faced over the next 20-30 years that may constrain economic growth in the key corridor approaches to London.
- Provide evidence that further investigation of the needs and potential of our geographical area of interest is necessary before priority outcomes for London's future transport infrastructure choices are decided upon, with particular reference to capacity, reliability, journey times, and connectivity
- Highlight that the lack of investment in transport infrastructure in Streatham and the A23 corridor is a gap that continues to lead to failure to tackle existing and prepare for future challenges in order to target desirable outcomes.
- Consider that Crossrail 2 is the only major future transport infrastructure project within 20-30 years that could address the critical transport situation in Streatham, and also has the capacity positively to impact road, rail and underground outcomes in the area and for connectivity London and the south east as a whole.
- Submit that, although already sharing the burden of cost for funding and financing Crossrail1, the Overground, the Northern Line extension, the Bakerloo line extension etc. through Council Tax precepts, residents of Streatham and its hinterland are not benefitting equitably from the benefits of such investment.
- Show that Streatham and the surrounding area has the capacity for economic regeneration in the form of employment, greater productivity, and affordable housing if provided with the necessary transport capacity.

Major economic and social challenges facing London and its commuter hinterland over the next two to three decades

Population growth, with resulting pressures on transport, health, education, and other social infrastructures, as well housing availability and affordability that is driving younger people towards outer areas will continue to put pressure on London and its hinterland.

Our focus is on the key south London corridor with particular reference to Streatham, which has undergone massive and unpredicted population growth of 28% over the last 10 years (ONS 2015). Significantly, since Crossrail 2 considered Streatham as part of any route option around 2011, using data Streatham Action estimates to be from 2009-10 or earlier, population across its four wards has increased on average 16% since then, and the upward trend is projected to continue.



This rate of population growth (16%) is in contrast to that of Balham, which has seen a slight population decline over the same period, but is currently part of Crossrail2's proposed route through south west London. Streatham's growth also outpaces the 9% predicted for Lambeth and 10% for London as a whole over the next 10 years (Lambeth Demography 2015).

Population growth in Streatham has led to a dramatic increase in the demand for public transport, among other infrastructure services, which is evident and manifest in a surge in station usage at all 3 Streatham stations – over 58% since 2009-10 at Streatham station, for example. There has been an increase in footfall at Streatham stations between 2013-14 and 2014-15 alone of 574,868, according to Office of Rail Regulation Entry and Exit Data. Logic dictates that this surge is likely to be a major factor in loading the Northern Line at Balham.

Since 2009-10, when we believe Crossrail2 last considered any option including Streatham, there has been a staggering 92.8% (4,818,096) increase in entries and exits across all Streatham's railway station. See chart below.

The impact of this is plain to see at peak hours with overcrowded trains already at full capacity, and there are no plans whatever in prospect for transport infrastructure improvement for at least another generation. Significantly, for the time period Crossrail2 were most likely using in the assessment of the two options including Streatham, passenger numbers at its stations were declining, thus projections in their modelling may have extrapolated the trend, with inevitable consequences that ruled Streatham out. Streatham Action believes these facts alone demand further investigation by TfL and the GLA into the case for Streatham to be included in Crossrail2.

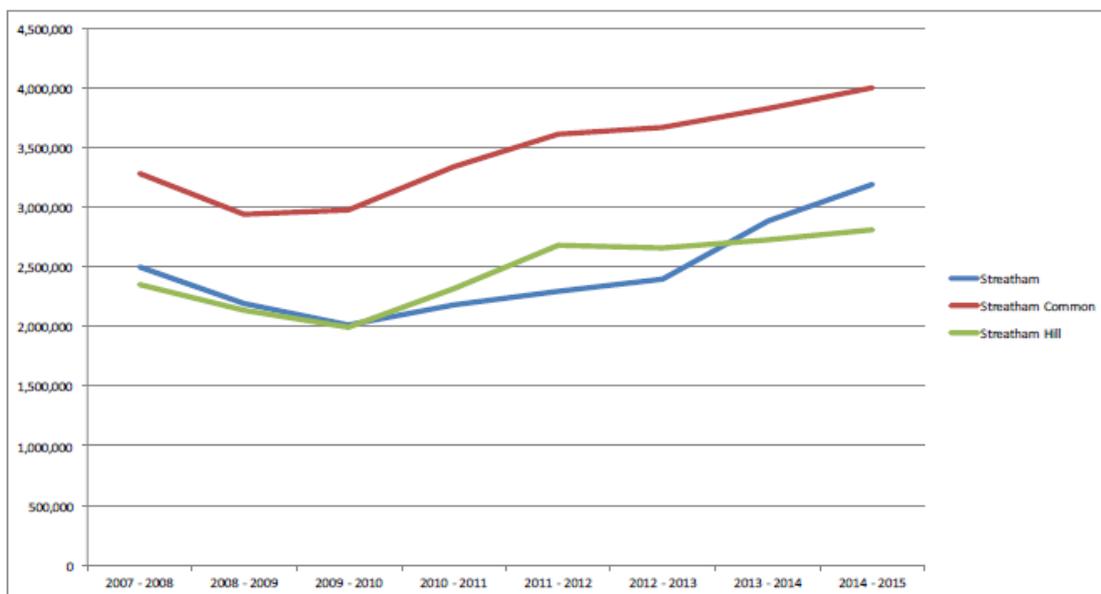
Office of Rail Regulation Entry & Exit Data 2006 – 2015

Office of Rail Regulation Entry & Exit Data 2006 - 2014

	2006 - 2007	2007 - 2008	2008 - 2009	2009 - 2010	2010 - 2011	2011 - 2012	2012 - 2013	2013 - 2014	2014 - 2015	Increase on 13/14
Streatham	1,723,835	2,501,022	2,192,570	2,015,864	2,179,456	2,301,700	2,396,904	2,883,734	3,194,098	310,364
Streatham Common	2,994,714	3,282,824	2,942,892	2,977,568	3,346,078	3,612,564	3,668,806	3,827,296	4,003,938	176,642
Streatham Hill	2,004,200	2,355,874	2,137,376	1,996,690	2,322,980	2,684,506	2,661,068	2,725,320	2,813,182	87,862
TOTAL									10,011,218	

Office of Rail Regulation Interchange Data 2007 - 2014

Streatham	410,372	385,854	342,744	362,370	300,103	307,393	359,329	468,879
Streatham Common	118,345	191,005	175,741	185,217	191,538	161,136	156,635	197,575
Streatham Hill	0	0	0	0	0	0	0	0



Streatham was originally considered for 2 route options by CR2, with the option of a route from Victoria to East Croydon (see chart) and beyond being the route selected for in-depth investigation. Streatham Action has been advised that the inclusion of East Croydon in the route, with its existing rapid direct train services to central London, would have meant that the route including Streatham would have showed only small journey time savings overall. Streatham has never been appraised in the context of the current route through SW London by CR2, to our knowledge.

Underpinning this, however, is the question of why the needs of Streatham (and possibly other areas in London) have been overlooked by transport planners. Identifying and addressing these reasons is key to identifying the most effective strategies for the future.

Crossrail 2 options

“Optioneering” and appraisals 2009-11



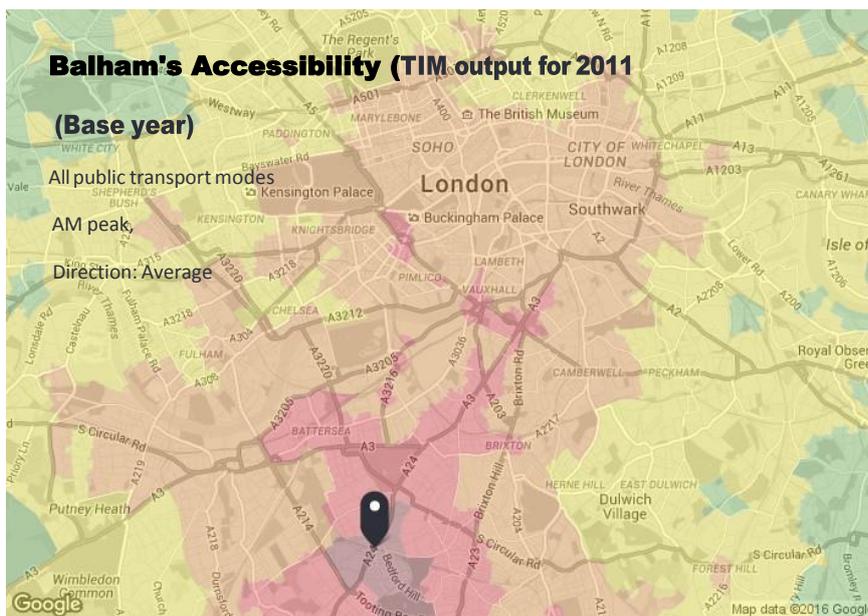

Streatham was assessed >5 years ago for other possible routes but discounted

Public Transport Accessibility Level

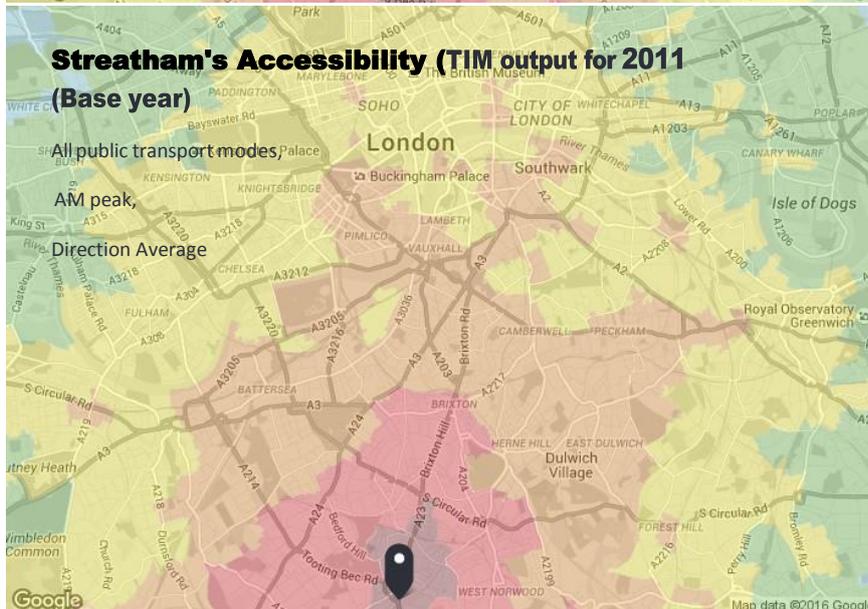
TfL use PTAL as an indicator for the level of accessibility of an area in planning. Areas like Streatham, which has a PTAL score comparable with that of Balham are considered to have high levels of accessibility to public transport. However Streatham relies heavily on buses, meaning journeys are slow and unreliable compared with those from Balham, which has 3 tube stations and 2 railway stations providing fast access to most of central London. PTAL also has no reliability or capacity factor.

It is clear PTAL is a flawed tool for assessing passenger need with public transport provision. PTAL scores public transport accessibility, taking into account walk time to stop, number of services available and the frequency of services, but crucially, does not include destinations and travelling time. Streatham Action urges the use of more sophisticated additional data such as the TfL's new time mapping feature, TIM, which enables planners to map expected travel times when considering

transport improvements such as Crossrail.



TIM maps here reproduced from the TfL website show Balham has superior transport links than Streatham. Most of central London is accessible within 30-45 minutes from Balham, while it is 45-60 minutes from Streatham. This time difference must be weighed in the balance against the value of saving an extra five minutes of time for commuters from outlying London suburbs when considering the logic of including a Streatham station in the Crossrail2 network.



PTAL also determines how much parking must be provided at new developments, with high PTAL scores requiring low parking provision, and vice versa.

“Public Transport Accessibility Levels (PTALs) are used by TfL to produce a consistent London wide public transport access mapping facility to help boroughs with locational planning and assessment of appropriate parking provision by measuring broad public transport accessibility levels. There is evidence that car use reduces as access to public transport (as measured by PTALs) increases. Given the need to avoid over-provision, car parking should reduce as public transport accessibility increases.”

Para 6.43 Mayor of London’s Spatial Development Strategy: The London Plan (2011)

In Streatham, Norbury and the surrounding area, the outcome of this reliance on PTAL scores to determine policy is manifest in full capacity usage at all three railway stations at peak times, one of the most congested and polluted major roads into the capital, the A23, through increased car and bus usage, and street parking at saturation. As long as PTAL alone is used to assess public transport accessibility.

Political Minority Areas

Streatham Action suggests that London Plans should be prepared with ongoing and thorough consultation with local groups and businesses aside from input from Borough Councils better to assess and identify key factors such as population growth and projections and other drivers of investment policy. Streatham has been in economic decline since the 1960s. The political will to investigate and present the case for the area to policy makers has been a frustrating factor. The fact that most of Streatham's councillors have, until recently, not been part of the majority party in Lambeth Council has meant that efforts to investigate and make the case for Streatham to receive the transport improvements it desperately needs have been fragmented by partisan lobbying. As a result, the council's input to the GLA London's Plans has neglected the needs and economic potential of the area. It is possible that this situation is replicated in other parts of London.

Border Areas present hidden opportunities

Streatham lies at the boundary of several boroughs-Lambeth, Wandsworth, Merton, and also Croydon, which means measurement of its needs (in common with those of many "border towns" in London) and benefits of meeting them are fractured by political boundaries which determine the collection and interpretation of statistical information that drives policies. A less boundary-bound consideration of available information – using small area and ward-level statistics to investigate border areas like Streatham would unveil considerable potential for economic regeneration across the Capital which could then be provided with the necessary infrastructure to bear fruit.

Strategic options for future investment in large-scale transport infrastructure improvements in London

A23 Corridor/Streatham High Rd

Access to Gatwick Airport and the Croydon Opportunity Area to and from central London are heavily impacted by this key corridor which of which Streatham High Rd is a part.

Croydon, with London's largest population by borough, is expected to grow by another 15-20% in the next 20 years. As a designated Opportunity Area in the London Plan, it is in process of increasing residential density in the office-dominated central area, with capacity for 7,300 homes. In addition the redevelopment of the Whitgift shopping centre into a modern retail and entertainment hub to serve the region has major implications for transport needs that impact the A23 corridor across road, rail, and potentially underground too.

Streatham falls within the catchment area for the new Whitgift/Westfields Centre, and will be marketed by it to attract customers. There are no plans to upgrade transport links to meet the increased desire to access Croydon from Streatham or anywhere in the A23 corridor. It is inevitable that many of the thousands of new residents in Croydon will put further pressure on transport infrastructure.

In Streatham the A23, which is the responsibility of TfL, has conflicting uses that mean it is unfit for any of its variety of designated purposes. It is Red Route and major arterial road into central London and primary route for many key bus routes, while at the same time it is the centre of one of the major towns in Lambeth with associated shopping, restaurants, entertainment, and offices. As such it is often bustling with people, who are exposed to traffic-associated pollution from what is anecdotally one of the most congested roads in Europe, and whose desire to cross the road at its many junctions means that traffic flow is interrupted by crossings at many points, while historic buildings on either side of the road create traffic pinch points at which the road cannot not be widened to accommodate bus and cycle lanes without the radical destruction of the character of the town centre. TfL's Clean Air for London data indicates traffic flow around the St Leonard's Junction at just under 25,000 vehicles per day with 4.64 tonnes/km of NO2 pollution per year, of which almost half comes from buses. It is also dangerous with regard to road traffic accidents, with 45 deaths or serious injuries associated with the A23 in Streatham over the past 5 years.

Streatham Action can only see a long term strategic solution in tackling the existing conflict in usage. TfL are proposing a radical solution in Croydon at the Five Ways Junction with a controversial flyover scheme, and Streatham Action would like to see a similarly bold approach to solving the A23 problem. A tunnel under the length of Streatham High Rd and through to beyond Norbury (another town centre which has its regeneration potential thwarted by the A23 and poor public transport options) for arterial A23 traffic would allow the High Rd to become a High Street with cycle lanes, a safe environment for pedestrians, and give it capacity to support thriving businesses and a vibrant town centre. A report by the Deputy Mayor for Transport, Isabel Dedring published in 2014 supports the creation of tunnelled roads - the A23 corridor is a prime candidate.

Devolution of Network Rail Controlled Services in South London to TfL Control

Streatham Action fully supports the call by the London Assembly's Transport Committee for control of services currently run by Network Rail franchisees to be passed to TfL. Devolution of Silverlink services in North London to TfL led to the development of TfL's London Overground, according to London Reconnections 2015 report, *Devocalypse Now: Taking Control of South London's Railways*. In the report, Devolving Rail Services to London, the LA Transport Committee specifically target South London rail services to become part of their responsibility, with longer distance services remaining within the remit of the franchise holder.

This would allow South London's rail services to be evaluated for the purpose of serving the needs of London, rather than the objectives of the franchisees whose frame of reference is to make profit from their entire network. As the London Overground has shown, it would allow for effective and practical long term strategies for London's rail network to be created, evaluated, and implemented holistically

Victoria Line Extension – a Streatham Hub with Crossrail2 Current and increasing pressures on rail services outlined above call for an urgent extension to the Victoria Line south of Brixton, through Streatham, Norbury, and Thornton Heath to Croydon. If Gatwick expansion takes place, this will be a necessity. In the current method of prioritising new routes, those locations with existing interchanges with the underground are prioritised over those areas that do not have underground at



all, in the cause of connectivity. This means that without a Crossrail2 station, Streatham may well be a low priority, whereas with one, there is the opportunity to develop Streatham as a transport hub, allowing connectivity with the Wandle Opportunity Area with the new football stadium planned for Wimbledon FC at Plough Lane, Mitcham, and Hackbridge, which

have space and potential for economic regeneration and new homes. "London will only be able to achieve its full potential if its infrastructure is upgraded to cope with the rising population (and) spread the benefits to additional areas of the city..." HM Treasury's Eddington report 13. *London's Infrastructure-Investing For Growth, London First March 2015*

What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

"Right now regeneration areas are absolutely at the bottom of the list in terms of priorities for transport because you prioritise investment where there are congested parts of the network and where people are not able to get onto platforms".. Commented Isabel Dedring, Deputy Mayor for Transport at the London Infrastructure Summit 2015. She continued, "If you have a business case for a scheme that is about regeneration or unlocking housing growth that business case will struggle to get through the internal processes of a transport oriented agency"....

A strategic change in the way transport infrastructure is planned better to prioritise regeneration opportunities would unlock hidden potential across the capital, and the A23 corridor including Streatham, Streatham Vale, Knight's Hill, Norbury, Mitcham Lane, and the A23 corridor through to Croydon is a case in point.

A station at Streatham would unleash great opportunity for regeneration, house building and job creation. The area has a considerable number of sites for new homes, offices, and shops some of which involve a change of use and increased densification. Streatham wards are below the borough

average population density, and subject to local planning policies that encourage the building of new homes in the area. Streatham, a Major Centre in the Lambeth Plan 2015 is identified as having "significant potential for new commercial and residential development....keeping the existing requirement for 50 per cent affordable housing across the borough and providing "support for tall buildings in appropriate locations to deliver regeneration and economic objectives".

London needs 50,000 new homes a year and Savills estate agents have concluded that the bulk of the demand is for homes under 450sq ft., including affordable homes of all types. Streatham is better placed than anywhere along the proposed Crossrail 2 route south of the river to offer sites for such "affordable" development. Foxtons estate agents data shows the average property price in Streatham was £396,838 in March 2015, compared with £700,161 in Balham. As the Lambeth Plan 2015 states, however, "it will not be possible to achieve the significant levels of housing and economic growth set out in the Local Plan without the supporting transport infrastructure required."

The development of Crossrail 1 shows a clear need proactively to integrate housing into the planning for Crossrail 2. This is entirely possible at Streatham Station, with significant acreage available at the site including an open bus standing, Council offices and a currently empty supermarket with 2 floors of parking beneath - a rough guesstimate at 4 acres at ground level and vertical development already sanctioned as 4 storeys and above in the Lambeth Plan. There is also potential in the immediate vicinity with the run-down state of many of the buildings in the area up to the St Leonard's junction on either side of the A23. This should chime with the need for Crossrail to be part funded by the revenue from above station property development at its own sites.

A Streatham Hub station extending behind the current Streatham station westwards towards the intersection of railway lines towards Streatham Common station junction is an ideal location for a Crossrail2 station, as it could provide connectivity with services to Wimbledon, Farringdon/St Pancras/Luton Airport, London Bridge/London Overground, Clapham Junction, Victoria, and East and West Croydon and Gatwick.

Prosperous Balham offers scant further opportunity for economic regeneration compared with Streatham and Tooting Broadway, which both offer significant capacity for retail and office development, job creation, densification and new home building. New homes in Streatham are also likely to be more affordable than in any of the other mooted SW London CR2 station locations.

Streatham station has the capacity to grow to "strategic interchange" status once the CR2 station is located there, but this potential will be wasted for another generation, along with untold billions of pounds worth of economic regeneration potential in this large town in Zone 3, and of the A23 corridor towards the south if it is ignored.

Removing stations in locations in which the majority oppose them in such as Chelsea and Balham is a way to reduce costs for Crossrail 2 in order to fund services into areas that have great need, such as Streatham. At the same time, this would unlock the great potential of the area for regeneration, new homes and new jobs, with benefits spreading as far as the Croydon and Wandle Valley Opportunity Areas.

What are the options for funding, financing and delivery of large-scale transport infrastructure improvements in London, including CR2?

Given that transport infrastructure improvements drive up values of both commercial and residential property both in London and in regions served by them, it is reasonable to charge a percentage of the uplift in value after the scheme has been implemented. This should perhaps be backdated to include areas now benefitting from the London Overground, and should also include

the Northern line extension, Crossrail 1 and HS2. If all of London is paying the same precept towards schemes like Crossrail1, those areas that do not directly benefit are unlikely to be happy to accept funding infrastructure improvements on the same basis as areas that they may perceive as advantaged.

Heavily discounted fares for the elderly, young people and key workers on low wages should apply at off peak times to attract revenue from ticket sales from groups that cannot afford fast transport options.

For road schemes, tolls could potentially fund the construction of tunnels into the Congestion Charge zone.

How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

Streatham Action, as a group of "lay" volunteers, does not have the resources to answer this question in a useful way.

Streatham Action www.streathamaction.org.uk

[Contacts redacted]



CLLR PETER MARTIN
DEPUTY LEADER

National Infrastructure Commission

Sent by email to londonevidence@Infrastructure-Commission.gsi.gov.uk

8 January 2016

Dear Lord Adonis

National Infrastructure Commission: call for evidence

We welcome the opportunity to respond to your call for evidence.

Surrey is a £37 billion economy, an economic powerhouse with a strong, interconnected relationship with London. For an economy like Surrey to function and support London's growth, we need world class infrastructure and investment in Surrey's rail, road and other infrastructure networks.

We have focused our response to your call on Crossrail 2 and the questions you have posed on London's transport infrastructure. Crossrail 2 is an exciting opportunity for Surrey. By releasing capacity on the South West Main Line and providing direct connections from stations in Surrey to Central London, Crossrail 2 will help Surrey and London remain globally competitive and boost productivity.

In recognition of the importance of the scheme, the county council has recently commissioned consultants to undertake an assessment of Crossrail 2. This detailed piece of work, shaped by engagement with stakeholders, is available to download at www.surreycc.gov.uk/surreyrailstrategy. The responses to your questions (see attached annex) have been considered relative to the Assessment and we hope that this detailed study will inform your own analysis.

Although your questions are focused on Crossrail 2, we have also provided evidence on further infrastructure schemes which should be considered as part of the solution to London's transport challenges. These challenges can best be met by both improving connectivity to London but also ensuring that there is investment in infrastructure that will serve to release pressure on London's transport network.

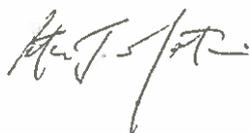
Where relevant we have highlighted links to further analysis including detailed work on the North Downs Line and A3. Our assessment of these schemes highlights that infrastructure investment could play a key role in achieving balanced growth across the South East.

In assessing priorities for investment and reaching agreement on how schemes are funded it

is important that London and the South East work together to define and promote a programme of cross-boundary transport investment that will provide mutual benefits.

Please do not hesitate to contact me should you require any further information.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Peter Martin', written in a cursive style.

Peter Martin
Deputy Leader of the Council and Cabinet Lead for Economic Prosperity

Annex 1: Questions posed by the National Infrastructure Commission on London's transport infrastructure:

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

Surrey is a strong economy which shares many of the economic and social challenges that London faces. Surrey is a £37 billion economic powerhouse. It is the largest sub-regional economy in the South East and is the only county with two international airports on its borders, presenting both opportunities and challenges.

Like London, Surrey is home to many international business headquarters, a highly skilled workforce and an innovative business base. The Surrey and London economies are both similar and interlinked. Over 130,000 Surrey residents commute into London daily, with some 66,000 coming from London into Surrey.

The demands of population growth and a strong economy place an obvious pressure on the county's infrastructure, notably the rail network which is struggling to meet current demand. Four Surrey train services are amongst the most overcrowded in the country (two of these on the South West Main Line) and forecast growth is expected to further exacerbate the pressure on Surrey's transport network.

Surrey's motorways carry 80 percent more traffic than the average for the region and the A roads 66 percent more traffic than the national average. Many of Surrey's roads already operate at capacity. If a traffic incident occurs, this can cause severe disruption on the wider network.

Surrey is also facing similar demographic challenges to London. By 2030 Surrey's population is predicted to increase by 12% (based on ONS figures). The largest proportionate increase in age categories will be those aged over 60, with the proportion aged over 85 rising most steeply.

Surrey's infrastructure is struggling to cope with these challenges and investment is needed now and over the long term to alleviate these pressures.

Through the Surrey Infrastructure Study we have sought to quantify Surrey's infrastructure deficit. The Study highlights the range of infrastructure needed to support growth. This detailed piece of work, which includes transport infrastructure, utility networks and flood protection should inform your own analysis and serve to highlight the interconnected challenges faced by the London and Surrey economies.

In terms of Crossrail 2, we fully support the case being made for the scheme which recognises that this new railway needs to serve the most productive and competitive parts of the UK economy including supporting employment and housing growth outside London.

The Crossrail 2 Assessment we have commissioned includes a detailed planning and economic baseline which sets out spatial and economic analysis along the proposed route. The Assessment is available to download at www.surreycc.gov.uk/surreyrailstrategy.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

- **How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?**
- **What might their potential impact be on employment, productivity and housing supply in London and the south-east?**

Context

The county council has undertaken considerable work on the large-scale transport infrastructure needed to support economic growth in the county and wider region.

Three priority options were identified in the Surrey Rail Strategy (September 2013):

- Capacity on the South West Main Line (SWML), including the Crossrail 2 scheme;
- Local orbital rail services, namely the North Downs Line; and
- Access to airports – examined in the Surrey Rail Strategy: Surface Access to Airports study (October 2013).

These interventions were identified because of their key role in meeting our rail development objectives:

1. Maintain global competitiveness
2. Drive economic growth
3. Reduce impacts on the environment
4. Accommodate sustainable population growth.

Whilst our focus in this response is Crossrail 2, all three options should be prioritised for future investment because of their ability to meet these development objectives and drive economic growth in London and the South East.

In addition to this further investment is needed on Surrey's strategic road network, notably the A3 and M25. Investment on these roads would impact positively on regional productivity and support the labour market in both London and Surrey.

The need for investment in the region's strategic road network has been recognised by Enterprise M3, Coast to Capital, Solent and Thames Valley Berkshire Local Enterprise Partnerships, who have appointed consultants to identify, describe and quantify the economic case for improving connectivity in major strategic movement corridors across South East England (the Influencing Strategic Transport in the South East Study). The study will be made available to the National Infrastructure Commission once complete (at the end of January 2016).

Surrey County Council is working closely with the LEPs on this study. Given its strategic importance to the region the upgrade of the A3 between M25 Junction 10 and Portsmouth has been selected as a test corridor for the study.

Crossrail 2

Services along the SWML are already amongst the most overcrowded in the country notwithstanding the forecast rail growth of 40% by 2043. On suburban lines some

passengers are already unable to board the busier trains. Demand on these services is also forecast to increase by 40% by 2043.

We must take steps now to ensure that rail services and capacity are improved for our residents. Crossrail 2 is key to achieving these aims.

In the short term, Network Rail and South West Trains are addressing this challenge through small-scale capacity enhancements and train lengthening. This is welcome but a longer term solution is needed.

Crossrail 2 has the potential to benefit Surrey in two ways. It will provide:

1. New direct Crossrail 2 services, cutting journey times and improving connections to Central London, and
2. Additional longer distance services on the SWML providing additional capacity into Waterloo and reducing journey times.

Crossrail 2 will provide direct connectivity from Surrey to areas in Central London that currently require interchange. This direct connection will enable shorter journeys for many passengers, supporting the London and regional labour market. The Crossrail 2 Assessment has examined the proposed Crossrail 2 routes and also considered other potential route options.

The real benefit for much of Surrey will be through the additional capacity and crowding relief for services into London Waterloo. Additional train paths on the SWML could be used for additional long distance and/ or for shorter distance services. The Crossrail 2 Assessment sets out analysis of where this capacity would be of particular benefit for communities in Surrey, supporting economic growth and potentially encouraging housing supply.

Other infrastructure

Crossrail 2 is a key priority for the county council but there are other strategic schemes, equally transformative, which would strengthen the Surrey, regional and London economy. These include:

- The modernisation of the North Downs Line
- Improving access to airports
- Improvements on the A3 corridor and strategic road network.

These interventions, summarised below, recognise the need for balanced growth across the South East. London's strategic transport challenges can best be met by both improving connectivity to London but also ensuring that there is investment in infrastructure that will serve to release pressure on London's transport network.

Modernisation of the North Downs Line

The North Downs Line runs through Surrey, Hampshire and Berkshire between Reading, Guildford and Redhill. The line forms an important orbital route to the south and west of London, with connections to the capital.

The potential of this line is currently constrained by poor journey times and service frequencies. This has been recognised by Network Rail in the Wessex Route Study which proposes a much needed increase in service frequency.

There is a good economic and strategic case for investing in improvements along this line. Significantly, by providing an alternative route option around the capital, investment along

this corridor could free up much needed capacity in Central London by diverting passengers away from the capital.

Further, the catchment area along the corridor could play a critical role in achieving balanced growth in the South East. Population and employment is expected to grow strongly along the line, helped by major employment and housing developments.

We urge you to review Surrey County Council's assessment of the North Downs Line which outlines a long term vision for this corridor. This vision involves a series of improvements, driving economic growth at key strategic locations. In the short-medium term we are seeking:

- Investment at Guildford Station to increase platform capacity;
- Re-signalling and careful timetabling to maximise peak time travel opportunities;
- The extension of services beyond Reading to Oxford;
- The potential electrification of the remaining stretches of the line.

The detailed assessment can be found at www.surreycc.gov.uk/surreyrailstrategy.

Improvements on the A3 corridor

The A3 is an important strategic corridor linking Portsmouth and London. It is already significantly congested and this congestion is predicted to get worse. The A3 goes through Guildford, Surrey's largest employment centre and directly past Surrey Research Park. The research park is a nationally significant centre of excellence for technology, science, health and engineering and contributes £350 - £450 million to the economy annually.

Surrey County Council, Woking Borough Council and Guildford Borough Council completed a high level impact assessment of the A3 in the summer 2015. A summary of this study can be found in the attached A3 connectivity lobbying note.

The work on the A3 is being further taken forward through two strategic studies – the M25 South West Quadrant Strategic Study and the Influencing Strategic Transport in the South East Study (as noted above).

Improving journeys to Heathrow and Gatwick Airports along with the creation of additional runway capacity

The county council commissioned a study to examine the transport infrastructure improvements needed to address both existing surface access issues to the airports and the improvements needed to regional and local links in the event of additional runway capacity at Heathrow and/or Gatwick.

Amongst the options identified are a future direct rail access solution to Heathrow Airport from Surrey and ensuring medium term improvements to the North Downs Rail Line (as highlighted above). Improving these links will support both the Surrey and London economies.

Looking specifically at Heathrow, whilst rail access is relatively good from West London and the wider London area, from the south, including most areas of Surrey, there is little viable alternative to travelling to Heathrow Airport by car. Travel by car (47%) is the dominant mode for trips to Heathrow from Surrey, followed by taxi (38%). A significant number of Heathrow employees are also resident in Surrey, with over 80% travelling by car. Enhancement of public transport access to the airport from the south is therefore vital to improve connectivity to Heathrow for airport users and staff and to help mitigate congestion, achieve modal shift and minimise detrimental impacts on the local economy.

Whilst we support the principle of improved southern rail access, the optimal scheme for Surrey's residents or for that matter the residents of South East England as a whole, has yet to be identified. To this end we await the publication of Network Rail's study of the case and options for a southern rail access.

As part of this it is essential that the Government, Network Rail and other bodies are fully committed to funding the core and extended baseline of strategic road and rail improvements identified by the Airports Commission as needed to accommodate background demand in the absence of any new runway at either Heathrow or Gatwick to avoid unacceptable traffic congestion and overcrowding on train services. The funding of improved surface transport access to support airport expansion needs to be agreed up front whether it comes from Government, the airport owners or other agencies or in combination. There is therefore a need for binding commitments to fund related surface access enhancements through national and sub-regional programmes.

Our experience of the implementation of the T5 development proposals, however, indicates that if the components of the proposed surface access strategy are not formally agreed and secured through binding commitments, opportunities can be missed.

A copy of the Surface Access to Airports Study and the detailed analysis that accompanies it are available to download at <http://www.surreycc.gov.uk/environment-housing-and-planning/development-in-surrey/surrey-future/airports>.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

In recognition of the importance of Crossrail 2 to the Surrey economy the county council has recently commissioned an assessment of Crossrail 2, the objectives being to:

- Identify the optimum configuration of Crossrail 2 services for Surrey and the best use of released capacity; and
- Provide an evidence base for use when providing input and response to the Crossrail 2 design development and subsequent consultation process.

In identifying the optimum configuration of services, the assessment highlights opportunities to increase the benefits of the scheme and we urge you to review this report.

In terms of released capacity, additional station calls for fast trains at Guildford and Woking would serve existing demand at these stations (Surrey's busiest) and support growth forecasts. We also suggest new service calls at Byfleet and New Haw and Walton-on-Thames on the SWML and new services along the Alton Line because of growth potential along this corridor.

In terms of direct connections, we support the current proposals for Crossrail 2 connections in Surrey. Partly in recognition of growth potential we have asked Network Rail/ Transport for London to investigate the operational feasibility of an extended service beyond Epsom to Dorking and the operational implications of a service to Woking. Woking is a key economic centre in Surrey and a potential future rail hub. In addition, Woking could potentially be a key origin/ destination station for southern rail access to Heathrow Airport, which could lead to a range of growth opportunities being realised.

The full analysis is available to download at www.surreycc.gov.uk/surreyrailstrategy.

Supporting infrastructure

Additional supporting infrastructure is vital to ensure that the benefits of Crossrail 2 connectivity are fully realised. Public transport improvements will be needed to provide access to the stations benefiting from direct connections or increased capacity, particularly if we are to avoid an unsustainable increase in the demand for parking around stations. Parking is already a problem in some areas along the proposed route.

In addition to this we must recognise now and plan for the transport impact of the associated housing that Crossrail 2 will encourage. Whilst the aim would be to encourage as much travel as possible by rail, this will generally only serve a relatively small percentage of the overall travel demand from any new housing. Detailed Transport Assessments will need to be undertaken for any housing proposals that might be associated with Crossrail 2.

Other infrastructure will also be needed to support any additional development encouraged by improved connectivity. This includes the social, community and other services provided by the county council, notably education.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

- **What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?**
- **What innovative funding mechanisms could be considered to support delivery of key schemes?**

London and the South East should work together to define and promote a programme of cross - boundary transport investment that will provide mutual benefits.

You will be aware that Surrey, West Sussex and East Sussex have put forward an ambitious '3SC' devolution proposition of which a central element is to complete the infrastructure studies underway across the 3SC area and develop them into a prioritised programme around which investment and local planning arrangements can be structured. The intention is then to develop a comprehensive infrastructure strategy (and accompanying fund) to 2050 to provide a planned and prioritised investment roadmap for the area linking the delivery of infrastructure with the delivery of housing and employment sites.

We will be seeking some additional fiscal devolution as well as the ability to make better use of existing national and local funding. In combination these devolution proposals offer the means to do far more to secure the delivery of the local infrastructure needed in the area and including that needed to support major interventions such as Crossrail 2

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

No comments

National Infrastructure Commission: critical infrastructure challenges

Sustrans' submission on London's transport infrastructure

January 2016

Summary

Sustrans is a leading UK charity enabling people to travel by foot, bike or public transport for more of the journeys we make every day. We welcome the opportunity to respond to the National Infrastructure Commission's call for evidence on London's Transport Infrastructure. We are also responding to the Commission's call on Northern Connectivity.

Many of the apparent challenges facing London, northern cities and cities across England are similar in nature. Infrastructure investment can support the local and regional authorities in tackling them.

For London, improving economic productivity, maintaining competitiveness, protecting our environment and improving public health are key challenges faced by the city. Meeting these challenges is made more difficult by London's projected population growth, which will increase pressures on space, services and transport. Sustrans has ruled out increasing motor-traffic capacity as a strategic option due to its impact on congestion, public health and quality of life.

Sustrans consider that strategic options for investment include:

- modernising London's roads to cater for increasing demand from walking and cycling and to unlock suppressed demand for sustainable modes – improving the efficiency of the road network and its impact on quality of life;
- overcoming strategic barriers to walking and cycling, including major roads, railways and rivers – barriers that sever communities and economic opportunities (this includes specific proposals for a new bike bridge across the Thames); and
- integrating major public transport investment with improvements to cycling and walking connectivity.

This approach would help unlock a potential 4.3 million journeys (roughly 20% of all daily journeys) that could be cycled in London, alleviating significant pressure on London's roads, buses and railways, and lead to a significant shift in the number of journeys made by foot. Improving quality of life through modernising London's roads – catering for and unlocking walking and cycling - will be key to maintaining London's global competitiveness and its contribution to the national economy.

What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

The major economic and social challenges that face London over the next two to three decades are economic, social and environmental. They include:

Improving economic productivity – and maintaining competitiveness

- Ensuring that journey times do not deteriorate under the pressure of population and employment growth
- Reducing absenteeism from work against a backdrop of increasing sedentary, inactive lifestyles and rising obesity
- Managing congestion and competing demands for London's road space – both are critical to London's ability to attract investment and provide a good quality of life

Improving Public Health

- To dramatically reduce the number of people killed and seriously injured on London's roads
- To reduce air pollution and its impact on Londoners health - researchers at King's College London estimate air pollutants (particulate matter and NO₂) contribute to the deaths of nearly 9,500 people each year¹
- To improve physical activity levels through walking and cycling, helping to tackle a range of non-communicable diseases and obesity, reducing the burden on the health care system

Protecting our environment

- To reduce London's contribution to climate change

Meeting these challenges against a backdrop of rapid population growth

Each of the challenges above will be made more difficult by population growth. The result of growth will be to place ever greater demand on services, green space, infrastructure and the environment.

The population of London was 8.3 million in 2012.² By 2021, the Office for National Statistics project that the population of London will reach over 9 million, growing at a rate of 117,000 new residents per annum.³

Without action to plan and cater for this growth, London will struggle to maintain a good quality of life for its citizens – let alone improve it. Similarly, increasing pressure on public transport and roads will hold back the capital's productivity growth and its contribution to the national economy and global competitiveness.

Active travel (walking and cycling) can provide a significant contribution to overcoming these challenges. It has the potential to rival other forms of mass transit if catered for strategically.

Transport for London undertook analysis in 2010 to understand the potential contribution of cycling to meeting London's travel demand, looking at the short trips Londoners make during the day and without bulky loads. It identified 4.3 million journeys that are made by mechanised modes each day, such as by car, powered two-wheeler, bus or rail, that could be cycled. This represents a 23% share of trips made in London.⁴ Despite substantial recent growth cycling currently makes up just 2%.⁵ This stark contrast between the reality today and London's potential highlights the contribution cycling can make if catered for by road infrastructure.

Having recognised this potential and set a target of 1.5 million trips per day by bike, the Mayor of London is investing roughly a quarter (£913 million) of the £4 billion Roads Modernisation plan in creating a cycling network of the standard required to enable everyday cycling. Transport for

London calculated an overall benefit-cost ratio of 2.9:1 for this cycling investment.⁶ With further investment, London could cater for the 4.3 million journeys identified in the 2010 study. Maintaining long-term investment in improving road infrastructure for cycling, and also walking, over the next two to three decades will make a major contribution to meeting the major economic, social and environmental challenges outlined above.

What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

Directly increasing the road network is unsustainable

It is widely recognised that increasing road capacity generates more traffic, particularly in urban areas where congestion suppresses demand.⁷ The temporary benefits of a wider road and smoother traffic flow result in diverted journeys (people shifting their trips in time or route to make use of the new capacity) or induced travel (longer trips becoming more acceptable with better conditions on the road). This effect increases overall traffic levels, and increases it during peak periods until congestion returns to its original levels. The effect of this is to worsen congestion at other points on the network with no improvement to journey times or reliability.

When a second bore of the Blackwall Tunnel opened in 1966, traffic increased by over 100% – more than double the original use.⁸ The effect on congestion was negligible, as drivers who had previously avoided the route, driven at other times or not driven at all, quickly made use of the newly available space returning congestion to its original state.

That motor traffic grows because of increases in road capacity has been recognised since at least the SACTRA report on Trunk Roads and the Generation of Traffic in 1994.⁹ This report was released after almost a decade of road improvement projects that failed to reduce congestion - despite that being their objective. Increasing road capacity in London will have major negative effects, including:

- increasing the volume of traffic – resulting in deteriorating air quality, increased road danger and the severance of communities
- expediting congestion to other parts of the road network – generating new air pollution hot spots
- encouraging mode shift to private motor vehicles from public transport, walking or cycling or generating new trips entirely – reducing the efficiency of roads

It is important to note that average car ownership in London is much lower than elsewhere in the country. As the population has grown over the past decade, traffic levels have continued to decline (see figure 1). This is the result of significant and sustained investment in providing Londoners with travel choices: public transport, cycling and walking alongside constraints on private motor travel.

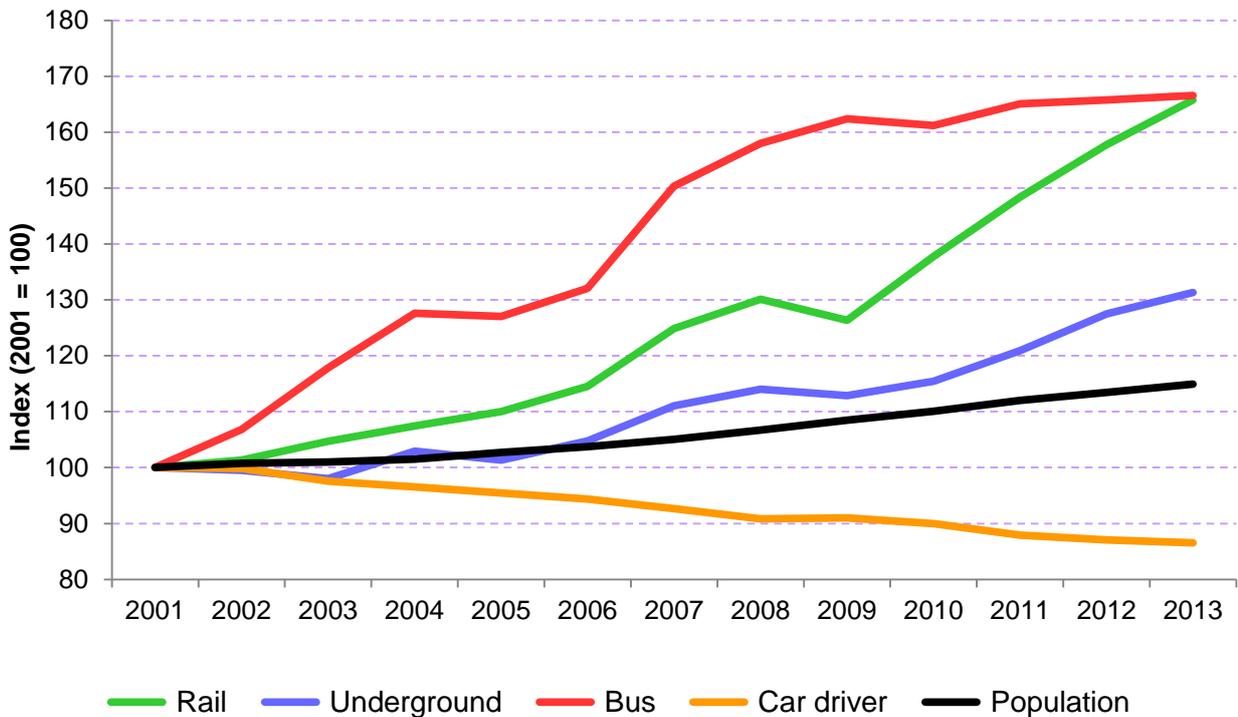


Figure 1: growth in journey stages on selected modes, 2001-2013 (Transport for London Travel in London 7)

There are a number of proposals to build new road capacity in London. Sustrans is firmly of the view that this will harm London’s economy, not grow it – increasing congestion, air pollution and road danger, damaging London’s productivity and quality of life.

Maximise the efficiency of the existing road network through walking and cycling

The majority of journeys are of walking and cycling distance, improving road infrastructure for these modes would make London’s road infrastructure much more efficient.

The way Londoners travel has changed dramatically over the past two decades but more needs to be done to continue this trend. The densification of London, particularly inner London, means that investment in a diverse range of non-car transport options has become viable, the range and quality of public transport pulling people to use non-car modes. Meanwhile congestion, the cost of motoring, restrictive parking policies and mix-use development has pushed people away from car use.

The scale of change is substantial. Department for Transport data shows that in 2013 private vehicle use in London reached its lowest point since 1993.¹⁰ Since 2000 there has been a ten percentage point shift away from private transport to walking, cycling and public transport. This has occurred against a background of a population that has grown every year since 1988, accelerating from the mid-1990s onwards.¹¹ The volume of road traffic in London has decreased 11% since 2001. Car driver trips are 13% lower, despite a 15% increase in London’s population over the same period.¹² The scale of change shows what can be achieved when policy and strategic infrastructure investment are aligned.

Cycling has grown dramatically and will continue to grow in future. Twice as many people are now cycling in London than in 2000. More people cycle now than use the Docklands Light Railway and London Overground combined.¹³ There was a 10% increase in cycling between 2013 and 2014 alone.¹⁴

The Transport for London study, mentioned earlier, identified 4.3 million journeys that are made by mechanised modes, but could be cycled. This represents a substantial 23% of the total 18.5 million journeys a day.¹⁵ While cycling has grown dramatically, particularly for commuting to central

London, it still makes up only 2% of journeys across Greater London.¹⁶ This potential remains largely untapped.

Walking is strategically important for London. At some point in a journey, everyone walks. Walk-all-the-way trips have grown in line with population growth. The increase in trips entirely made by foot from 2008 – 2013 was 9.3% - the same increase as population growth over the same period.¹⁷ However, short walking stages, as part of trips by public transport, have grown dramatically from around 2.8 million in 2006/7 to 4.2 million in 2012/13. Walking provides the link between all other modes as well as a key means to make local trips, but with a growing population the walking environment will deteriorate without sustained investment. In turn this may impact London's competitiveness as a place that attracts skilled labour and investment.

Active Travel (walking and cycling) has the potential to rival other forms of mass transit if catered for strategically. Sustrans consider there to be three routes to achieve this; each of which requires infrastructure investment.

1. A strategic network of cycle routes

Many complete journeys (door-to-door) could be made by bicycle - particularly those commuting within inner and central London, where the journey distances are easily cycled. According to TfL only 14% of cycling potential has been met in central London and 9 per cent in inner London.¹⁸ The Infrastructure Commission should recognise the important contribution to travel in London that cycling could make given the right road infrastructure conditions. Hence, the need for continued investment in a strategic cycle network, which provides safe and direct routes between homes, jobs and services. Major transport projects, such as Crossrail and Crossrail 2, should integrate with the cycle network and provide opportunities to expand and contribute positively to it.

Investment in new road infrastructure that is good for cycling is popular. Recent consultations by Transport for London and London Boroughs, for example, have drawn an overwhelming number of supportive responses. The most high-profile, "East – West Cycle Superhighway", on the Embankment received nearly 14,500 responses with a support rate of 84%.¹⁹ In an independent poll by YouGov, 64% of Londoners supported removing traffic lanes for cycle superhighways.²⁰

A strategic network of cycle routes is a vital ingredient to meet London's future challenges. The creation of a safe and direct network for cycling should be a goal of investment in London's road infrastructure over coming decades.

2. Overcoming strategic barriers to local journeys - including east London river crossings

Road, rail and water present obstacles to movement – they sever communities and create longer, more circuitous journeys than the crow flies. Journeys are concentrated onto bridges and tunnels available, which, for people on foot or on bikes, often means sharing with high volumes of traffic. Consequently, they are danger hot spots with poor air quality. Providing strategic crossings for walking and cycling can unlock suppressed demand by providing advantageous journey times to other modes and a much more pleasant environment to travel in. This improves local journeys times and quality of life, through healthier journeys and better places.

2.1. A new bike bridge for London: improving connectivity to jobs and cross-river journey times

As the Commission will be well aware, the river Thames presents a major barrier to development in east London. Crossings are few and far between compared to west London. For the crossings between south London and the Isle of Dogs there is a specific existing demand that far exceeds capacity.

This demand will only increase. Over the next two decades at least 110,000 new jobs will be created on the Isle of Dogs and at least 4,000 new homes will be built immediately across the river at Canada Water.²¹ Furthermore, major growth is planned around six 'Opportunity Areas' in south London within close cycling distance of the Isle of Dogs and its growing job opportunities.

In 2008, Sustrans proposed a new bike bridge between Rotherhithe and the Isle of Dogs. The bridge is highlighted in HM Treasury's National Infrastructure Plan. Described as, "[a]n interesting proposal made by Sustrans, and worth looking at in more detail, would be a new pedestrian and cycle bridge from Rotherhithe to Canary Wharf."²²

With support from Transport for London and local businesses, we revisited the case for a bridge in this location in 2015. Using an example design, our feasibility study and outline business case analysis suggested a likely benefit-cost ratio of 2.6:1 with a base cost of approximately £88 million. Further development work is needed to identify the detailed business case and feasibility (further information is presented overleaf).

Providing cross-river connectivity in east London is vital and a walking and cycling bridge between the Isle of Dogs and Canada water could make a nationally significant contribution between strategically important development sites for new homes and jobs in London.

3. Integrating walking and cycling with public transport

Major public transport schemes, such as Crossrail and Crossrail 2, have the potential to dramatically increase rail capacity in London unlocking new housing sites and new areas of focus for employment growth while potentially alleviating pressure on national rail services. However, the benefits of these projects will be limited in scope if they fail to unlock local walking and cycling potential. Providing accessible walking and cycling links to stations, as well as interchange facilities – such as cycle parking – will ensure that new or improved stations benefit the largest catchment area possible.

How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?

The criteria for the prioritisation of schemes should be weighted according to the strategic challenges set out in response to the first question and to what extent they tackle the challenges. Importantly, the environmental and social impacts should be considered with equal weighting to economic impacts.

Significant priority should be placed on maximising the efficiency of the road network – particularly through providing infrastructure for cycling and walking for short journeys, where there is significant potential. Through a strategic cycle network, greater capacity is provided for short trips from London's finite road space.

Cycles are able to make much more efficient use of road capacity. While a car occupies one passenger car unit (PCU) of road space to convey on average 1.3 people, a bicycle occupies 0.2 PCU to convey one person. In other words, a cycle uses a fifth of the space of a car to transport the same number of people. Transport modelling in the Netherlands suggested that given the same space, buses could convey 9,000 people per hour, while cycles could convey 14,000.²³

With London's population continuing to increase, the space efficiency of road based transport schemes should be a major consideration for their prioritisation. It should also take into account the flexibility and resilience of walking and cycling to disruptive events.

What might their potential impact be on employment, productivity and housing supply in London and the southeast?

1. Strategic Cycle Network

Increasing productivity through quicker journey times: for many short journeys in London, cycling is the fastest mode of travel. TfL have estimated a daily value of time saved if the Mayor's cycling target is reached to be in the order of £530,000 a day or £190 million a year.

Increased spending power: cycling is the cheapest mode of travel after walking. TfL estimate that those who will cycle regularly in London as a result of investment in the cycling network will collectively save £190 million per year.²⁴

Increasing productivity by improving health: People who cycle regularly take 1.3 fewer sick days than those who don't. TfL have calculated that reaching the Mayor's current cycle target of 1.5 million cycle journeys per day will provide £30 million in savings to businesses each year, through increased productivity. Reducing mortality through exercise (physical activity) as a result of 1.5 million cycle journeys in London is estimated to save the NHS, care services and others £183 million each year.²⁵

2. A new bike bridge for London: improving connectivity to jobs and cross river journey times

Sustrans' work on the development of a feasibility study and outline business case for a cycling and walking bridge between Rotherhithe and Canary Wharf has highlighted that a bridge in this location would:

Provide a significant contribution to active travel in London, connecting new homes and new jobs

- Cater for at least 10,200 cycle trips per day – the equivalent capacity of 10 full Jubilee line trains or 127 buses
- Cater for 3,400 cycle crossings during the AM peak – as busy as other central London bridges for cyclists
- Put the growing population of the Rotherhithe peninsula within walking distance of the Isle of Dogs

Have far reaching benefits

- Reduce crowding on the Jubilee Line – currently at the highest measure of crowding during the AM peak (over 4 people per square meter) between Waterloo and Canary Wharf²⁶
- Uplift land values in the surrounding area by c10% according to previous examples
- Negligible emissions

Provide value-for-money

- Monetised benefits circa £10 million per annum, including journey time savings of £7.9 million
- Full project cost c£200m
- Benefit-cost ratio c2.6:1
- Buildable by 2020, following a full and transparent procurement process

3. Maximising walking and cycling benefits through Public Transport

3.1. 'Cycle-proof' new stations, railways and above-station developments: 'cycle - proofing' involves ensuring that structures, buildings and streets are safe and attractive for cycling. Public Transport works should improve cycle and pedestrian access to and from stations within the catchment area (approx. 5km), and enhance permeability through the site. Provide interchange facilities, such as cycle parking, for cycles of all types (including non-standard cycles, such as hand-cycles or tricycles) to cater for growth in mode share and a diversity of users. Overcome local barriers to cycling, including major junctions or physical severance caused by road, rail or waterways. Crossrail delivery should include the redesign of such junctions, and construction of new infrastructure to overcome severance such as bridges or new crossings.

3.2. Increasing housing supply through cycling: the current Public Transport Accessibility Levels (PTALs) tool provides the framework for maximum housing densities in London. Overcoming barriers to walking will improve the transport accessibility rating of areas and therefore increase their potential contribution to housing supply. PTALs do not currently include cycling access. As a general rule, including cycling in accessibility scores will increase the accessibility of an area and thus its potential housing supply. For the scores to reflect the reality, however, the developers should improve the cycling connections to and from their site, without which any modifications to accessibility scoring to take account of cycling may not be a fair reflection of perceived accessibility by bicycle. Ensuring new developments – particularly those linked to new transport, such as those unlocked by Crossrail 2 – should address barriers to walking and cycling in and around the sites. This will improve transport accessibility and thus increase potential housing supply in the surrounding area.

What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Maximising the benefits by prioritising cycle connectivity

The planning and construction of Crossrail 2 is an opportunity to offer door to door sustainable travel options for the growing London population. Central to this will be the connectivity for cycles and pedestrians to and from stations and through the sites. To make the most of this opportunity, the Crossrail 2 project must be an exemplar of integrated and accessible station design and master-planning, particularly focussed around walking and cycling.

By actively improving local cycle connectivity, Crossrail services will become more accessible across a larger area, improving the catchment area and thus likely ridership of the scheme.

What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

- What innovative funding mechanisms could be considered to support delivery of key schemes?

Vehicle Excise Duty: In the spring budget, the chancellor announced that he would be engaging devolved administrations on the allocation of revenue derived from Vehicle Excise Duty. There is

likely a large contribution that can be made to Transport for London in general, or on a scheme by scheme basis, from vehicle excise duty contributions in London.

Mayoral Community Infrastructure Levy: The Mayoral Community Infrastructure Levy (MCIL) was established to contribute toward the cost of Crossrail. Together with the section 106 agreement, development in London is expected to contribute c£600 million to the c£15 billion cost of Crossrail through MCIL. Sustrans consider that the MCIL should be utilised to improve walking and cycling access to new development sites and new Crossrail and Crossrail 2 stations.

Ensuring developments provide high quality walking and cycling links: swathes of London will be unlocked for development as a result of Crossrail 2 and other strategic public transport projects. With developments carrying out master planning and street works as part of their developments, ensuring that they deliver a high quality of design for walking and cycling will be a key means to add-value to London's accessibility and connectivity. The London Plan provides a good policy framework for this to take place and the GLA and Transport for London are equipped with the skills and expertise to provide best-practice guidance. Planning frameworks surrounding Crossrail stations should prioritise improvements to local streets for walking and cycling as part of their development. This would add value to Crossrail stations and development sites without extra cost.

How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

Many global cities are taking bold steps toward more sustainable transport systems. Of those cities with similar populations, Paris and New York are developing strategic cycle networks, while also creating new public spaces from their roads.

- The New York City Bicycle Masterplan outlines 900 miles of planned network. Cycle commuting in New York is on course to have tripled over the ten years from 2007 to 2017. The exemplary project of new public space is Times Square. It is now a bustling pedestrian plaza where it had previously been a car dominated interchange.
- Paris has similar aspirations to triple the share of trips by bicycle by 2020 – to 15% share of trips, enabled by a 1,400km network of routes by 2020. A number of new public spaces have been created from traffic interchanges, most famously La Republique, which is now the largest pedestrian square in the city.

Many of these strategies have been adapted from those developed in smaller cities, such as Copenhagen, Amsterdam, Seville, Cambridge and pioneering Cities of Latin America, including Bogota and Medellin. Each have focussed on improving the overall mobility of the city (integrated travel, rather than mode specific improvements) and on quality of life.

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National Infrastructure Commission Call for Evidence, January 2016

London's Transport Infrastructure

Submission from Thales UK

Thales is a global technology leader for the Aerospace, Transport, Defence and Security markets. With 61,000 employees in 56 countries, Thales reported sales of €13 billion in 2014. With over 20,000 engineers and researchers, Thales has a unique capability to design and deploy equipment, systems and services to meet the most complex security requirements. Its unique international footprint allows it to work closely with its customers all over the world. Thales UK employs 6,500 staff across 11 key locations.

Thales welcomes the formation of the National Infrastructure Commission and is pleased to contribute through this call for evidence. Long term integrated planning of jobs, homes, infrastructure and transport is essential for the future competitiveness and productivity of the UK.

This paper aims to address the questions raised in the National Infrastructure Commission's Call for Evidence dated 13th November 2015 in section 3 relating to London's Transport Infrastructure and specifically focuses on questions 1, 2 and 5.

With the forecast increase in population and travel demand, Thales believes that one of the key challenges for London's Transport infrastructure will be the demand on capacity. To address this challenge, investment in innovative modernisation programmes of existing infrastructure, in addition to major new infrastructure schemes, is necessary. Creating capacity through modernisation programmes can provide a more immediate impact on the economy by enabling growth in housing and jobs, as well as generating improvements for passengers and productivity through faster and more reliable journey times.

It should also be recognised that although modernisation programmes often provide very favourable benefit to cost ratios, their impact is not always recognised in the wider political and public domain. Addressing this by providing a narrative of the importance of continual upgrade and improvement, the benefits it brings both to the economy and the passenger journey (rather than the disruption), as well as the value of the supply chain it supports would be a positive step.

Q1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

- 1.1 London's population is forecast to rise from 8.6 million to 10 million by 2030 and 11.3 Million by 2050 with demand for public transport forecast to rise by 50%, with demand for the underground expected to rise by 60% and mainline rail by 80%¹. Severe crowding on the Tube is forecast to double by 2041. It will be increasingly difficult to support passenger growth, operational reliability, efficiency and comfort expectations with the limited and ageing infrastructure capacity that we have available today.
- 1.2 Approximately 80% of daily passenger journeys in London occur on the road network, either by car, taxi, bicycle or bus. London's buses currently carry over 1 billion more passengers than the London Underground and account for nearly half of all the bus journeys made in England. TfL forecast an additional 1.25 million additional daily trips on the Capital's roads by 2018 with the forecast cost of associated delay being two and a half times its current level by 2031².
- 1.3 National Rail in the South East is also suffering from increasing capacity issues. Demand for National rail services into Waterloo is set to increase by 40% by 2043. Today, almost 30% of passengers arriving at Waterloo in the morning peak have to stand.
- 1.4 With regards to London Underground, the London Infrastructure Plan 2050 highlights that even with the current plans for modernising the London Underground Network and opening Crossrail 1, the network will be full by 2030 and further capacity will be required. The Plan indicates the potential for mainline rail to carry twice the number of passengers as at present.
- 1.5 In addition, the gap is widening between North and South London with respect to tube capacity and quality of service. London has 242 underground stations north of the river and 28 stations south of the river. Residents North of the river are more likely to enjoy the modernised tube services at intervals of 1-2 minutes whereas South of the river suburban services will be a lot less frequent and tend to be less reliable.
- 1.6 Reliability of journey time is the most important factor for passengers when choosing trains over alternative modes of travel³. In addition, the frequency of trains is a key consideration in the decision to travel by rail. If unaddressed, increasing issues with capacity may make commuting to and travelling in London less attractive to the customer, potentially having a negative economic impact and limiting London's potential for growth.
- 1.7 As such delivering additional capacity on radial routes to new centres such as Stratford, Canary Wharf and Old Oak common will be key to ensuring the success of the newer growth areas.

¹ London Infrastructure Plan 2050, Mayor of London

² Transport for London, Finance & Policy Committee, Surface Intelligent Transport System, 20 July 2015

³ Office of Rail Regulation, Rail Passenger Experience Report, April 2014

- 1.8 The relationship between housing and transportation will become increasingly important in safeguarding London's growth in the next 20 years. Integrated planning is essential in order to ensure that the value is released from land around stations to contribute to the cost of transport infrastructure. It is important that transport focuses on opening up areas for growth and that growth in the economy and housing are taken into account when deciding on transport priorities.
- 1.9 The changing nature of passenger habits and expectations is also a significant consideration. Initially this may mean customers will increasingly wish to be connected whilst travelling, expecting high capacity data services to be available on the underground as well as the Overground. Passengers increasingly use data services to plan travel journeys and rely on these services in times of disruption. Customer Information can facilitate maximising capacity on the network, both when the network is running smoothly and especially in times of disruption.
- 1.10 In the longer term the way in which transport is undertaken will be disrupted through sharing economy models, on demand and multi modal transport and autonomous vehicles. These new technologies and business models have the potential to provide many benefits to London's transport system, including reducing road traffic injuries, optimising road capacity and extending access to those with mobility difficulties. They also present challenges from a city management perspective, ranging from a free market approach to ownership and usage to a centrally controlled model.⁴
- 1.11 Along with regulatory and cultural issues, increasing interconnectivity and automation, both on road and rail, has the potential to increase the threat to the security of the transportation systems through cyber-attack. The reputational effect of a maliciously controlled transport accident could be significant. Industry and transport service providers will therefore need to prepare for this increased risk and ensure it is considered as a priority when designing and implementing transportation systems which may be susceptible to this threat.

Q2 What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

- **How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?**
- **What might their potential impact be on employment, productivity and housing supply in London and the southeast?**

2.1 London now has the Mayor's Transport Strategy and the London Infrastructure Plan 2050, which need to be funded and delivered. With the forecast increase in population and travel demand it is clear that just upgrading existing infrastructure will not be enough to meet the demand forecast beyond the next ten years.

⁴ London Infrastructure Plan 2050, Mayor of London

2.2 It is therefore essential that a balance be struck between delivering cost effective improvements to existing infrastructure now and starting to invest in the major schemes, such as Crossrail 2 which will be to meet the capacity demands beyond 2030.

2.3 London's transport system makes a key contribution, not only to the productivity of the capital, but also to jobs across the UK with 60% of Transport for London's supply chain being outside London, supporting 60,000 jobs.

2.4 As the work that Thales has done in partnership with London Underground relates to existing infrastructure we have set out below the benefits that we believe could be achieved by extending this approach to other projects.

2.5 Delivering Transport Capacity for Growth – progress to date

Capacity

2.5.1 Thales UK, in partnership with London Underground has upgraded the Jubilee and Northern lines. New signalling on the Jubilee line has allowed 30 trains per hour every hour, carrying 12,500 extra passengers an hour. The Northern line signalling system has also been modernised, delivering up to 20% more capacity or space for an additional 11,000 customers per hour. Similarly, the Victoria line has been upgraded by LUL to 33 trains per hour.

2.5.2 The Four Lines Modernisation (4LM) programme to upgrade the sub-surface network is now in progress and will increase capacity on 40% of the network by a third. TfL's business case analysis confirmed a strong case for investing £2.5Bn in 4LM with the overall programme demonstrating a Benefit-Cost Ratio of 4.7 to 1.⁵

2.5.3 Whilst the Northern and Jubilee line have been upgraded, there is still more to be achieved, to meet increasing passenger demand. The world class capacity programme aims to increase the number of trains per hour on these lines to take full advantage of the benefits that can be realised from the newly installed signalling and control systems and additional trains. This enables people to access the highly productive employment centres in central London and ensures that London Businesses can compete on an international stage to attract the best talent.

2.5.4 TfL's business case analysis for the Jubilee line world class capacity programme gives results, based on reduced average journey time of 7.7:1 for the preferred option to raise the number of trains per hour from 30tph to 36tph, with an investment of £253M⁶. For the Northern Line Upgrade, the BCR is 4.4:1.

2.5.5 The benefit generated by these programmes is summarised in table 1 below

⁵ Transport for London, Finance & Policy Committee, Modernisation of the District, Metropolitan, Circle and Hammersmith & City Lines and Automatic Train Control Contract, 17 June 2015

⁶ Transport for London, Board item 10, Jubilee Line World Class Capacity, 5 November 2014

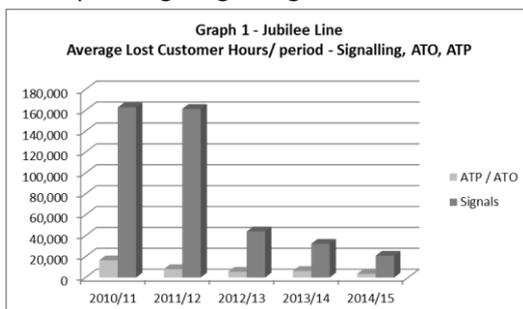
Line	% increase in line capacity	Trains per hour	Additional Customers/hour	Date
Jubilee Line	22%	30	12,500	2012
Northern Line	20%	24 on both branches during AM peak	11,000	2014
Jubilee Line World Class Capacity	20%	36		2019
Northern Line extension		28		2019
Northern Line Upgrade 2		30 on both branches		2021
District	24%			2021-23
Met	27%			2021-23
Circle	65%			2021-23
H&C	65%			2021-23
Crossrail 2	-	Up to 30	90,000	2030

2.5.6 The Jubilee line extension is a good example of how projects with a low BCR, if coupled with economic development areas and housing can completely transform an area, such as Canary Wharf. This experience indicates that projects should be assessed on their ability to pay back the original investment, including the project’s ability to create jobs, grow the economy and generate new tax receipts. This would give a more realistic view of the benefits of infrastructure investment and support investment not just in London but in other cities around the UK too.

2.6 FASTER & MORE RELIABLE JOURNEY

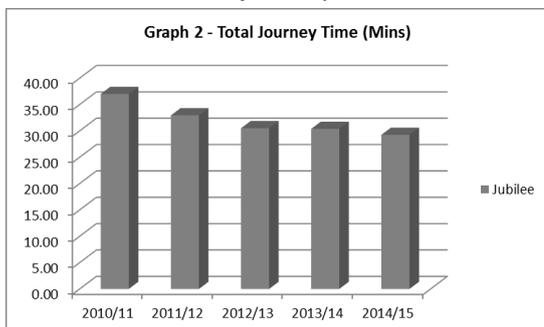
2.6.1 In addition to providing additional capacity, the upgrade programmes have also provided faster and more reliable journeys for passengers⁷. The following paragraphs use the Jubilee line as a case study to provide evidence of the performance improvements achieved by investing in modernising existing infrastructure.

2.6.2 Since the new signalling systems have been introduced on the Jubilee line the number of Lost Customer Hours attributed to Signalling, Automatic Train Operation (ATO) and Automatic Train Protection (ATP) has decreased by a factor of 7 as shown in graph 1 below, resulting in more passengers getting to their destinations on time.

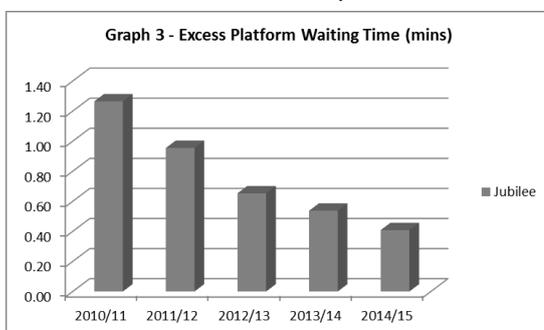


⁷ London Datastore, LU Performance Data Almanac

2.6.3 For passengers the Total Journey times have been reduced by around 13% with around 5 minutes being saved on the average journey per passenger as shown in graph 2 below. This is as a result of faster journeys as well as increased reliability of the line.



2.6.4 With an increased number of trains per hour, the next train arrives much sooner for a passenger waiting at a platform. The Platform waiting times on the Jubilee line are down from 0.81 in 2011 to 0.41 in 2014/15 2013.



2.7 Delivering Transport Capacity for Growth – Plans in progress but not yet fully funded

2.8 Rail

2.8.1 New Tube for London (NTfL) will be needed to deliver additional capacity on the Piccadilly, Central, Bakerloo and Waterloo & City Lines to support the 1.6 Million forecast growth in the London population by 2030.

2.8.2 TfL’s business case analysis confirms a strong case for investing £9.86Bn in NTfL with the overall programme demonstrating a Benefit-Cost Ratio of 4.2 to 1⁸.

2.8.3 The first stage in the programme plans to upgrade the Piccadilly line at a cost of £3.86Bn to deliver an additional 60% additional capacity. The Piccadilly line forms a vital link from central London to Heathrow and currently serves 210 million customers a year with demand expected to grow 20% by 2020⁹. In the London Chamber of Commerce 2014 business survey, 42% of

⁸ Transport for London, Finance & Policy Committee, New Tube for London Programme – Delivery Stage: Design & Specification, 23 Jan 2014

⁹ <https://tfl.gov.uk/campaign/tube-improvements/the-future-of-the-tube/new-tube-for-london>

businesses surveyed rated the Piccadilly and Bakerloo line upgrades as very important in addition to 44% considering Crossrail 2 very important for coping with population increases¹⁰.

2.8.4 The benefit that could be generated by these future programmes is summarised in table 2 below:

Line	% increase in line capacity	Tph	Additional Customers/hour	Date
Piccadilly	60%	33	19,000	2025
Central	25%	33	12,000	2030
Bakerloo line	25%	27	8,000	2033
Waterloo & City	50%	30	9,000	2032

2.8.5 Crossrail 2 will need to be approved and started by 2020, adding 10% to London's rail capacity. Crossrail 2 is expected to unlock land for up to 200,000 new homes and 200,000 jobs, adding up to £7.9 billion per annum to London's GVA and growing the national economy¹¹.

2.9 ROADS

2.9.1 A similar approach should be taken for Roads, to ensure that we maximise the capacity and performance of existing infrastructure. Road traffic can be managed in a similar way to rail traffic to maximise capacity and reduce journey times.

2.9.2 TfL is currently proposing Surface Intelligent Transport System to deliver £1Bn benefit to road users by 2036 through reduction in delays using predictive signalling at a BCR of 5:1.

2.10 Delivering Transport Capacity for Growth – Ideas for the Future

2.11 RAIL

2.11.1 By the 2020s the tube will be full, even with the planned capacity upgrades and Crossrail 1. Additional capacity must be released from the mainline rail network, by upgrading existing infrastructure, particularly in areas such as South London, in addition to progressing new infrastructure projects such as Crossrail 2.

2.11.2 Thales has been working with Centre for London in recent months to contribute to a research study called Turning South London Orange. The work aims to demonstrate how South London services could be transformed to deliver additional capacity and a reliable service to Londoners, by following a model similar to the London Overground. Many of the South London mainline stations are currently under-utilised, for example, at Brixton on the Victoria

¹⁰ London Chamber of Commerce and Industry, London Demands, The Business Agenda for General Election 2015

¹¹ Crossrail 2: Regional and National Benefits, September 2015

line there are over 29 million entrances and exits per year¹², but at Brixton Overground station just one million¹³. Many South Londoners travel miles by bus, past mainline stations, to get the tube at Brixton.

- 2.11.3 The report which is planned to be published in January 2016 could provide valuable evidence to the National Infrastructure Commission by setting out the expected impact of the additional capacity on home building and economic activity in the area.
- 2.11.4 The experience gained from improving the standard of service on the London Overground shows passenger numbers increased from 0.6 million journeys/ week in 2007 to 2 million journeys per week by late 2011, with this success being attributed a major infrastructure upgrade to deliver increased train frequency, new trains, station enhancements and service quality enhancements¹⁴.
- 2.11.5 The contribution that Thales has made to the Turning South London Orange study shows the potential to reduce delay on the suburban network by around 10-20% by deploying modern traffic management systems. Further benefits would then be gained if the area was re-signalling to modern standards including the European Train Control System and Automatic Train Operation.
- 2.11.6 Network Rail's plans for the Digital Railway adopt a similar approach by using modern state of the art signalling and control systems to increase the capacity and performance of the existing network.
- 2.11.7 Network Rail are certainly not alone in this thinking, in mid December, SBB, the infrastructure manager for Switzerland's railways published a strategy for its 20 year signalling vision, including many of the same concepts.

Q3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

Q4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

- **What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?**
- **What innovative funding mechanisms could be considered to support delivery of key schemes?**

¹² London Datastore, multiyear station entry and exit figures for 2014, Transport Planning Strategy & Service development, June 2015

¹³ Office of Rail Regulation, Train Station Usage, December 2015

¹⁴ Transport for London, Rail and Underground Panel, London Overground Impact Study, 16 November 2011

- **What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?**
- **What innovative funding mechanisms could be considered to support delivery of key schemes?**

4.1 Thales contributed to the London First February 2014 “Funding Crossrail 2” report which can be found at http://londonfirst.co.uk/wp-content/uploads/2014/02/LF_CROSSRAIL2_REPORT_2014_Single_Pages.pdf

Additional and updated material on funding is also available at the end of the ‘Crossrail 2 – regional and national benefits’ document which is available at <http://crossrail2.co.uk/why-crossrail-2/>

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

5.1 Thales has worked with other major metropolitan areas in other countries faced by similar challenges. In particular, the lessons learnt in Tokyo, Hong Kong and China could provide insight which is of interest to the National Infrastructure Commission. Please note the metro infrastructures in these cities are younger than the ones in London.

5.2 Hong Kong

5.2.1 With the high reliability and availability of the metro service and area coverage of the metro network, the percentage of Hong Kong citizens relying on Hong Kong MTR metro network for traveling has been increasing rapidly. Today a high percentage of residents and tourists are relying on MTR.

5.2.2 Understanding the keeping in good state repair and modernization of existing metro lines takes longer duration due to limited night accessible time, MTR plans re-signalling/modernization project approximately at a 20-25 years interval.

5.2.3 MTR has recently let a major resignalling project for 7 lines (134 km, 73 stations, 158 trains). They decided to deploy one train control solution for all lines in order to simplify project implementation, operation management and skilled operation and maintenance resources.

5.3 China

5.3.1 With moving block signalling, suitable physical guide way and turn backs, in China they have been able to increase the number of trains and passengers. For example: the 50 km Beijing Line 4, currently is delivering approximately 1.5 million passengers daily with headway lower

than 90 second and the 66 km Guangzhou line 3 is delivering 1.3-1.5 million passengers a day with potential to deliver more.

- 5.3.2 In general all metro lines in Shanghai are relatively new compared to lines in London. The first line to be re-signalled in Shanghai is Line 5. To achieve capacity increase, passenger growth and area coverage, mitigate migration risk and reduce the requirements for night access, Shanghai city and Shanghai metro synchronized the timing for constructing extension (17 km extension added to a 17km existing line), adding new fleet of trains (32 6-car trains in addition or to replace the existing 17 4 car trains) and constructing new equipment rooms on the existing lines. The project is to be completed in less than 4 years.

5.4 Japan

- 5.4.1 The experience in Japan has shown that by connecting high speed to commuter and high density metro, in addition to building infrastructure at the connection stations (Shinagawa for example), then massive growth and development will follow. This can be seen also along the high speed lines.
- 5.4.2 Metro services are planned to be ideally within a 5-7 min walking distance from most points in the city – drastically reducing traffic congestion within the city.
- 5.4.3 Metro is looking at minimizing all wayside / maintenance to concentrate on the passenger services with minimal labour
- 5.4.4 The long term future that JR East and other operators are driving towards are larger interconnectivity between high-speed, sub-urban and metro areas – possibly towards implementing a seamless connection from low to high density traffic on the same line/train.



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[\[contact redacted\]](#)

8 January 2016

Dear Sir

Call for Evidence: National Infrastructure Challenges

In response to the Commission's call for evidence dated 13th November 2015, please find attached a submission from the Thames Gateway Kent Partnership (TGKP). This covers two of the three topics included in the call for evidence:

- Connecting northern cities
- London's Transport Infrastructure.

Our submission draws the Commission's attention to the importance of connectivity to, as well as between, northern cities. The Channel Ports to M25 corridor, through the Thames Gateway, has a crucial role in connecting the Midlands and North of England to international markets and supply chains, and a holistic approach is needed to infrastructure investment to ensure that corridor can deliver both the capacity and resilience to sustain forecast growth.

We welcome the Commission's focus on the economic and social challenges facing London and its commuter hinterland. The Thames Gateway provides the greatest potential to support London's growth as well as regionally and nationally significant economic opportunity in its own right. There are key transport infrastructure investments required to fulfil that potential, in particular the need for enhanced rail network capacity in North Kent and South East London. Extension of Crossrail 1 from Abbey Wood to Gravesend could be part of the solution. We invite the Commission to engage with the outcomes of work being led by Transport for London and sponsored by TGKP and other partners regarding the business case for such an extension.

I trust this paper will assist the Commission and we would be happy to discuss further.

Yours faithfully

Rob Bennett, Chairman, Thames Gateway Kent Partnership

National Infrastructure Commission – Call for Evidence

Submission by the Thames Gateway Kent Partnership

1. The Thames Gateway Kent Partnership (TGKP) is a public-private partnership, established in 2001, that promotes sustainable economic growth and regeneration in North Kent.
2. TGKP has a direct interest in the second topic on which the Commission is calling for evidence, and indirect interest in the first. The purpose of this submission is both to draw the Commission's attention to issues and evidence from the Thames Gateway pertinent to the Commission's programme, and to underline the continuing importance of the Thames Gateway itself as a national priority for infrastructure investment, to inform the Commission's advice to Government.

The Thames Gateway

3. The Thames Gateway originated from the "East Thames Corridor" development capacity study carried out for the then Department of Environment in 1991-93. The Gateway's status as a priority area for growth and regeneration was formalized in Regional Planning Guidance 9a "The Thames Gateway Planning Framework", and subsequently reflected in the South East Plan and numerous Government strategy documents and delivery plans.
4. Up until 2010, successive Governments invested in substantial investment programmes in the Thames Gateway, working through local delivery vehicles including development corporations for London Thames Gateway and Thurrock and, in North Kent, the Kent Thameside Partnership, Medway Renaissance and Swale Forward. In Kent, these major investments included the creation of Ebbsfleet International Station and HS1, the A249 Sheppey Crossing, A2 widening and re-alignment between the M25/J2 and M2/J1, the Universities at Medway campus at Chatham Maritime, and major brownfield land regeneration schemes such as Rochester Riverside, St Mary's Island, Queenborough & Rushenden and Northfleet Embankment.
5. The Coalition Government abolished the Regional Development Agencies and Regional Planning frameworks in 2011 and the remaining delivery vehicles and dedicated programmes were also wound up. But the Thames Gateway continues to enjoy Government support as a strategic initiative: it is a specific responsibility of DCLG Minister Rt Hon Mark Francois MP, and is overseen by the Thames Gateway Strategic Group, chaired by Sir Edward Lister (Deputy Mayor of London) and attended by the Thames Gateway Minister and business and political leaders from across the Gateway.
6. The Thames Gateway remains the most significant opportunity for transformational growth in London and the South East. Current and emerging plans identify potential for 270,000 new homes and 360,000-390,000 new jobs in the years to 2031. The Thames Gateway reflects a long-term vision to re-focus London's economic future towards the east and support the Capital's role and status as a global city. Private and public Investment in the Thames Gateway has continued, the latter including the prioritization of Local Growth Funding by the South East Local Enterprise Partnership.
7. But the Thames Gateway is about more than jobs and homes: it is also the chief corridor that connects London, the Midlands and the North to continental Europe. The prospects for London, the 'Northern Powerhouse' and 'Midlands Engine' and their access to goods, services, supply chains and markets depend crucially upon getting the right infrastructure investment into the Thames Gateway and into Kent and Medway as a whole.

Connecting northern cities

8. In this section we focus on two of the questions posed by the Commission regarding connectivity between northern cities:

3. Which city-to-city corridor(s) should be the priority for early phases of investment?

4. What are the key international connectivity needs likely to be in the next 20-30 years in the north of England (with a focus on ports and airports)? What is the most effective way to meet these needs, and what constraints on delivery are anticipated?

9. We understand that the main thrust of the Commission's investigation is about corridors and connectivity in the north. We suggest, though, that it is important for the Commission to consider connectivity to the north, particularly the corridor that connects the UK to its main European neighbours and continental markets. Of primary concern to this Partnership, and to the Thames Gateway, is the corridor from the Channel ports via the existing Dartford-Thurrock crossing that connects the north, Midlands and East of England to continental Europe. This is critical both to the national economy and to the future growth, regeneration and prosperity of the Thames Gateway.

Pressures within the Thames Gateway

10. Population, housing and economic growth in Thames Gateway Kent will increase pressure on the strategic roads network, particularly the A2/M2 corridor serving key locations such as the new Ebbsfleet Garden City. The proposed London Paramount Entertainment Resort (see paragraph 29) will, subject to approval, also add significant visitor and workforce journeys onto both the strategic and local roads (and rail) networks.
11. Analysis of DfT statistics¹ show that motor vehicle traffic in Kent has already grown by 24% since 1994; for Medway the figure is 32%. These compare with England and South East averages of 18% and 17% respectively, and indicate the relatively greater intensification of pressure on the road network in Kent & Medway.
12. Despite the significant investments in transport connectivity in the Thames Gateway Kent area, the lesson from our experience is that the job is not done. Holistic solutions are required both to fulfil the economic potential of the Thames Gateway and to guarantee the performance of the corridors and connections on which the economies of the Midlands and the North heavily depend.

The A2/M2 and A20/M20 Corridors

13. The A2/M2 is already heavily congested with journey time reliability as low as 66% in key sections². The design and capacity issues associated with the Bean and Ebbsfleet junctions on the A2 are acknowledged by Highways England: improvements are programmed for completion by 2023. Improvement of the M2/J5 is a committed future project. The M2 is effectively a bypass for the Medway Towns, Sittingbourne and Faversham as well as a strategic road corridor. Similarly, the M20 is a major distributor road for local journeys, particularly for Ashford and Maidstone, as well as the strategic corridor linking the channel ports to the UK roads network. Consequently these routes and the links between them, such as M20/J6-A229-M2/J3 suffer heavy congestion in peak periods.
14. Across Kent's part of the Strategic Road Network, freight vehicles account for up to 41% of the traffic³. In Kent, freight traffic is concentrated on two strategic routes (M20/A20 and M2/A2) with the principal route to the Channel ports being the M20/A20 as part of the TEN-T Trans-European road network. Over the last 20 years, the number of goods vehicles travelling from Great Britain to mainland Europe has increased by 83%⁴.

¹ DfT Road Traffic Statistics, Table TRA8901

² DfT Statistics, Table CGN0106

³ Highways Agency (2014) Kent Corridors to M25 Route Strategy Evidence Report

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/364209/Kent_Corridors_to_M25_Evidence_Report.pdf

⁴ Department for Transport (2015) Statistical Release: Road goods vehicles travelling to mainland Europe: October to December 2014 (quarter 4)

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/404778/roro-2014-04.pdf

15. The Port of Dover and the Channel Tunnel are nationally important facilities. As the shortest crossing point between the UK and mainland Europe, the Dover Strait ports (Dover, Channel Tunnel and Ramsgate) account for 69% of all goods vehicles or 89% of all powered goods vehicles that travel between the UK and mainland Europe⁵. This generates substantial HGV traffic movements through Kent. Approaches around Dover on the Strategic Road Network suffer from 'moderate' and 'regular' congestion, which by 2040 is forecast to increase to 'regular' or 'severe' congestion in peak periods even with the investment from Highways England's Roads Investment Strategy (RIS)⁶.
16. In 2014, 2.4 million goods vehicles (average 6,600 per day) and 2.5 million cars and coaches passed through the Port of Dover⁷. Movements through Dover are expected to increase with plans for improvements to the Eastern Docks and the Western Docks Revival which will enhance the capacity of the Port. The Port of Dover⁸ has a planning assumption for the freight market (Dover Strait ports) based on a long-run Compound Annual Growth Rate (CAGR) of between 2% and 4% (over the period 2000 – 2014 CAGR was 2.5%), although the market is currently growing much faster and in the short term this trend is expected to continue. Therefore within the next decade there could be between 7,900 and 9,200 HGVs on average per day at the Port of Dover. At peak times there will be a significant number of days when the port handles in excess of 11,000 HGVs per day.
17. Significant growth in freight movements is also expected through the Channel Tunnel. Eurotunnel already handles significant HGV movements as over 1.4 million trucks (average 3,957 per day) used the Channel Tunnel shuttle service in 2014⁹, besides over 2.6 million cars and coaches. Future growth in freight movements of 30% is predicted for Eurotunnel for the next 5 years between 2015 and 2020 and between 20-25% growth between 2020 and 2025, equivalent to 6,400 HGVs per day by 2025.
18. Overall, cross-channel traffic using the A2/M2 and A20/M20 corridors currently amounts to more than 10.4 million vehicles per year. On the basis of the projections above, the freight element alone is forecast to grow up to 50% from around 3.8 million trucks now to perhaps 5.7 million by 2024¹⁰.
19. The Government has acknowledged the importance of keeping the M20 corridor open in the £250m investment announced for a lorry park to replace Operation Stack. This is welcome and essential, but it is still only a partial answer to a core problem of capacity and resilience on the main transport corridor connecting UK regions to Europe.

Existing and future Thames crossings

20. The most vulnerable link in the Thames Gateway roads network is the existing M25/A282 Dartford-Thurrock crossing. With use heavily exceeding capacity, and ongoing northbound congestion at peak periods despite the introduction of free-flow tolling in autumn 2014, this is "one of the least reliable links in national strategic roads network"¹¹. This much is acknowledged in the long-running process of consultation and development of options for a **Lower Thames Crossing**.
21. More resilient connections between the channel ports and the East of England, Midlands and North are vital to the success of the national economy, and particularly for logistics, businesses importing and

⁵ Department for Transport (2015) Statistical Release: Road goods vehicles travelling to mainland Europe: October to December 2014 (quarter 4)

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/404778/roro-2014-04.pdf

⁶ Department for Transport (2015) Road Traffic Forecasts 2015

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/411471/road-traffic-forecasts-2015.pdf

⁷ DfT Statistics, Table PORT0409

⁸ Godden, T. Port of Dover – email correspondence with Kent County Council 12/05/2015

⁹ Eurotunnel website accessed 29/04/2015 <http://www.eurotunnelgroup.com/uk/eurotunnel-group/operations/traffic-figures/>

¹⁰ Further detail is contained in the Report of the European Gateway Strategic Delivery Group, July 2015, Kent CC.

¹¹ Government Response to Consultation Options for a New Lower Thames Crossing, CM 8895, p.10.

exporting, and supply chains. The unreliability of the existing crossing adds cost to businesses and consumers not just in the South East but in all parts of the economy that rely in goods and services traversing routes from the Channel ports to destinations north and east of London.

Issues for the National Infrastructure Commission

22. We await with interest the Department for Transport/Highways England consultation on the preferred route for the proposed Lower Thames Crossing. However, without pre-empting the proposals to be put forward and the Partnership's consultation response, there is clear consensus amongst partners that the entire Channel ports to M25 corridor needs to be considered holistically. A network is only as strong as its weakest link. Whatever the location of the Lower Thames Crossing and its connections north and south of the crossing itself, the A2/M2 and A20/M20 corridors, and the links between them, need to be able to perform to a consistently higher standard than at present.

23. We would therefore urge the Commission to give early priority to:

- a. Examining the resilience of highways networks connecting the preferred route of the Lower Thames Crossing to the Channel Ports and the options for upgrading those connections on a timetable consistent with that proposed for the Lower Thames Crossing;**
- b. Examining the options for accelerating delivery of both the Lower Thames Crossing and associated network improvements.**

London's transport infrastructure

24. In this section we focus on two questions posed by the Commission regarding the future of London's transport infrastructure:

- 1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?**
- 2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?**

25. London aspires to be self-sufficient in meeting the housing needs of its growing population within the GLA boundary. But rising prices are pushing London's workforce ever further outwards in search of housing affordability. Its 'commuter hinterland' is thus progressively being redefined both as London-based workers travel from further away, and as selective infrastructure investments – such as HS1 – 'move' certain destinations closer to central London in terms of journey time.

26. A major emphasis of London Mayoral policy over a number of years has been to focus London's growth eastwards. This overlaps with the vision for the Thames Gateway as offering the greatest potential to support London's growth.

27. That potential brings both threats and opportunities. Delivering the Thames Gateway vision means growing local employment opportunities across the Gateway, as well as responding to the opportunities and demands of London's employment markets. The stretching of London's commuter hinterland puts further pressure on both housing markets and transport and other infrastructure in North Kent. Analysis carried out in June 2011¹² showed that an estimated 55,000 (19.4%) of the nearly 282,000 North Kent workforce were travelling to Greater London for work. For some boroughs bordering the Capital, such as Dartford, the proportion was over 36%. More than half of travel to work in Greater London from Kent and Medway was attributable to the four local authority areas in Thames Gateway Kent. These journeys would predominantly be made via the North Kent Southeastern rail lines, HS1 and along the A2/M2 corridor.

¹² http://www.kent.gov.uk/data/assets/pdf_file/0010/8200/Updating-the-2001-Journey-to-Work-Matrix.pdf

28. Commuter pressure is already evident on these transport networks. The previous section has referenced the highways congestion especially on the A2/M2. Peak rail services including HS1 already run at or exceeding capacity from many North Kent stations; and genuine high speed performance is only delivered on HS1 between Ebbsfleet and London. With projected growth of 58,600 homes, 115,400 people and 59,100 jobs in North Kent from 2011-2031¹³, pressures on capacity and performance will be magnified. Proposals are also emerging for significantly enhanced levels of growth in the adjoining London Borough of Bexley, and at the Isle of Dogs in London's Docklands. The continued commercial expansion at Docklands depends upon access to a wide labour pool, for which enhanced rail and other public transport connectivity, such as eastwards extension of Crossrail 1, will be crucial.
29. Those growth projections do not take account of the possible creation of the London Paramount Entertainment Resort (LPER) at Swanscombe Peninsula. If approved, LPER is expected to create 8,500 jobs on site (6,700 in the resort and 1,800 in hotels) plus at least 15,700 further direct and indirect jobs in the supply chain¹⁴, largely within the same travel-to-work corridor but also extending to other parts of Kent, Essex and south and east London. LPER are also modelling on the basis of an average 40,000 visitors per day from opening in 2021. During consultation on their emerging proposals, London Resort Company Holdings indicated an expected modal split of 58% of visitors arriving by private car and 24% by rail. Putting the highways impacts to one side, on the basis of these forecasts rail passengers (visitors and workforce) would add over 9 million journeys (entries and exits) onto the North Kent rail network per annum.
30. It is with these pressures in mind that TGKP has been urging Government:
- c. To facilitate a strategic and joined-up approach to the related issues affecting future rail capacity in North Kent, including the re-franchising of Southeastern rail services and Network Rail's Kent Route Study; and
 - d. Specifically to consider the the business case for extension of Crossrail from Abbey Wood to Gravesend via Ebbsfleet.
31. TGKP is a partner in a project being led by Transport for London, together with the Greater London Authority, Kent CC, Ebbsfleet Development Corporation and London Borough of Bexley, undertaking a study to understand the economic case for such an extension of Crossrail that takes account of this anticipated growth. TGKP are joint signatories with other project partners of a separate submission to the Commission giving more detail and supporting evidence on this aspect.
32. **We would welcome the opportunity to share the outcomes from this study with the Commission. We also suggest it would be helpful for the Commission to examine over the coming months the interplay between the different work programmes (Crossrail extension, re-franchising, Kent Route Study) in order to help realise optimal outcomes from, and prioritisation of, the investment associated with each.**

Thames Gateway Kent Partnership

8 January 2016

¹³ Kent & Medway Growth and Infrastructure Framework, AECOM, September 2015: Development Suitability Analysis for Dartford, Gravesham, Medway and Swale. http://www.kent.gov.uk/_data/assets/pdf_file/0012/50124/Growth-and-Infrastructure-Framework-GIF.pdf

¹⁴ See <http://www.londonparamount.info/jobs-and-skills/>. The job numbers quoted are full time: it can be expected that with job-sharing and part time working the number of people employed and therefore travelling to and from the Resort could be significantly higher.



To: londonevidence@Infrastructure-Commission.gsi.gov.uk

From: Thames Valley Berkshire LEP

8 January 2016

**National Infrastructure Commission – Call for Evidence
Response from Thames Valley Berkshire LEP**

[contact redacted]

We give consent for this response to be published, and for TVB LEP to be identified as the author.

Question	TVB LEP response
<p>1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?</p>	<p>Thames Valley Berkshire Local Enterprise Partnership published its Strategic Economic Planⁱ in 2014. We are home to a strong, productive and vibrant economy producing over £34bn GVA. We are among the strongest LEP economies in the UK. We do not find the description “commuter hinterland” helpful or useful in planning for our own economic growth. We are in discussion with neighbouring LEPs and we know that this view is shared.</p> <p>Our key locational advantage is proximity to Heathrow Airport and to central London, but our economy has its own dynamism and its own investment needs.</p> <p>Our analysis shows that labour supply issues are the single biggest threat to the continued growth of our economy. This is evidenced by high house costs both for rent and purchase, and by long commuting journeys to work. Our recent SHMAA (Strategic Housing Market Area Assessment) shows an objectively assessed need (OAN) for major housebuilding in our area (20% increase over 20 years) and that calculation does not include accommodating London’s growth needs.</p> <p>The major economic challenges we see are:</p> <ol style="list-style-type: none"> 1) Achieving certainty over expansion plans for Heathrow Airport 2) Being able to deliver a very large expansion in the supply of housing

www.thamesvalleyberkshire.co.uk

Registered address: 100 Longwater Avenue, Green Park, Reading, Berkshire RG2 6GP
A company limited by guarantee and registered at Companies House No. 07885051

	3) Being able to deliver a transport system that promotes orbital journeys around London as well as radial journeys in and out of London.
2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?	We have jointly commissioned an economic impact study that addresses exactly this question for four LEPs to the South and West of London. They are Coast to Capital, Solent, Enterprise M3 and Thames Valley Berkshire. This study is due to report early in 2016.
How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?	The above mentioned study has developed a methodology that attempts to prioritise strategic transport investments by overall economic impact.
What might their potential impact be on employment, productivity and housing supply in London and the southeast?	We will publish our study early in 2016.
3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?	We suggest that consideration be given to extending the south-western route by building new track-miles to serve Heathrow Airport. We are not convinced that a new Southern Rail Access to Heathrow scheme can be devised by utilising the existing congested tracks in South West London without having a detrimental effect on existing rail users.
4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?	-
What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?	-
What innovative funding mechanisms could be considered to support delivery of key schemes?	-
5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?	-

ⁱ http://thamesvalleyberkshire.co.uk/Strategic_Economic_Plan

TransportPlanning*Society*

Submission to the National Infrastructure Commission

Call for Evidence 2: London's Transport Infrastructure

Introduction and Wider Context

TPS supports the principle of greater consistency in the planning and funding of infrastructure at local as well as national level. It also believes that planning for infrastructure needs to have clear and specific quality of life objectives, not just a vague feeling that it must be good for the economy and then, subsequently, for people's lives.

We preface our response by raising three key issues of general application:

- the importance of allowing for the revenue consequences of capital expenditure on infrastructure and the substitution of revenue for capital (for example through demand management)
- the need to integrate transport infrastructure and land-use planning
- the need to ensure that the diverse impacts of new infrastructure for different activities are reflected in the Commission's work

Capital and Revenue

It is important to understand that capital spending in transport in particular produces revenue benefits (much of which is user time savings) rather than direct capital appreciation. This may seem obvious but has important implications for public understanding of the balance between revenue and capital expenditure which is essential if spending is to improve people's lives. Of course there are indirect capital gains from transport, the most obvious being land values.

It is also the case that the distinction between them is not clear cut – for example is the forecasting, planning and policymaking which underpins capital spending counted as revenue? If it is (as is often the case) we are quite likely to build the wrong schemes in the wrong places if the revenue budget is cut. The importance of the skills base in terms of those who commission any transport project should not be underestimated – in local authorities this has been severely weakened and any new governance arrangements must include specific proposals to create the “intelligent clients” that will be needed.

A second complication is the way that revenue schemes can obviate the need for major schemes – those which reduce demand are the obvious example.

For reasons such as these, in the TPS annual survey members place very high priority for transport spending on what are essentially revenue items such as road maintenance and smarter travel choices¹.

Thus it is rare in a developed economy that progress can be made, for example increased connectivity between places, without revenue expenditure relating to:

- The adequate maintenance of existing infrastructure, including its development and improvement
- Expenditure on services to use that infrastructure, particularly important for public transport, walking and cycling
- The provision of programmes such as travel behaviour change or road safety.

¹ The top 5 in order of priority are: Walking and cycling; Non-High Speed Passenger railway capacity improvements; Travel behaviour change (Smarter Choices); Tackling poor air quality; Road maintenance.

Both of the last two items may be supported by new infrastructure but require more direct revenue support, for example travel planning can include paying public transport fares for those returning to work (some local authorities do this but money is now unlikely to be available).

Thus a balance between revenue and capital is needed and this is why we ask the Commission to reflect this throughout its work.

Real impacts of transport spending and the interaction with Land-Use

In reality the benefit from transport investment arises from its interactions with social and economic behaviour, notably locational and modal choices. At a strategic level, these interactions include:

- ‘Compact, liveable cities’ are critical to realising the potential agglomeration benefits of urban concentration, but are undermined by the poor UK record of land-use/transport integration. A focus on large capital schemes, poorly integrated into the urban fabric and not part of an overall transport and spatial plan, has played a major part in this deficiency².
- The balance between public transport, non-motorised modes and road investment is distorted by the disconnected delivery, pricing, appraisal and planning arrangements. Roads that are free at the point of use, together with over-emphasis of road user time-savings in appraisal, rather than changes in behaviour and land values, has led to this strategic imbalance.
- More dispersed locational choices within existing housing and commercial stock are progressively ‘hardened’ by more dispersed patterns of new development. Both factors lead to increased transport demand, particularly for roads, with resultant congestion degrading transport system performance.
- It is our considered view, and has been for some time, that major new road capacity will not solve congestion unless comprehensive demand management (almost certainly by price and including freight) is in place. Indeed it is likely to be counter-productive. Smart motorway programmes, by contrast, can offer a wide range of benefits from better overall management and make better use of existing assets.

Land use and the provision of transport are closely linked and unco-ordinated planning of either, or one seen as subservient to the other, leads not to efficiency, sustainability and economic growth but to unnecessary travel and congestion and equally poor performance in terms of the economy, safety and the environment.

Multi-layered approach to connectivity

The comments above lead to the conclusion that simply connecting places, without defining what those places are and why we want to connect them, will at best lead to inefficient allocation of transport spending and at worst to causing net disbenefits, even though these may fall outside transport, for example personal health and climate change.

In order to identify where connectivity will have a positive impact it is important to understand different spatial geographies – for example journey to work areas need to

² Since the creation of the GLA and TfL this issue is being partly addressed, at least in London, see the London Infrastructure Plan at <https://www.london.gov.uk/file/22098/download?token=XZV8z8Az>

inform commuter travel plans, freight interchanges (sea, air, road and rail) and the consequent demand should help define freight networks. Local businesses need the concentration of urban form referred to earlier, thus walkability is the key. On the other hand, businesses which need bigger catchments (some stretching beyond the boundaries of individual Northern cities) need those cities to be connected with frequent, attractive, fast rail services. One of the key theoretical advantages of linking the Northern cities is that they will provide sufficient catchment for businesses to be able to locate in the North rather than serve Northern businesses from London and the South East or Northern Europe.

The idea of a layered approach with different networks has been explored in several of the TPS sponsored research bursaries, for example in the 2012 “Flexible geographies and what ‘localism’ could mean in the context of transport planning”³ which said it would be possible: *“to move from notions of ‘local communities’, ‘local transport consortia’ and LEPs based on ‘functional economic space’ to a conception of ‘flexible local geographies’ which facilitate public service delivery at the most appropriate level possible and which are responsive to a plurality of requirements.”*

In a developed country such as the UK such a sophisticated approach is essential, and is easily within our current analytical techniques⁴, indeed could be simpler than many existing major scheme road traffic models.

Thus the different networks which would meet the different connectivity requirements (city to city, suburb to city, port to distribution centre, airport to airport, airport to city etc.) should be identified individually first. Scale of use can be assessed – not necessarily a precise forecast. The impact of improved connectivity by definition has no existing pattern of use from which the future can be extrapolated.

The networks can then be aggregated so that multi-use infrastructure can be designed. This more precise targeting would have a major impact on the design of road and rail schemes. Two examples on rail would be the mixing of commuter and city to city services and ensuring the needs of freight could be better accommodated. The creation of freight train paths through a busy passenger network is already a major problem in corridors including the two which are the subject of this consultation (Connecting Northern Cities and London).

Key points for the Commission’s work

We therefore ask that the Commission’s work avoids the traditional “pay and walk away” attitude and always includes:

- consideration of future land use impacts from new infrastructure and patterns of connectivity
- an estimate of the revenue required for the most efficient use of new infrastructure and its maintenance (including smart use and intelligent mobility)
- consideration of revenue based solutions to the identified problems which change the nature or extent of the planned infrastructure projects, and of “big cap versus small cap” – particularly important for smart technologies versus large scale fixed infrastructure

³ Author James Beard, paper based on his bursary presented to the annual Transport Practitioners Meeting in 2012

⁴ For example layered network accessibility mapping

- use of a multi-layered approach to building up connectivity requirements and subsequent initiatives (revenue or capital)

In addition, improving connectivity is very uneven in its impacts, varying by:

- Mode of travel (including walking and cycling)
- Purpose of travel (not just for personal travel but including freight)
- Different physical geographies
- Different patterns and types of land use (including availability of land for housing, employment, education, culture and leisure)
- Distribution of human capital in the areas which are being connected – most obviously skills and how they match demand, but also culture, leisure and social capital
- Nature of businesses in the area affected – for example different types of businesses may need access to only one or several of the following and a single piece of infrastructure is unlikely to achieve them all:
 - wider labour markets
 - higher quality travel (especially locally)
 - more international connections
 - large scale multi-modal freight services
 - collaborative research bodies (for example universities)
 - proximity benefits through dense development and social walkability (for example London’s “Silicon Roundabout”).

Impacts of any single piece of infrastructure can be positive for some of these requirements and neutral or negative for others. Again this is not a situation where there is a blank canvas and there are high risks of unintended consequences – the M25 is a famous example. While a new piece of infrastructure may be intended to produce a primary benefit, its other impacts should not be ignored.

This argues for clarity of purpose, respect for what is already available and a deeper understanding of the way in which transport creates or facilitates change.

The TPS Response to the NIC’s questions

We welcome the opportunity to respond to the National Infrastructure Commission on the pressing issue of London’s transport requirements over the next 20 to 30 years. We have kept our response brief and focused on the key points referred to in the NIC’s call. Our members have much to offer in terms of expertise and would welcome the opportunity to further assist the Commission in its work.

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

The major challenges facing London and wider South East are undoubtedly the anticipated population growth and related job creation, the related problems of capacity constraints across infrastructure types and a long term problem of building too few homes to accommodate the growth in households.

The London Infrastructure Plan 2050 (LIP 2050) sets out a projected population growth of over 40% by 2050, bringing London’s population to over 11 million.

Much of London's infrastructure is already at or close to capacity, with London and surrounding areas facing real possibilities of experiencing water shortages and power blackouts. Commuter lines into London and the tube network frequently experience potentially dangerous levels of overcrowding. Significant parts of the Capital's main highway network are already stretched to and beyond their practical capacity with the result that whole areas can become gridlocked with the slightest of incidents.

Housing regularly tops Londoners lists of concerns, based on exceptionally high selling and rental prices, as well as over-occupation. An estimated 50,000 homes are required per year to 2050, significantly more than has been built in London in previous years.

A lack of affordable housing and the potential for infrastructure failures have obvious impacts on Londoner's quality of life. Whilst London still remains an attractive place for young professionals, high house prices could soon see young skilled and essential but still lower paid workers moving out of the city to areas where they can buy or afford to rent a property. When this happens on a large scale as is now most likely, London could experience a skills and worker shortage that would significantly effect London's economy. This would also apply further pressure on radial transport links (both road based and rail). **Transport operational staff in particular need to live close to their workplaces.**

Businesses are unlikely to choose to locate in a city that experiences power outages or one where their workforce cannot afford to live.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

There are parts of London with significant space for house building that are currently not being built on. In many cases the reason is simple; these areas do not have effective transport connections. Barking Riverside is a prime example, where brownfield land has the potential for over 10,000 new homes to be built. In the absence of the proposed extension of the London Overground to Barking Riverside, no more than 1,500 new homes are permitted. Such development will bring jobs and economic growth to the area. ***The provision of additional housing and related employment should be planned in tandem with upgraded and new transport provision and this must be placed at the top of any prioritisation assessment.***

A strategic long term approach is required that maps out London's key transport requirements. A project by project approach will not provide London with the best outcome; it is the combined impact of transport, housing and infrastructure investments that will realise the highest benefits for London.

The LIP 2050 sets out a strong plan for London's transport investment to 2050, albeit with the need for further prioritisation and an update when the Government makes its decision on airport capacity. The need for future reviews and updates, should not delay implementation of the projects identified as necessary in the nearer term. **With regard to additional airport capacity, we believe that it is essential that this review of London's infrastructure needs actually addresses the important strategic connections between the location of this additional capacity and other planned and putative rail and road schemes. The exclusion of this most important aspect from the NIC's current remit leaves a major gap in the exercise.**

Better transport links to the wider South East must also be a high priority. The proposed Crossrail 1 extension to Ebbsfleet and giving Transport for London control of more South East rail routes are crucial in ensuring the wider region is also able to unlock housing. Equally, Crossrail 2 could include a new link to Gatwick airport via Clapham Junction, Wimbledon, Epsom and possibly Dorking providing greater overall resilience to the strategic links serving this growing traffic generator. Through North London, Crossrail 2 could provide an additional link to Stansted and TfL should consider how this project can help strengthen access to the airport and how it impacts on airport capacity needs. The 4-tracking in the Lee Valley needed for Crossrail 2 would enable improved and more resilient access.

Transport for London has identified a wide range of interventions which have strongly positive business cases. We do not propose here to rank individual projects but see a pressing need for two projects in particular, namely Crossrail 2 and the Silvertown Tunnel.

Given its forecast beneficial impacts on transport relief and economic development, Crossrail 2 must be a priority and TPS is pleased to see a growing consensus from local, regional and national government on the need for the scheme. Many of the benefits of Crossrail 1 have already been seen in terms of unlocking housing growth and the TPS believes that similar gains will be accrued from Crossrail 2. Crossrail 2 should be a catalyst for directing and intensifying housing and employment along its route. It has the potential to distribute new employment growth outside the congested central London area.

Similarly, the Silvertown Tunnel is a major scheme to alleviate congestion on the Blackwall Tunnel. The overall crossing requirements of East London urgently needs to be considered in the manner set out in the introduction, bearing in mind the differences between West London and the Thames Estuary, where there will be fewer opportunities for walking and cycling to create genuine cross river communities. Silvertown Tunnel should be considered in the context of new river crossings, road, bus, tram or rail to the east of Tower Bridge. We also think there are opportunities for new technologies to be explored in the spectrum between bus and traditional heavyweight trams. Such infrastructure would open up opportunities for housing and employment growth at London Riverside and Royal Docks Opportunity Areas. Such schemes have long been regarded by existing employers and potential inward investors as being absolutely top priority.

The road component of any infrastructure plan should be accompanied by user charging, in this case tolls are already part of TfL's plans but these must be set sufficiently high to control traffic, including that diverting from Dartford.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

The Government has the ability to significantly reduce the costs of infrastructure build in London by clearly committing to a long term programme of work. This program should not be changed at political whim, but revisited periodically and adjusted to reflect changes in the way the city functions or technological advances.

A clearly set out programme of work, that sets out the timeline for major project delivery and commits to funding, will allow the construction industry to reduce costs:

- Planning for their workforce now – this will ensure there are adequate numbers of skilled workers, and avoid the need to pay excessive wages to those with skills in short supply. It will also reduce delays.
- Planning their supply chain now – this will reduce delays and the cost of sourcing materials and component parts. This will have the added benefit of allowing firms around the UK to gear up to supplying projects such as Crossrail 2, avoiding the need to source materials from abroad.
- Certainty will enable greater investment, which will require a lower rate of return due to the lower risks of the project being stalled or abandoned.
- A long term plan will enable effective sequencing of projects, to either remove clashes for particular skilled workers or allow synergies to evolve e.g. where joint training academies are established. Maybe this should be first?

The London Infrastructure Plan 2050 and the Mayor’s Transport Strategy need to be articulated into a programme of work that sets out and sequences the key infrastructure projects and development sites over the next 20 years.

The TPS believes this is the single most effective way to reduce costs. On Crossrail 2, there are likely to further efficiency savings that are possible for use of different building materials and/or custom building of stations. Further innovations may come forward that reduce costs. This is tax payers and London fare payers’ money being spent, so every effort needs to be made resources available to make sure it is being spent wisely.

The TPS recommends that infrastructure providers, innovators and academics are brought together and set the challenge to reduce the build cost of Crossrail 2. Many of the innovations that come forward would likely be applicable to wider infrastructure build.

The benefits of Crossrail 2 will be maximised when it is planned alongside London’s wider infrastructure needs. This will ensure the possibilities for integration are taken full advantage of.

For example, green infrastructure should form a central part of station build, with green roofs and sustainable urban drainage around stations. This will reduce the need for traditional ‘grey’ drainage solution that are typically much more costly, as well as contributing to overall place making around stations. Including green infrastructure in the construction brief is far more cost effective than retro fitting later and will be particularly important in areas like the Upper Lee Valley where the growth areas are located in [flood risk zone 3a](#) and have a high probability of flooding

Providing green infrastructure has clear social and economic benefits. Examples are improving public health through cleaner air quality and reducing risks to lives from flooding and heat waves.

With coordinated planning Crossrail 2 tunnels can carry fibre optics for digital connectivity, an opportunity that was missed with Crossrail 1.

One of the main benefits of Crossrail 2 is the potential to unlock significant housing growth along its route. ***The potential for the creation of new vibrant communities will be maximised if there is a clear and early commitment to fund and deliver Crossrail 2 to stated timescales.*** Experience from London’s Docklands demonstrated that an early physical and hence visible start at least to preparatory works generates early simultaneous inward investment. This will give developers the confidence to start building homes and

invest in the public realm aspects of the development that will ensure high quality places to live are created.

Jobs are the other main benefit for London overall and areas along the route, again a clear commitment to Crossrail 2, will allow training programmes to be put in place to ensure local people benefit from the job opportunities created.

The benefits of Crossrail 2 will spread far wider than London, and this must be factored into any consideration of the benefits.

The rail line will serve the wider South East and will connect to National Rail networks in Hertfordshire and Surrey, better linking those to the London Underground and national and international services. Crossrail 2, like Crossrail 1, is forecast to generate jobs around the UK – 60,000 while it is being built and 200,000 once the project is operational.

Crossrail 2 will maximise the effect of other transport investments, particularly those such as High Speed 2, that better connect other parts of the country to the capital; by relieving congestion at key points where National Rail lines meet the London Underground. It would be less than optimal to improve journey times into London, only for passengers to be held up accessing an overcrowded tube network. HS2 arriving into Euston station is the obvious example.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

Crossrail 2, along with many of London's other transport requirements have a positive business case and will generate significant additional value for London and the UK as a whole. In the long run, investment will pay for itself through higher productivity, greater revenues to business, increased land and property values, and increased tax receipts for government. ***The issue is how these gains are captured and used to fund infrastructure investment.***

The TPS support's the GLA's pursuit of additional fiscal devolution. Devolution of the form set out by the [London Finance Commission](#), whereby London retains income from property tax to make self-determined investments in its infrastructure, would provide a source of revenue in itself and provide greater scope to borrow to fund infrastructure. A funding gap will still remain, and alternative funding mechanisms will be required.

Transport investment in particular can have a significant impact on property prices. Crossrail is demonstrating this well, even before it has opened – Whitechapel residents are expected to see a 54% increase in property values, with the average increase along the line expected to be 9%. As a minimum, the increase this brings in stamp duty and business rates revenue should be available to London, which the city can then borrow against to fund transport projects.

Learning from the Northern Line Extension and similar schemes, there are opportunities to take advantage of local uplifts in land values. ***The TPS would like to see mechanisms put in place to allow the capture of increased property and land values for example through the opportunity and compulsory purchase of land parcels along key new transport routes and through additional property taxes in areas that have seen significant increases in property values due to transport investment.***

Crossrail was funded by equal contributions from Central Government, London Government and London business. London businesses were in support of this arrangement and are signalling similar levels of support for a comparable arrangement for Crossrail 2.

It is reasonable to argue that those who benefit should pay, its seem logical that the cost should be shared between National Government (who will gain from increased tax revenues), property developers (who will gain from higher returns), residents (who will see a rise in the value of their property), passengers (who will gain from improved connectivity, reduced journey times and so greater access to jobs and leisure opportunities) and London businesses (who will gain from improved connectivity for customers and employees).

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

On financing, the Mayor of Chicago Rahm Emmanuel set up a Chicago Infrastructure Trust as a new method of generating private investment for infrastructure projects.

The Trust has funded an energy retrofit programme for 60 public buildings, costing \$12.234million and recently negotiated a \$32million 4G upgrade of the Chicago transit system. It has also been suggested that the Trust could fund a high speed rail link to O'Hare Airport.

The Trust does not work as a Private Finance Initiative (PFI). Instead, the Mayor would release bonds for the private sector to invest in, whilst ownership and management of the infrastructure would remain with the public sector.

In London, an Infrastructure Trust could be set up in the same way as the London Enterprise Panel, under sections 30 and 34 of the Greater London Authority Act 1999. Should a Trust be set up, it could provide a significant level of funding for projects like Crossrail 2.

The TPS would support further applications of the Mayoral Development Corporation model but with the ability to link groups of development/regeneration sites along the "string of pearls" routes defined by the new rail links and extending beyond the GLA boundary.



RESPONSE TO THE NATIONAL INFRASTRUCTURE CALL FOR EVIDENCE

RESPONSE TO THE NATIONAL INFRASTRUCTURE CALL FOR EVIDENCE

Paragraph 3. London's Infrastructure

RESPONSE. 3.1.2

THE ECONOMY

The effect of the development of our rail and road network in the UK was to bring economic development to areas which would have otherwise remained in a backwater.

Goods could flow freely between centres of manufacturing and businesses could interact with their counterparts in centres across the UK.

The government Command Paper, **Action for Roads A network for the 21st century**, sets out the government's vision for our roads:

Our road network is also the life-blood of the economy, performing a crucial function in supporting jobs and growth.

Roads provide critical connections. They link major economic centres, and connect our major ports and airports. Many people use them to get to railway stations and to connect to other modes of transport. Four of the new stations planned under High Speed 2 will link to the motorway network.

Roads support job creation and unlock new development. They provide access to labour markets and unlock new opportunities for factories and businesses. More than 1 million jobs are associated with road transport. Factories and other businesses regularly consider access to good roads and other transport connections in making decisions about where to locate

INFRASTRUCTURE AND THE ECONOMY

It has become increasingly evident that new infrastructure brings in its wake new development. This illustrated in the requirement for every local authority to develop planning documents which must include how the local infrastructure of the area will be developed in order to promote growth and prosperity within the area. Wherever one goes, isolated land suddenly becomes desirable to developers as soon as a new road makes development economically feasible – housing, employment and community use. It is happening all the time.

However, the amount of traffic congestion has become unacceptable within the London conurbation. Do we build more roads, provide more buses? What can we do? Land is scarce and valuable and not an infinite commodity; there comes a time, that even with the best of intentions, it becomes impossible to plan ourselves out of the congestion dilemma facing the London conurbation.

How can we provide more capacity given the scarcity of land? We need to look outside the box. How can we provide more capacity without compromising vital resources?

Double-Decking - Road over Rail

ECONOMIC GROWTH FOLLOWS INFRASTRUCTURE DEVELOPMENT

HOW CAN WE INCREASE ROAD CAPACITY?

Our suggestion is to build elevated roads above the existing railway tracks as they approach London.

Typically, these elevated roads would be:

- dual purpose roads carrying all traffic or,
- limited to vehicles up to 3.5 tonne GVW which would only need short, sharp interchange ramps and narrow lanes, limited access and exit at appropriate locations

Their use could be for:

- express traffic.
- service and delivery vehicles

They would have a futuristic road design which would maintain and increase the global perception of London as a centre of excellence.

The infrastructure building would create jobs and would enhance the desirability of the city of London for inward investment and would contribute to the international status of the city.

Across the world there are many examples of double-decking, but mainly in the use of roads. However, there are many examples of dual purposes bridges carry both road and rail.

LONDON RAILWAY CORRIDORS

We consider that there is potential in studying the routes set out below, to determine the feasibility of building roads on top of the railway infrastructure.

- Charing Cross to Sevenoaks
- Euston West Coast Line to Watford
- Fenchurch Street to Barking
- King's Cross - East Coast Line to Hatfield
- Liverpool Street to Romford
- Marylebone to Amersham
- Paddington to Slough
- St. Pancras to Luton airport
- Victoria to Gatwick Airport
- Waterloo to Guildford

All of these lines approach London from many different directions. Many of these lines have adequate land at the track side which would facilitate the building of elevated roads. We recognise some lines would have greater potential than others and the method of construction may need to vary between different routes.

Construction activity would not impact on other road users as it would if major roadworks were introduced on the road network

Time has not permitted us to make an in depth study of these corridors but we submit this concept for serious consideration.

STUDIES

HOW TO “BUILD OUR WAY OUT OF CONGESTION” INNOVATIVE APPROACHES TO EXPANDING URBAN HIGHWAY CAPACITY (USA)

Study on double decking

“Alstot, in a paper for the American Society of Civil Engineers, argued that on wide west coast urban expressways, with over 80 percent of the traffic in light vehicles, it is wasteful to build the whole cross-section to heavy truck standards”

Advantages

- Minimal extra land space required.
- Very little need for compulsory land purchase or re-development.
- Construction of infrastructure will boost economy & create jobs.
- Reduction in CO2 emissions from queuing traffic.
- Improves direct access into the centre of city.
- Reduction in traffic on over-populated routes & resulting increase in pedestrian safety.
- Lanes could have short, sharp interchange ramps and narrower lanes
- Continuity of service on the railways due to protection from inclement weather.
- No further demand on green space – minimal impact on the environment
- More opportunity for business expansion (attraction to investors)

CURRENT OPTIONS TO SOLVE LONDONS CONGESTION

“The Mayor of London wants economic output to grow at the same rate as New-York between now and 2030”

His Roads Task Force - Transforming key corridors - Report

The Report includes “TfL is working to investigate opportunities to transform key corridors outside central London, including the North and South Circulars.

The study is looking at options for major schemes on radial and orbital corridors across London, including the feasibility of fly-under, new tunnels and ‘decking-over’ sections of road.

We salute the Mayor for the work he has done and the London Road Modernisation Plan.

This submission is intended to build on the objectives of the Plan.

ROAD OVER RAIL Examples

Bangladesh

Bangabandhu Bridge

The bridge established a strategic link between the eastern and western parts of Bangladesh. It generates multifarious benefits for the people and, especially, promotes inter-regional trade in the country. Apart from quick movement of goods and passenger traffic by road and rail, it facilitated transmission of electricity and natural gas, and integration of telecommunication links. The bridge is on the Asian Highway and the Trans-Asian Railway which, when fully developed, will provide uninterrupted international road and railway links from southeast Asia through Central Asia to northwest Europe.

Basic features of the bridge are length (main part) 5.63 km; width 18.5 metre; spans 49; deck segments 1263; piles 121; piers 50; road lanes 4; dual-gauge railway (broad gauge and metre gauge). Cost - 2.97 billion USA dollars

<https://www.youtube.com/watch?v=S6pXWw6fHk0>

Denmark-Sweden

The Öresund Bridge runs between Denmark and Sweden as a double decker, double-track railway running underneath a motorway bridge. The bridge runs nearly 8 kilometres (5 miles) from the Swedish coast to the artificial island of Peberholm which lies in the middle of the strait. The crossing is completed by a 4 km (2.5-mile) a tunnel, from Peberholm to the Danish island of Amager.

The cost for the Öresund Connection, including motorway and railway connections on land, was €4.0 billion

JRA 5th January 2016



8th January 2016

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Unite note to National Infrastructure Commission Calls for Evidence

This note is submitted by Unite the Union. Unite is the UK's largest trade union with over 1.4 million members across all sectors of the economy including manufacturing, transport, energy and utilities, construction, metals and foundries, information technology, food and agriculture, financial services, health, local government and the not for profit sectors.

Unite is unable to respond to the three separate calls for evidence, not least on account of the tight timescale given - effectively eight weeks including the Christmas period. This is not a suitable consultation period.

However, we do want to make an important general point to the Commission.

The current crisis in the steel industry has highlighted the need for British steel to be at the heart of major infrastructure projects.

European rules give EU governments the capacity to award procurement contracts based on 'buying social', a principle which Unite supports. This allows governments to consider the social impact of contracts through the 'most advantageous economic tenure' in the award procedure which will enable governments to put more emphasis on quality, environmental considerations, social aspects and innovation, whilst taking into account the price and life cycle costs of goods being procured.

Government has amended procure guidelines, but the impact of these changes will not be apparent for a considerable time.

We note that this is a point picked up by the House of Commons Business, Innovation and Skills Committee in its report into the UK steel industry published just before Christmas 2015.¹ The Committee calls on the Government to “actively champion the use of domestic steel in large public infrastructure projects.” More specifically, it recommends that:

“the National Infrastructure Commission looks closely at how the interests of UK steel industry and its supply chain can be considered in relation to large scale procurement decisions.”

We believe that major infrastructure projects should use British steel to support steelmaking and manufacturing in the UK, a key component of the UK economy.

[contact redacted]

8th January 2016

¹ <http://www.publications.parliament.uk/pa/cm201516/cmselect/cmbis/546/546.pdf> (page 16, paragraph 20)



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Unite note to National Infrastructure Commission Calls for Evidence: transport

This note is submitted by Unite the Union. Unite is the UK's largest trade union with over 1.4 million members across all sectors of the economy including transport, manufacturing, energy and utilities, construction, metals and foundries, information technology, food and agriculture, financial services, health, local government and the not for profit sectors.

Unite is unable to respond to the three separate calls for evidence, not least on account of the tight timescale given - effectively eight weeks including the Christmas period. This is not a suitable consultation period.

We are happy to engage further with the Commission on further points of detail in future. But we would like to draw the Commission's attention to the following:

- In our submission to the Department for Transport's Maritime Growth Study we argued that in the short term, the west coast of the UK will have a greater growth potential than the east coast and that the opening of Port Salford and Liverpool 2 will provide Manchester and its surrounding area with the manufacturing opportunities.¹
- In our submission to the Airports Commission discussion paper on utilisation of the UK's existing airport capacity we pointed out that since Manchester has opened its second runway, it has obtained more interest from airlines in developing routes. As a result a greater number of passengers are flying into Manchester as opposed to London, in

¹<https://api.groupdocs.com/v2.0/shared/files/fe52acd00773ad9a77b0204d364315c77bdeb8c7678e13a07825a5924bf65a91?render=true>

order to connect to longer haul routes. This shows that the airport has the potential to become a regional hub.²

- Bus lanes are a vital part of public transport in London. They allow for the travelling public to choose a speedy and reliable form of surface transport that helps the environment supports business and encourages tourists to use a convenient and popular alternative to the private car. Without bus lanes congestion and pollution would increase. TfL & local councils should continue to expand bus lane availability where appropriate between 7am to 7pm. Access should be available to buses, taxis and coaches on all existing and new bus lanes. New road schemes should allow for access for all three transport modes mentioned above.

As the UK's largest transport union we want to draw the Commission's attention to the importance of investment in transport infrastructure.

We have recently published an updated version of Unite's 'Strategy for Transport'³ which goes into more detail, but key points include the importance of the Government:

- investing immediately in modernising our transport infrastructure system to boost productivity and build a sustainable economy;
- delivering in a sustainable and accessible way on commitments made for the high speed rail network;
- delivering on the Crossrail project, which will be essential to the development of London's prosperity and competitiveness;
- ensuring an effective hub airport in an environmentally sustainable manner and addressing the lack of airport capacity in London and the South East by acting swiftly on the Airports Commission recommendation for a new runway at Heathrow.

The Prime Minister has acknowledged the importance of transport infrastructure for growth saying: "without world-class transport we will not get growth; people won't invest in here; and regions in decline will be left further behind."⁴

We believe that investing in infrastructure projects now, such as modernising the UK's transport system, would boost growth in the short term and increase potential economic output over the longer term. Research shows that this would have a small impact on long-term debt and with even a modest impact on productivity, would effectively pay for itself.⁵

²<https://api.groupdocs.com/v2.0/shared/files/f5c930bb69c2f8d2ed6d1f905e4f7a1df4505bd141d83baf79a20809cab2b5?render=true>

³ Available at [http://www.unitetheunion.org/uploaded/documents/Transport%20Matters%20-%20a%20Unite%20strategy%20for%20transport%20\(updated%20December%202015\)11-24947.pdf](http://www.unitetheunion.org/uploaded/documents/Transport%20Matters%20-%20a%20Unite%20strategy%20for%20transport%20(updated%20December%202015)11-24947.pdf) and pdf copy e-mailed to Commission with this note.

⁴ <https://www.gov.uk/government/speeches/pm-speech-on-infrastructure>

⁵ https://www.tuc.org.uk/sites/default/files/tucfiles/infrastructure_spending.pdf

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8th January 2016

UPDATED

Unite represents more than a quarter of a million men and women transport workers

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Transport Matters



A Unite Strategy for Transport



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Updated November 2015



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UPDATED
NOVEMBER
2015

Foreword:



Len McCluskey

By Unite General Secretary, Len McCluskey

Unite is the UK's largest transport union. We represent workers in all areas of transport including buses, road haulage, logistics, civil aviation, coach, taxi, tram, rail, docks, ferries and waterways. We also represent the majority of union members in the vehicle building and automotive sectors and the aerospace sector.

Unite, and its predecessor unions, has a long and proud record of campaigning for a strong and sustainable transport strategy, and for transport workers. A central part of our economy and every community, transport and transport workers play a critical role - for people, for businesses, for services and for society as a whole.

This Transport Strategy makes the case for a clear and bold strategic role for transport to drive economic recovery, deliver a sustainable future and make for a better and fairer society.

Len McCluskey
General Secretary

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This updated Unite Strategy for Transport was launched at Unite's National Transport Sector Conferences in November 2015.

Transport and devolution

The principles of this Transport Strategy underpin Unite's commitment to transport at all levels across England, Scotland, Wales, Northern Ireland and the Irish Republic. Please see contact page at the end of this publication for further information on Unite's strategy in the respective nations.

International and European transport priorities

There is a clear international dimension to transport and Unite is working with the International and European Transport Workers' Trade Union Federations (ITF and ETF) in addressing many of the challenges faced by the sector as a whole. This includes contributing to the ITF Global Strategy 2014-2018 and the ETF's work programme for 2013-17 which feature activities relevant across transport modes, such as sustainable transport, labour and trade union rights, and cross-border representation, as well as activities that are related to specific sectors (including urban public transport, road, docks, maritime, waterways, civil aviation and railways).¹



¹ <http://www.itfcongress2014.org/>



INTRODUCTION:

TRANSPORT NEEDS A CLEAR STRATEGY

Transport is vital to our lives. It is a public service and an economic driver. It is essential to work, family life, personal independence and opportunity. It helps communities to thrive - locally, regionally, nationally and internationally. Transport also has a critical role to play in meeting the challenges of climate change and reducing pollution.

Transport policy is currently dominated by the impact of global economic pressure and public sector cuts. It is also subject to the legacy of privatisation and deregulation, and by a 'race to the bottom' in the use of contracting, sub-contracting and outsourcing, as well as agency working, zero hours contracts and bogus self-employment.

Transport workers are subject to profit-led cost cutting, undercutting and insecurity which are eroding safety, training and standards, and putting downward pressure on pay, pensions and decent working practices.

Transport users are experiencing overcrowding² and reporting poor satisfaction levels³. Traffic congestion has direct and indirect costs to the economy with one study finding that between 2013 and 2030, the total cumulative cost of congestion to the UK economy is estimated to be over £300 billion, with the annual cost of congestion set to rise by 63 percent to £21.4 billion over the same period.⁴

UK transport needs government to have a clear long-term strategy. This was recognised in separate reports by parliamentary select committees in early 2015. The House of Commons Transport Committee called for an "integrated transport strategy, which takes a route-based approach to road and rail investment, and prioritises connectivity to ports and airports."⁵ The Public Accounts Committee called for Department for Transport to "set out a long term strategy covering the next 30 years for transport infrastructure in the UK, and use this strategy to inform decisions about investment priorities".⁶

A transport policy based on market forces cannot meet the national interest.

What is needed is a clear, integrated and sustainable transport strategy that recognises the importance of transport to society, the economy and the environment, as well as the key role played by transport workers.

Unite is calling for a transport strategy that includes:

- a commitment to investment;
- accessible, affordable, integrated and accountable public transport;
- a fundamental shift away from further privatisation and deregulation;
- safe transport with decent employment standards, equality and protection for transport workers;
- a sustainable transport system that is better for the environment.

² <http://www.theguardian.com/uk-news/2014/sep/21/tube-overcrowding-london-train-lines> and <http://www.bettertransport.org.uk/campaigners-respond-government-figures-rail-overcrowding>

³ <http://www.bbc.co.uk/news/uk-33273393>

⁴ <http://inrix.com/press/traffic-congestion-to-cost-the-uk-economy-more-than-300-billion-over-the-next-16-years/>

⁵ *Investing in the Railway* (2015): <http://www.publications.parliament.uk/pa/cm201415/cmselect/cmtran/257/257.pdf>

⁶ *Lessons from Major Rail Infrastructure programmes* (2015): <http://www.publications.parliament.uk/pa/cm201415/cmselect/cmpublic/709/709.pdf>

TRANSPORT NEEDS INVESTMENT

Transport is critical to the economy. The transportation and storage sector contributes £134bn towards the UK's turnover (4% of the UK total). Gross value added (GVA) for the sector is £91bn (7% of the UK total) and the sector employs 1.45 million people, accounting for 5% of total UK employment.⁷

However, the transport sector should not just be valued on its considerable direct contribution to output and employment. It supports national and local economies in many other ways. Effective transport systems provide access to goods, services and jobs.

Transport is essential to helping city regions to thrive, securing private sector growth across the country and improving exports to international markets.⁸ Transport is also essential to the development of rural economies.

The influential Eddington Transport Study was clear about the long-term links between transport and the UK's economic productivity, growth and stability.⁹ It found that transport schemes can deliver overall benefits averaging £4 per £1 of government expenditure and cited a potential cost of £22 billion a year in increased congestion by 2025 if the transport network does not keep up with demand.

Transport is in desperate need of investment. UK public spending on transport as a percentage of GDP was 1.1% in 2014-15, down from 1.5% in 2009-10¹⁰, and is low by historic and international standards.

Figures from the OECD's International Transport Forum find that UK investment in inland transport infrastructure as a percentage of GDP was 0.6% in 2013. This compares to 1.1% in France and Japan, 0.9% in Denmark, 0.7% in Spain and 1.6% and 1.6% in Australia.¹¹

There is a lack of investment in the UK's infrastructure, including transport, and government has a key role to play. Some have argued that government should set a higher minimum ratio - perhaps 2 per cent of GDP by 2020/21 - for infrastructure investment in key areas like transport and energy.¹²

Public investment in transport must at least match the best international levels.

Investment in infrastructure

The LSE Growth Commission found that the provision of roads, railways and airports in the UK is characterised by underinvestment and inadequate maintenance.¹³ The Commission highlighted that UK road congestion is amongst the worst in Europe, the aviation sector suffers from constrained airport capacity, particularly in the South East, and our railways have a poor reliability record by international standards.

The Prime Minister has acknowledged the importance of transport infrastructure for growth saying: *"without world-class transport we will not get growth; people won't invest in here; and regions in decline will be left further behind."*¹⁴

The Government's 'productivity plan' published in July 2015 acknowledges that *"the UK has not invested well enough in the transport infrastructure"* and states that the Government is set to publish a new long-term National Infrastructure Plan for the key economic infrastructure sectors including transport.¹⁵ However, this is hard to square with the Government's freezing of rail upgrades¹⁶ and stalling a decision on a third runway at Heathrow despite the Airports Commission recommending this option.¹⁷

Transport provides a 'multiplier-effect' to other sectors of the UK economy. The British Chambers of Commerce (BCC) has estimated a transport infrastructure 'multiplier-effect' worth around three times the cost of a powerful package of road, rail and airport improvements, which will deliver economic benefits worth a projected £86.3bn for an outlay of £30.1bn.¹⁸

Unite is also concerned about further cuts to departmental spending. In advance of the 2015 Spending Review the Department for Transport, along with other non-protected departments, is facing cuts of 25%-40%. Notwithstanding infrastructure investment, there are real concerns that "everyday transport" - such as local roads, bus services, cycling and walking - will be particularly at risk.¹⁹

Investing in infrastructure projects now, such as modernising the UK's transport system, would boost growth in the short term and increase potential economic output over the longer term. Research shows that this would have a small impact on long-term debt and with even a modest impact on productivity, would effectively pay for itself.²⁰

The Government should invest immediately in modernising our transport infrastructure system to boost productivity and build a sustainable economy.



⁷ *Transportation and Storage: Sector Skills Assessment 2012 Briefing Paper*, UKCES (2012): www.ukces.org.uk/assets/ukces/docs/publications/briefing-paper-ssa12-transportation-storage.pdf
⁸ See *The UK's Growth Landscape*, CBI (2012) http://www.cbi.org.uk/media/1805639/cbi_the_uk_s_growth_landscape_oct_2012.pdf and *Poor transport connections hold exporters back, says BCC* <http://www.britishchambers.org.uk/press-office/press-releases/poor-transport-connections-hold-exporters-back,-says-bcc.html>
⁹ *The Eddington Transport Study* (2006)
¹⁰ Table 4.4, *Public Expenditure Statistical Analysis 2015* (HMT 2015) - https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/446716/50600_PESA_2015_PRINT.pdf
¹¹ http://stats.oecd.org/Index.aspx?themetreeid=24&datasetcode=ITF_INV-MTN_DATA#
¹² *Setting the Fiscal Rules*, IPPR (IPPR, 2015): http://www.ippr.org/files/publications/pdf/setting-fiscal-rules_Dec2014.pdf?noredirect=1

¹³ *Investing for Prosperity*, LSE Growth Commission (2013) <http://www2.lse.ac.uk/researchAndExpertise/units/growthCommission/documents/pdf/LSEGC-Report.pdf>
¹⁴ Prime Minister's speech on national infrastructure, Institute of Civil Engineering, 19th March 2012 - <http://www.number10.gov.uk/news/pm-speech-on-infrastructure/>
¹⁵ *Fixing the Foundations: creating a more prosperous nation* (HM Treasury, 2015): https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/443898/Productivity_Plan_web.pdf
¹⁶ <http://www.theguardian.com/uk-news/2015/jun/25/network-rail-chief-to-step-down-as-385bn-upgrades-are-delayed>
¹⁷ <http://www.bbc.co.uk/news/uk-politics-33341548>
¹⁸ http://www.britishchambers.org.uk/assets/downloads/policy_reports_2010/business_transport_priorities.pdf
¹⁹ <http://www.bettertransport.org.uk/everyday-transport-risk-government-spending-review-say-transport-groups>
²⁰ *Macroeconomic impacts of infrastructure spending*, National Institute of Economic and Social Research (2013) - http://www.tuc.org.uk/tucfiles/592/Infrastructure_spending.pdf

The Government must deliver in a sustainable and accessible way on commitments made for the high speed rail network. Despite concerns about some of the detail of the proposals, Unite supports the principle of HS2 and its extension which should be used to boost jobs and skills. **The Government must also deliver on the Crossrail project, which will be essential to the development of London's prosperity and competitiveness.**

Government must also ensure an effective hub airport in an environmentally sustainable manner and address the lack of airport capacity in London and the South East by acting swiftly on the Airports Commission recommendation for a new runway at Heathrow. This is not just an issue for London and the South East but for the whole UK economy. There is also a need to improve connectivity and regional airport capacity to meet projected passenger growth.



Fair and effective procurement

Proper investment in transport must also include fair and effective procurement. Scandals such as that which saw job losses at train manufacturer Bombardier resulting from the Government's decision to award the £3bn Thameslink carriages contract to Siemens must never happen again.

The handling of the Thameslink contract including the calculations of costs and benefits and bundling of train leasing with building and maintenance effectively put Bombardier at an unfair and unjustifiable disadvantage.²¹

Government procurement strategy must be transparent and supportive of UK industry. Contracts, such as that for Crossrail, must include social impact clauses and ensure fairness for British based manufacturing and the supply chain.



²¹ *Knowing What to Do? How not to build trains*, CRESC Research Report (2011) <http://www.cresc.ac.uk/news/news-from-cresc/how-not-to-build-trains>

TRANSPORT FOR ALL – Accessible, affordable, integrated and accountable

Investment in transport isn't just about infrastructure. Public transport plays a vital role in reducing inequality and providing mobility for many people, particularly those on low incomes, enabling them to better participate in society. A House of Commons Select Committee report has found that problems with transport provision and the location of services can reinforce social exclusion and that accessibility is worsening, driven by tight budgets in central and local government.²² It recommends that **the social value of transport needs to be explicitly considered in policy-making and in the planning system.**

The Equality Trust has also highlighted how our transport system can be a driver of inequality and finds that the richest 10% of households receive almost double the transport subsidy of the poorest 10%.²³ It recommends that the Department for Transport, and all other government departments, should review the net effect of their existing policies as a whole on inequality.

Unite also recognises the importance of Community Transport Services and the role they play in delivering a more accessible and inclusive transport system. Concessionary travel is an important part of ensuring equality of access to transport and **concessionary travel policy should ensure that anybody unable to make use of their concession on existing eligible transport services should be permitted to use it on other transport services.** This fair level of service for excluded individuals must not adversely affect the level and quality of service enjoyed by existing passengers.²⁴

Government needs to ensure that public transport fulfils its important social function by being accessible, affordable, integrated and accountable.

Accessible

Public transport has an important part to play across a range of key areas, such as health, social care and employment; for example, connecting people to sport and leisure facilities, ensuring people without access to a car are able to reach health facilities, enabling older and disabled people to retain their independence, and widening employment opportunities for unemployed people.²⁵ It also matters to young people where changes in government funding of transport can have a dramatic impact.²⁶ Rural transport and subsidised travel to remote areas and islands also need to be protected.

Women are more dependent than men on public transport. Only 30% of women have access to a car in the day time.²⁷ Passengers carrying children in pushchairs or shopping (most usually women) need adequate storage space.



²² *Transport and accessibility to public services*, House of Commons Environmental Audit Committee (2013) - <http://www.publications.parliament.uk/pa/cm201314/cmselect/cmenvaud/201/201.pdf>

²³ *Taken for a Ride*, Equality Trust (2015) - <https://www.equalitytrust.org.uk/taken-ride-how-uk-public-transport-subsidies-entrench-inequality>

²⁴ <http://www.ctauk.org/policies-legislation/concessionary-travel.aspx>

²⁵ See, for example, *Total Transport: working across sectors to achieve better outcomes* (pteg, 2011) - <http://www.pteg.net/NR/rdonlyres/E963D5DA-346A-4CBA-B7DB-569488F07AF7/0/20110627ptegTotalTransportforWebFINAL.pdf>

²⁶ *No Entry! Transport Barriers facing Young People* (Intergenerational Foundation (2013) - http://www.bettertransport.org.uk/sites/default/files/research-files/No_Entry_final_report_definitive_0.pdf

²⁷ *Valuing the Social Impacts of Public Transport*, DfT (2013) - https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/226802/final-report.pdf

Vehicles must be designed to prioritise safety, accessibility and protection of the environment. But accessibility is not only about vehicle design. It is about bus drivers having the time to pull up close to the kerb at bus stops, and to wait until passengers sit down before they move off. But when buses are scheduled for maximum profits these needs are ignored.

People not only want to feel safe, they want to feel secure. The removal of guards from rail and underground services and stations has left passengers feeling more anxious about personal security. Fears over staffing cuts suggested in the McNulty Review into Rail²⁸ and through 'savings' the Government wants rail companies to make only serve to increase that anxiety.²⁹

We need to plan and run public transport in a way which makes it positively accessible to everyone. **This can only happen if transport policy makers properly consult with passenger groups and user organisations as well as transport unions. Research needs to be commissioned into the adequacy of safe accessible public transport for disabled people and their experience of using these services.**

Wheelchair users should be given an automatic legal right to a designated space on public transport.

Unite welcomed the previous Government's decision not to proceed with the abolition of the Disabled Persons Transport Advisory Committee (DPTAC) and to retain it as the Department for Transport's expert advisory panel on accessibility issues relating to disabled people. **DPTAC should now include, a previously, trade union representation on the committee.**

Affordable

Unite opposes cuts to concessionary fares for young, older and disabled people.

Rail fares have risen nearly three times faster than wages since 2010.³⁰ The Conservative/Lib Dem Coalition Government's Rail Fares and Ticketing Review failed to properly deal with high rail fare increases. The Government has announced plans to cap rises in regulated fares at the Retail Price Index (RPI) measure of inflation for this parliament. But the Department for Transport's own figures reveal the cost of the cap to taxpayers will be £700m³¹

Unite welcomed the Labour Party's 2015 Manifesto commitment to introduce **a strict fare rise cap on every route for any future fare rises, and for a new legal right for passengers to access the cheapest ticket for their journey.**

Government needs to restore the ban on train companies averaging out increases across a basket of fares.



The Government is also enabling train operating companies to increase many fares further through new longer franchises. For example, the new West Coast Inter-City franchise allowed the train operator to increase fares by up to 8% above inflation for 2013 and 2014 and then 6% above inflation increases every year for the rest of the fifteen year franchise.

Research commissioned by Action for Rail shows that public ownership could save £1.5bn over the five years to 2020, with savings passed on to passengers and taxpayers – season tickets alone could be 10 per cent cheaper by 2017.³² A third of the savings (£520m) would come from recouping the money private train companies pay in dividends to their shareholders.

Bus fares in the metropolitan areas have followed an upward trend in real terms since deregulation in 1986. The DfT bus fares index shows that since 2005, this trend has accelerated with bus fares in metropolitan areas increasing at more than twice the rate of inflation. Quality Contracts (which are discussed in more detail in the section on 'Challenging privatisation and deregulation') can help to address these problems by giving local authorities the power to set affordable prices.

Cuts have been made to the Bus Service Operators Grant (BSOG). BSOG helps to lower the cost of providing services, resulting in lower fares, a more comprehensive network of services, less congestion on our roads and a better and healthier living environment in our communities. BSOG generates at least £2.80 of benefits for every £1 of public money spent. Around half the benefits accrue to other road users and society at large through decongestion, reduced accidents, less pollution and improved productivity.³³

There must be no further cuts in BSOG which are having damaging and wide-ranging consequences for local communities, public transport services, low-income groups, the UK economy and the environment.³⁴

The UK charges passengers more in aviation tax than any other nation, to the extent that it can add several hundred pounds to the cost of a flight. This level of taxation is in addition to the requirement to pay for carbon credits under the European Emission Trading Scheme (ETS). This tax burden excludes some families from air travel and the opportunity to visit friends and relatives in other nations. It is now cheaper to travel by car and ferry to rival European hubs to catch a flight to destinations in India, Africa, the Caribbean and further afield than it is to pay this tax.

Integrated

A really effective and efficient transport system needs to be properly integrated. The idea of an "integrated transport policy" is not just jargon. All transport systems are interdependent. Bus networks need to interlink with rail networks or park and ride systems. Public transport requires transferrable ticketing and access to properly regulated taxis. Ports and airports need good road and rail links. Road, rail and water must work together to get people and goods to their destinations, cheaply, safely, efficiently and sustainably. Developments in port-centric logistics and airport location, for example, have an impact throughout the transport system.

Long term planning is essential. Strategic investment decisions and planning should be concerned not only with the speed and efficiency of the transport system, but whether it serves the actual needs of transport users. They should be concerned with the wider effects of transport on the local and national economy and with its effect on the environment.



²⁸ <https://www.gov.uk/government/publications/realising-the-potential-of-gb-rail>
²⁹ <http://www.independent.co.uk/news/uk/crime/rail-staffing-cuts-blamed-for-shocking-increase-in-passengers-being-attacked-on-britains-trains-10416174.html>
³⁰ <http://actionforrail.org/campaigners-protest-as-fares-rise-nearly-three-times-faster-than-wages/>
³¹ <http://www.parliament.uk/business/publications/written-questions-answers-statements/written-question/Commons/2015-05-27/96/>

³² https://www.tuc.org.uk/sites/default/files/TUC%20summary%20TfQL%20analysis%20March%202015_0.pdf
³³ <http://www.pteg.net/NR/rdonlyres/5F26BBD3-C4A4-4052-A453-D5BFE5E0F0B8/0/ptegCaseforbusreportFINAL.pdf>
³⁴ <http://www.bettertransport.org.uk/campaigns/save-our-buses>

Integrated transport needs proper planning. **Institutions with appropriate powers need to be established at national, regional and local level to co-ordinate strategic transport planning and deliver an integrated transport system.**

Accountable

Privatisation and deregulation have made transport services less accountable to the public. Private companies are accountable to their shareholders and privatisation places decision making in the hands of business and out of the control of public bodies and democratic institutions.

Transport decisions need to be taken at the appropriate level and through institutions that reflect the wide range of transport interests including passengers, community groups, unions, transport operators, local authorities, and environmental groups. Transport also requires a strong national transport authority capable of co-ordinating national strategic transport planning.

Unite recognises the role that Integrated Transport Authorities and Passenger Transport Executives can play in co-ordinating transport across regions and is keen to explore how these can best be developed.

Unite notes the Government's proposals concerning the regional devolution of transport powers announced in the Queen's speech 2015, including the Cities and Local Government Devolution Bill and the Buses Bill, which may provide for more effective oversight and control.

However, in the context of large scale public spending cuts, we are concerned that devolution could be seen as a means of transferring the responsibility for cuts to public services and public spending away from central government. For devolution to work, appropriate resources need to be put in place.

In addition, 'devolving' transport powers should not result in the damaging fragmentation of public networks or compromise the need for a properly accountable and integrated transport system.

PROMOTING PUBLIC TRANSPORT – Challenging privatisation and deregulation

An accessible, affordable, integrated and accountable transport system requires better regulation.

Privatisation and deregulation have damaged key parts of our transport sector. There needs to be a fundamental shift in transport policy away from further privatisation and deregulation and towards more public ownership and accountability, including our railways and our bus services.

In addition to the UK Government's privatisation agenda, Unite opposes the European Commission's drive towards further privatisation of transport through sector specific initiatives (such as 'Rail Package 4' and 'Ports Package 3') as well as more general measures such as the Concessions Directive.

Reregulation of buses

The privatisation and deregulation of bus services has led to falling passenger numbers, poorer quality services, 'bus wars' and high prices, and a lack of 'all operator' tickets in many areas.

Deregulation of the bus industry outside of London has not served communities well and whilst the regulated model in London has worked better, it is also flawed.³⁵

Public ownership of our buses would create a more integrated network of properly regulated bus services which would be run for the benefit of passengers rather than to provide excess profits for operating companies. It would lead to greater accountability, improved reliability and better value for money.

Whilst striving towards the ultimate goal of public ownership, the use of 'Quality Contracts', made possible by the Local Transport Act 2008 introduced by the last Labour Government, is a real opportunity to repair some of the damage done by deregulation and give more control to communities.

A Quality Contract involves replacing existing deregulated bus markets with a franchising system where the local transport authority specifies what the bus network will provide and the private sector operators tender to provide it. It gives local authorities the power to determine service delivery, set affordable prices and stipulate decent terms and conditions for bus workers.

As of yet no Quality Contracts have been established because operators do not want to surrender control over their profit margins. In addition, many local authorities are using Quality Contracts as a threat to make operators agree to inferior 'Quality Partnerships'. At the time of writing we wait with interest to see the outcome in Tyne and Wear of the Quality Contracts Board decision on whether to proceed with a Quality Contract.

Government should breakdown the obstacles surrounding implementation of Quality Contracts.

Unite notes the Government's proposals concerning the regional devolution of transport powers including the Cities and Local Government Devolution Bill and the Buses Bill. The Buses Bill would provide the option for combined authority areas with directly elected Mayors to be responsible for the running of their local bus services.

³⁵ <http://unitelive.org/londons-bus-workers-see-red/>

However, as mentioned earlier, in the context of large scale public spending cuts, **we are concerned that devolution could be seen as a means of transferring the responsibility for cuts to public services and public spending away from central government. For devolution to work, appropriate resources need to be put in place.**

Establishing independent evaluation of the impact on central funding of local government across the country with **the Office for Budget Responsibility should be required to produce 'state of the regional economy' reports**, stating levels of employment, deprivation and social hardship, thereby making it clear what baseline City Regions will be working from. City Regions should be judged on how they improve the situation that they inherit, rather than simply taking the blame for central government cuts.

Whilst managing change and transition between sectors, **full implementation of information and consultation and TUPE must be adhered to** at all times if bus workers and the travelling public are going to have faith in this system.

Public ownership of rail

The Government's plans for rail amount to another attempt to dismantle a key service in the pursuit of private profit at the expense of passengers and staff. This is the same ideology that led to the disastrous privatisation of the railways and seems designed to appease the interests of privatised train operating companies.

Rail franchising has proved to be fundamentally flawed and unsustainable with train operating companies (TOCs) gaining billions from taxpayers' subsidy.³⁶ The West Coast debacle³⁷ has shown the flaws inherent in rail franchising and has wasted millions of pounds of taxpayers' money.

A report by experts from the University of Manchester finds that rail privatisation has amounted to a 'great train robbery' and that the privatised rail system relies upon billions of pounds of hidden subsidies and has failed to bring in private investment.³⁸ It says that direct public expenditure on rail has more than doubled since privatisation and is currently running at £4 billion a year, despite fair rises which are now higher than in other major European countries.

The Government's pursuit of its privatisation agenda includes the privatisation of the East Coast Mainline. This is despite the fact it was working well in public ownership and since 2009 returned over £1 billion to the taxpayer.³⁹

Its ideological opposition to public ownership is limited to the UK, for whilst the government-owned company running the franchise was excluded from bidding, foreign state-backed railways were not. It is indeed "bizarre that Tory Ministers have no problem with a government-run railway service as long as it isn't British."⁴⁰

Unite welcomes the announcement by shadow transport secretary, Lilian Greenwood, that "it is time for our railways to be run under public ownership, in the public interest, with affordable fares for all".⁴¹

Further fragmentation will reduce efficiency leading to poorer services and higher fares. It will also have an adverse impact on the ability of the railways to contribute to economic growth and the reduction of carbon emissions. Unite opposes attempts to further fragment and privatise the rail system.

Public ownership of the railways would introduce efficiency from a more integrated and simplified system for passengers, increasing accountability and transparency.

A report by Transport for Quality of Life finds that £1.5 billion could be saved over the next five years (2015 – 2020) if routes, including the Northern, Transpennine and West Coast Main Line, were operated by the public sector. The Treasury would also be able to pass on massive savings to commuters in the form of far cheaper tickets.⁴²

Unite welcomed Network Rail being taken back under public ownership and is concerned at reports that the review being conducted by Nicola Shaw could lead to its re-privatisation.⁴³ **Unite opposes any proposal to break up Network Rail or attempts to privatise it.**

The Government should:

- **bring train operating companies back into the public sector** (which can be done at no cost as franchises expire or fail);
- **keep Network Rail in public ownership;**
- **shift from the expensive and wasteful rolling stock leasing system to buying trains outright and using government purchasing to support UK train manufacturing.**⁴⁴

Unite and the European Transport Workers Federation have also been active in highlighting the damaging consequences of the 'Rail Package 4' legislative proposals from the European Commission which will obstruct public ownership by requiring governments to put out to tender all passenger services.

Investment and regulation in ports and waterways

The UK's docks, ports and waterways are important parts of its transport system. Unite opposes the EU's 'Ports Package 3' proposals which aim to further drive liberalisation and would lead to a 'race to the bottom'. **These vital links to Europe require adequate investment and should not be put in the hands of those who might strip and sweat long term assets at the expense of the travelling public and British commerce.**

The move to ever larger ship sizes by shipping lines is focussing demand for more tugs whilst reducing the number of times they have work in any period. Together with increased competition from new tug operators, margins are being squeezed to the detriment of crew. Smaller ports are also losing traffic to the larger ports that are able to cope with the deep draft clearance of these ships leaving them dependant on short sea services.

The plight of smaller container ports is made worse by the numerous additional large port projects that are opening which has created significant over capacity and competition between ports for the shipping lines. At the present time, Unite therefore opposes any new deep sea port developments.

The canal network provides the opportunity to develop an environmentally friendly method of moving goods in certain regions. In addition, the network provides social and leisure benefits to many communities. However, the move of British Waterways in England to the charity sector has seen a weakening of attention paid to freight. **There should be no further transfer of the ownership of the canal network into a charity or to the private sector.**



³⁶ <http://www.tuc.org.uk/industrial/tuc-21519-f0.cfm>

³⁷ <http://www.guardian.co.uk/uk/2013/feb/26/mps-west-coast-mainline-department-transport>

³⁸ *The Great Train Robbery: Rail Privatisation and After*, Centre for Research on Socio-Cultural Change (2013) - <http://www.cresc.ac.uk/sites/default/files/GTR%20Report%20final%205%20June%202013.pdf>

³⁹ <http://actionforrail.org/the-attack-on-our-railways/keep-east-coast-public/>

⁴⁰ <http://press.labour.org.uk/post/62143017426/maria-eagle-mps-speech-to-labour-party-annual>

⁴¹ <http://press.labour.org.uk/post/130124189799/speech-by-lilian-greenwood-to-labour-party-annual>

⁴² https://www.tuc.org.uk/sites/default/files/TUC%20summary%20TfQL%20analysis%20March%202015_0.pdf

⁴³ <http://www.theguardian.com/business/2015/sep/20/network-rail-privatisation-under-consideration-amid-budget-crisis>

⁴⁴ <http://actionforrail.org/our-alternative/>

Better regulation of taxis

The previous Coalition Government asked the Law Commission to look at the possibilities for deregulating the taxi industry. This is despite the Transport Select Committee recommending that instead of referring reform to the Law Commission the Government should engage with the trade, local authorities and users about the objectives of future legislation on taxis and private hire vehicles.⁴⁵

Unite opposes further deregulation of the taxi industry and believes Local Taxi Boards made up of the licensing authority, trade unions, the police and passenger representatives (including disability and women's safety groups) should be responsible for the monitoring of supply and demand with the remit of developing the trade in a progressive and managed way.

Regulating private hire apps

Some private hire apps allow users to request a vehicle directly to their location at the press of a button with the fare being calculated and debited from a bank account automatically via a smartphone.

Unite believes that showing the position of vehicles on the app before the booking is made is a virtual hailing, effectively allowing plying for hire by private hire vehicles. This encourages private hire vehicles to park and wait for a booking, often illegally and to the frustration of residents and other road users.

Unite believes that it is wrong to allow private hire booking apps to display the location and estimated time of arrival (ETA) of vehicles on the user's phone before the booking is made. This is 'virtual' plying for hire without the vital safeguards to passengers that are in place for taxis with the local knowledge. Private hire booking apps should not be able to undermine progressive planning and safety in this industry through showing before any booking is made the position of available vehicles and the estimated time of arrival.



Cap on Private Hire Drivers and Vehicles in London

Unite believes a cap on private hire drivers and vehicles in London is overdue. The situation has led to greater congestion on London's roads, more air pollution and increased the problem of illegally parked vehicles. It has also damaged the livelihoods of the Hackney Carriage trade and made the streets of London more unsafe due to enforcement being over stretched.

Regulation of airports

In aviation, the Competition Commission forced through the break-up of BAA under the premise of introducing competition between airports. But a dependence on competition alone has not worked and the CAA has threatened the airports with caps on the amount they can charge airlines for landing fees increasing control over their activities.

In addition, the provision of aviation capacity through private airport operators has failed to deliver a coherent and cohesive strategy for aviation in the UK, thus inhibiting the fullest development of a key area of transport infrastructure and therefore curbing the potential benefits for the UK economy.

⁴⁵ <http://www.publications.parliament.uk/pa/cm201012/cmselect/cmtran/1507/1507.pdf>

Unite supports the adoption and implementation of an integrated policy for aviation which would be articulated nationally, internationally, and with other modes of transport. Key features would include a vibrant and self-sustaining regional aviation policy, combined with the continued presence and development of an international hub airport at Heathrow (as recommended by the Airports Commission). Such a policy would potentially combine a mix of public and private investment with a strong regulatory framework which would compensate for the lack of long term strategic decision making resulting from the 'free market' approach currently adopted.

A public road transport network that is safe and sustainable

The Government is moving towards privatising our road network including commercialisation of the Highways Agency which has now been rebadged as Highways England as a so called "go-co" government owned, contractor operated company. **Unite opposes the privatisation of our roads which are an integral part of our transport infrastructure.**⁴⁶ It makes no economic or environmental sense⁴⁶ and puts a key part of our infrastructure in the hands of companies seeking profits. Road pricing cannot operate in isolation from an integrated transport policy, including an understanding of the role of the road transport industry as part of a wider integrated transport policy including cycling and walking. Additionally, road pricing that charges drivers for using city centre roads would mean that those who can afford it are allowed to pollute.

The HGV levy in its first year of operation has raised a total £192.5 million in revenue, with £46.5 million from foreign-registered vehicles and £146 million from UK-registered vehicles. Revenue raised by the HGV levy is paid into the Consolidated Fund. It is not specifically ring fenced for transport infrastructure. Unite believes the **Government should ring fence HGV levy revenue in order to create a safe and sustainable transport infrastructure which improves, repairs and expands our roads.**

Any collection of payments by operators of non-uk registered HGVs should not be given to private contractors. There are maximum limits for road charging set through Europe so any increases would have to be linked directly to them. The **Charging levels must comply with the Eurovignette Directive** (Directive 1999/62/EC as amended by 2006/38/EC and 2011/76/EU) which sets out a framework of rules for tolls and charges, including maximum daily rates for the latter. **Unite is keen to ensure that the Government abides by this directive.**



⁴⁶ <http://www.taxresearch.org.uk/Blog/2012/03/19/the-madness-of-road-privatisation/>

SAFE TRANSPORT

Health and safety is a key concern across transport. Effective health and safety must not be a casualty of the economic crisis through the Government's pursuit of cuts and deregulation. Unite strongly condemns the Government's deregulatory agenda and the erosion of workers' rights and health and safety protection, including the scrapping of some health and safety regulations and HSE approved codes of practice (ACOPs), and the dilution of other ACOPs and HSE guidance. Unite does not accept the Government's downgrading of the transport sector as "lower risk".⁴⁷

Investment in transport must also mean that it is equipped to meet the highest safety standards. **EC directives and legislation on transport should be set to the highest standards operating within member states, without being unnecessarily complicated. Tri-partite transport sector developments at the ILO International Labour Organisation agreed by governments, unions and employers are also important.**

The safety of transport users is closely linked to the safety of transport workers. For example, Unite is calling for **proper implementation of the European driving hours regulations in the UK where bus drivers in the UK** are driving for longer periods and over greater distances than their European counterparts.⁴⁸ This is not only a matter of concern for bus drivers but for public safety on our roads.

The safety and health of transport workers is being adversely affected by the lack of adequate toilet and washing facilities, which has been made worse by the closure of many public facilities. **Professional drivers must have access to high quality, clean, safe and secure washing facilities throughout the road network.**

Long working hours and inappropriate rest facilities are an issue in other areas too. For the country's HGV drivers, loopholes in the Working Time Directive (in respect of periods of availability, for example) are promoting a 'long hours' culture. Excessive working time is also a reflection of inadequate pay and a reduction in working hours should not compromise decent pay. Unite is campaigning for better enforcement of drivers' working hours rules and has also put forward a 'model' truck stop facility.⁴⁹ In civil aviation, we have highlighted the dangers to staff and passengers of inadequate rest periods. **Safe transport requires proper rest periods and rest facilities for transport workers such as drivers.**

Another issue is drivers' cabs which, despite being their working environment, are still not deemed to be their workplace. **Drivers' cabs should be brought under the provisions of the relevant health and safety legislation.** The use of technology-driven Labour Management Systems in warehousing, logistics and to excessively monitor transport workers is leading to increasing levels of work intensification, stress and mental health issues.

There needs to be protection against fatigue for transport workers, particularly in road transport and civil aviation, through stronger regulation and proper enforcement of driving, working and duty hours, including ending the abuse of Working Time Regulations by unscrupulous employers through 'periods of availability'. The impact of related stress and mental health issues in the transport sector needs action.

Safe loading procedures in all modes of transport are also essential for passenger and transport worker safety. They should not be compromised in a 'race to the bottom' to cut costs.

Unite has also drawn attention to the mounting concern about exposure of diesel exhaust emissions as a workplace health and safety and public health issue. **The Government should act upon the upgrading by the International Agency for Research into Cancer of diesel engine exhaust to a Group 1 carcinogen - carcinogenic to humans – and ensure that health and safety regulatory activity fully and actively reflects this finding.**

Unite and others have also raised concerns about the effect of exposure to carcinogenic compounds in aviation both on board aircraft and on the ground.⁵⁰ **Government should act on these concerns.** Unite is also campaigning on air quality on aircraft and in airports, including the effects of ultrafine particles, and the weight, movement and stowage of passenger luggage.

Concerns about a race to the bottom in terms of employment conditions and health and safety were vividly drawn to the public's attention by Unite's downstream oil distribution driver members in 2012. Unite's action has led to the introduction of a 'Petroleum Drivers' Passport (PDP)' (see further details in section on 'Decent employment standards' below). By contrast, Unite has still to gain recognition at the deep-sea container port in the Thames estuary, the London Gateway, despite the fact union recognition reinforces health and safety issues.



Petroleum Driver Passport

Docks remain one of the most dangerous industries to work in. Unite is leading in highlighting the serious consequences of the Coalition Government's downgrading of the safety level of docks and the scrapping of the Docks Regulations.

Unionised workplaces with active health and safety representatives are safer workplaces⁵¹ and the importance of safety to the success of transport should be reflected in the **support and rights available to union health and safety representatives including the ability for 'roving' health and safety reps to cover a number of places of work. Workplaces need health and safety cultures which encourage the reporting of concerns by workers without fear of victimisation or financial loss.**



⁴⁷ See page 9 of *Good Health and Safety, Good for Everyone*, DWP (2011) - <http://webarchive.nationalarchives.gov.uk/+/http://www.dwp.gov.uk/docs/good-health-and-safety.pdf>

⁴⁸ <http://www.unitetheunion.org/uploaded/documents/BusSaferWay11-3896.pdf>

⁴⁹ The *Unite Professional Drivers' Handbook* contains details about key European and domestic health and safety rules and issues including drivers' hours and tachograph matters

⁵⁰ <http://www.unitetheunion.org/news/unite-chief-in-public-inquiry-call-to-allay-health-fears-over-cabin-air-safety/>

⁵¹ *The Union Advantage*, TUC (2014) - https://www.tuc.org.uk/sites/default/files/TUC_UnionADV2.pdf

DECENT EMPLOYMENT STANDARDS

The value of unions and union representatives is widely recognised in ensuring decent and fair standards in a range of areas in addition to health and safety. Transport workers' experience of the deregulation and liberalisation of the sector is an undermining of standards, a 'race to the bottom' and attacks on trade union organisation. Trade unions act as an important safeguard against free markets and unscrupulous employers.

Unions need to be involved in issues that affect work organisation such as the development of large transport hubs and the introduction of new technology to ensure that safety, service and well-being are not compromised by pressure to cut costs and a 'race to the bottom'.

The transport sector is also subject to a rise in precarious employment through practices such as zero hours contracts and outsourcing. Migrant workers and agency workers are subject to unfair treatment. For example, some employers in areas such as road haulage are, in conjunction with agency business, avoiding giving equal treatment on pay to agency workers through the use of so-called 'Swedish Derogation' contracts.

Government should remove all loopholes in the Agency Workers Regulations and ensure they are properly complied with and not circumvented through practices such as 'Swedish Derogation' contracts and zero-hours contracts.

In road transport, cabotage regulations need to be properly enforced and EU pressure for further deregulation needs to be resisted.

Unions ensure employment rights are not only enforced, but that steps are taken to prevent problems and promote fair and decent standards and treatment. This includes extending workers' access to learning and skills, fair and safe work organisation and working time, productivity and pay, pensions, procedures for sickness, holidays, family friendly policies, discipline and grievance. Such actions can reduce labour turnover and absenteeism, make workplaces - and society more broadly - fairer and more equal, and improve job satisfaction and employee engagement.⁵²

This Conservative Government continues to pursue an ideologically driven anti-union agenda that has sought to undermine the effectiveness of unions through attacks on employment legislation and trade union

facility time. This is no better illustrated than by the Trade Union Bill with its attacks on the ability of working people to defend and improve their working conditions⁵³ including attacking the right of transport workers to take strike action. **Unite opposes the undermining of basic rights and freedoms in the Trade Union Bill.**

Transport needs a properly protected workforce and this requires proper protection and facilities for trade union representatives.

Unite condemns the blacklisting and victimisation of trade unionists by employers. **Government policy should strive to stamp out blacklisting activities and blacklisting should be publicly repudiated by those awarding and competing for contracts in the transport sector. No public contracts should be awarded to those engaging in such practices.**

Unite's efforts to promote stability, security and responsibility in the transport sector include dealing with the fragmentation of the fuel oil distribution industry and has led to the introduction of the 'Petroleum Drivers' Passport' (PDP), which now covers over 6,000 tanker drivers across England, Scotland and Wales and establishes an Industry Training Standard for health, safety and driver training, with appropriate means of accreditation.⁵⁴ The training is a mixture of classroom and practical learning. The passport is renewed on a five year cycle, but also has an annual refresher requirement and will see fuel depots and refineries refusing to load tankers whose drivers do not hold a PDP.

Unions have a positive impact on skills and training, particularly where there are union learning representatives (ULRs). Union recognition has a consistently positive effect, not only to the extent that employees are provided with training but also on the amount of training received.⁵⁵

Unite has successfully negotiated with many employers for drivers to be paid whilst conducting Driver Certificate of Professional Competence (CPC) training. There is no legal requirement for employers to do so and some employers pay for the training itself but not their drivers' working time whilst undergoing training. In the absence of a formal framework for workers' representatives, employers and government to develop this, Unite has also been delivering its own Driver CPC training to members. Unite would also be supportive of initiatives from relevant governing bodies to introduce a Warehousing CPC.

Government and industry should fund real training initiatives which will promote real skills, equal opportunities, and improve future transport efficiency and safety. We need properly regulated National Professional Standards and trade union involvement in all training bodies.

Compulsory Driving Licence Checks

It is a legal obligation for an operating licence holder to ensure that drivers they employ are eligible to drive. For most this is not a problem, but since the abolition of the driving licence paper counterpart in June 2015 some employers have had to revisit their procedures.

Information held by DVLA regarding driving entitlements or endorsements is personal data covered by the Data Protection Act 1998 and there are rights over who can access that information and for what reasons. Employers may have a legal obligation to check eligibility to drive and may request evidence. Unite has issued guidance on driver licence checks and the need to consider the safety of personal data.⁵⁶ In many companies Unite members are covered by an existing agreement which is working. However, **agreements on compulsory driving licence checks should be updated periodically, especially relating to who can access the information, how the information is stored and for how long.**



⁵² *The Road to Recovery*, TUC (2010) - <http://www.tuc.org.uk/economy/tuc-17727-f0.cfm?themeaa=touchstone&theme=touchstone>
⁵³ <http://www.unitetheunion.org/uploaded/documents/Trade%20Union%20Bill%20Briefing%20Paper11-23961.pdf>

⁵⁴ <http://www.unitetheunion.org/how-we-help/list-of-sectors/road-transport-commercial-logistics-and-retail-distribution/the-petroleum-driver-passport-scheme/>

⁵⁵ *The Union Advantage*, TUC (2014) - https://www.tuc.org.uk/sites/default/files/TUC_UnionADV2.pdf

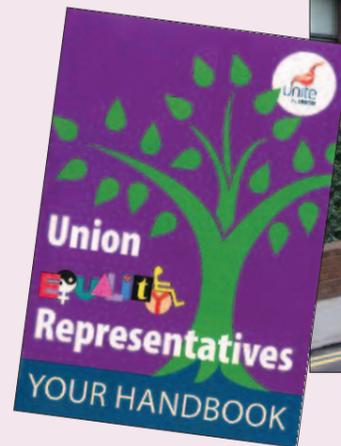
EQUALITY AND PROTECTION FROM VIOLENCE FOR TRANSPORT WORKERS

In addition to the importance of transport to equality in society and to access for disabled people, there are important equalities issues for workers in the transport sector, which are also important to the diversity of passengers and the public generally.

The transport and storage sector already has one of the worst records of employing women, with men accounting for 80 per cent of the sector workforce compared to 54 per cent across the economy. It is also one of the most poorly qualified.⁵⁷ Training and regulation are vital in guarding safety and as an investment in skills for the future. Closure of training not only hits skills but equal opportunities.

Unite has supported and led initiatives in this area, including:

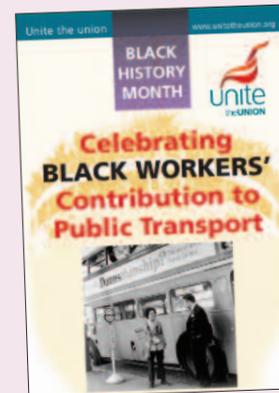
- tackling under-representation of women workers in bus, rail and road haulage;
- tackling barriers to progression faced by black, Asian and ethnic minority workers in transport;
- supporting positive action training, including basic skills and language training;
- dignity at work, action on violence against women and against all transport workers, including recognition of cabin crew as safety and security professionals;
- training for transport workers on disability awareness and action including mental health at work;
- ensuring travel concessions apply to same sex partners of transport workers without discrimination;
- trade union and employer training on equal opportunities, equality impact assessments and audits;
- negotiating agreements for a plan of action to support trans workers in transport;
- promoting rights for union equality representatives.



The transport sector's poor record on employment levels for women and black, Asian and ethnic minorities (BAEM) needs positive workplace policies that support women's participation and BAEM progression. This includes family friendly policies and better scheduling of work patterns (which would also assist male parents and carers and reduce stress) and positive training opportunities.

Union equality representatives play a vital role recognised by a number of transport employers as well as by ACAS and the Women and Work Commission. In order to ensure fairness and equality at work, union equality reps should have statutory rights to paid time off and facilities.

Clear confidential procedures supported by union education and workplace awareness are vital in preventing and dealing with harassment, bullying and violence in all forms. Action on white ribbon day, 25th November 'Say No to Violence against Women', and in Black History Month, for example, have an important part to play.



Jeff Hurd, reportdigital.co.uk



Roy Peters, Roy Peters Photography

⁵⁷ www.ukces.org.uk/assets/ukces/docs/publications/briefing-paper-ssa12-transportation-storage.pdf

A MORE SUSTAINABLE TRANSPORT SYSTEM THAT IS BETTER FOR THE ENVIRONMENT

Transport accounts for around 21% of UK greenhouse gas emissions, with road transport, and passenger cars in particular, the most significant source of emissions in this sector.⁵⁸

Reducing greenhouse gases from transport will be a major part in meeting the UK's commitment to reducing greenhouse gas emissions by 80% compared to 1990 levels by 2050. This will not only require action to 'decarbonise' transport and develop emission reducing technologies, it will also depend on persuading people to make travel choices that are less environmentally damaging.⁵⁹

Initiatives to reduce emissions must also have proper regard for health and safety. A 10 year trial into the use of high volume semi-trailers on Britain's roads has so far resulted in a lower than expected take up and initial evaluation reports that there is not yet sufficient data to perform any meaningful analysis.⁶⁰ Unite is concerned that due to increased length there is an associated increased risk to workers and members of the public when these vehicles are manoeuvring.

As mentioned in the foreword, there is a clear international dimension to dealing with global climate change and Unite is working with the International and European Transport Workers' Trade Union Federations (ITF and ETF) to promote a coordinated approach to sustainable transport initiatives across countries, including the Climate Justice and Trade Union Vision on Sustainable Transport projects.⁶¹

The ITF is committed to representing the joint interests of transport workers to secure a just transition to a sustainable transport system based on secure jobs, good wages and decent working conditions.⁶² Whilst we recognise that we cannot think in isolation, this should not prevent the UK from taking a lead or addressing its own challenges.

Regulation and procurement practice needs to support a sustainable transport industry by enabling longer term considerations, and ensuring social and environmental goals as well as economic growth.

Investment is needed to support research into technology for minimising the pollution effects of transport, such as cleaner fuels and electric cars, which is important to communities and transport workers.

In aviation many nations are exploring biofuel alternatives from non-agricultural sources that do not reduce the amount of land used for food production or destroy the rain forests.



⁵⁸ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/407432/20150203_2013_Final_Emissions_statistics.pdf

⁵⁹ *British Social Attitudes 2012 - Transport*, <http://www.bsa-29.natcen.ac.uk/read-the-report/transport/introduction.aspx>

⁶⁰ Evaluation of the High Volume Semi-Trailer Trial: Annual Report 2012, Report for Dft by Risk Solutions (2013) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/204084/hvst-trial-annual-report-2012.pdf

⁶¹ <http://www.itfglobal.org/policy/climatejustice.cfm> and <http://www.etf-europe.org/transunion-climate.cfm>

⁶² <http://www.itfglobal.org/en/resources/training-education/itf-climate-change-conference-discussion-document/>



Unions also have a particular role to play in promoting and delivering a sustainable environment through environmental representatives and 'green workplace' initiatives. At the Port of Felixstowe, for example, Unite has been active on environmental issues with the senior union steward and environment representative sitting on a joint union-management environmental committee whose work has led to a reduction in the port's carbon footprint and increase in its recycling rate.⁶³ Work has also included supporting green travel, again with union representation on the port's Travel Steering Group.

The union role in delivering a sustainable environment needs to be supported through statutory rights for training and facility time for all trade union environment reps.

But there also needs to be a move towards a transport system based on much greater use of public transport, cycling and walking. Disincentives to car use will only be effective or fair when there is a low-cost, clean, safe and convenient public transport alternative and active support for cyclists and pedestrians.

Unite supports aviation's inclusion in the EU Emissions Trading Scheme (ETS) which applies to every airline calling at a European airport. However, the scheme can provide a financial advantage to transatlantic routes that avoid Europe and emit more greenhouse gases. Consequently, Unite believes that **there should be a global emissions trading scheme for civil aviation. The introduction of aviation ETS should lead to the abolition of Air Passenger Duty (APD) as it has done in other European states.** If APD is to be maintained, however, then the revenue stream should be hypothecated and used for environmentally friendly civil aviation projects, i.e. research and development and implementation of new operational practices and technology. There should also be a harmonised application of APD throughout the UK.

The free-for-all of the cabotage market within automotive delivery in road haulage, which will see non-UK registered hauliers from continental Europe 'running empty' for longer, should be replaced with **a planned and intermodal freight strategy based on environmental and economic efficiency.**

Sustainable transport requires proper planning. It also requires investment, effective regulation, smart procurement policy and better integration of transport modes. All of these issues are considered in more detail elsewhere in this report, but this further demonstrates the need for government to have a comprehensive and clear transport strategy that connects relevant policy areas.

⁶³ *Green Workplaces at Work 2012*, Labour Research Department and TUC (2012)

CONCLUSION:

SUMMARY OF KEY POINTS AND RECOMMENDATIONS

Strategy

Government needs to have a clear, integrated and sustainable transport strategy that recognises the importance of transport to society, the economy and the environment, as well as the key role played by transport workers.

This strategy should include:

- a commitment to investment;
- accessible, affordable, integrated and accountable public transport;
- a fundamental shift away from further privatisation and deregulation;
- safe transport with decent employment standards, equality and protection for transport workers;
- a sustainable transport system that is better for the environment.

Investment

- A commitment to investment. Public investment must at least match the best international levels.
- Invest immediately in modernising our transport infrastructure system to boost productivity and build a sustainable economy.
- Deliver in a sustainable and accessible way on commitments made for the high speed rail network.
- Ensure an effective hub airport in an environmentally sustainable manner and address the lack of airport capacity in London and the South East by acting swiftly on the Airports Commission recommendation for a new runway at Heathrow.
- Fair and effective procurement. Contracts must include social impact clauses and ensure fairness for British based manufacturing and the supply chain.

Transport for All

- The social value of transport needs to be explicitly considered in policy-making and in the planning system.
- Concessionary travel policy should ensure that anybody unable to make use of their concession on existing eligible transport services should be permitted to use it on other transport services.
- Ensure that public transport fulfils its important social function by being integrated, accessible, affordable and accountable for all.

Accessible

- Properly consult with passenger groups and user organisations.
- Research into the adequacy of safe accessible public transport for disabled people and their experience of using these services.
- Wheelchair users given an automatic legal right to a designated space on public transport.
- The Disabled Persons Transport Advisory Committee (DPTAC) should include, as previously, trade union representation.

Affordable

- No cuts to concessionary fares for young, old and disabled people.
- A strict fare rise cap on every route for any future fare rises and a new legal right for passengers to access the cheapest ticket for their journey.
- Restore ban on train companies averaging out increases across a basket of fares.
- No cuts in the Bus Service Operators Grant (BSOG) which are having damaging and wide-ranging consequences for local communities, public transport services, low-income groups, the UK economy and the environment.

Integrated

- Institutions with appropriate powers at national, regional and local level to co-ordinate strategic transport planning and deliver an integrated transport system.

Accountable

- Transport decisions taken at the appropriate level and through institutions that reflect the wide range of transport interests including transport unions.
- Explore how the role of Integrated Transport Authorities and Passenger Transport Executives can be developed in co-ordinating transport across regions.
- City devolution may provide for more effective oversight and control, but should not be a means of transferring the responsibility for cuts to public services away from central government. For devolution to work, appropriate resources need to be put in place.
- 'Devolving' transport powers should not result in the damaging fragmentation of public networks or compromise the need for a properly accountable and integrated transport system.
- Office for Budget Responsibility to produce 'state of the regional economy' reports.

Challenging privatisation and deregulation

- Shift in transport policy away from further privatisation and deregulation and towards more public ownership and accountability, including our railways and our bus services.
- Oppose the European Commission's drive towards further privatisation of transport through sector specific initiatives (such as 'Rail Package 4' and 'Ports Package 3') as well as more general measures such as the Concessions Directive.
- Break down the obstacles surrounding implementation of Quality Contracts.
- Bring train operating companies back into public ownership.
- Oppose any proposal to break up Network Rail or attempts to privatise it.
- Use government purchasing to support UK train manufacturing.
- Provide adequate investment in the UK's docks, ports and waterways which should not be put in the hands of those who might strip and sweat long term assets at the expense of the travelling public and British commerce.

- No further transfer of the ownership of the canal network into a charity or to the private sector.
- Local Taxi Boards made up of the licensing authority, trade unions, the police and passenger representatives (including disability and women's safety groups) responsible for the monitoring of supply and demand with the remit of developing the trade in a progressive and managed way.
- Private hire booking apps should not be able to undermine progressive planning and safety in the industry through showing before any booking is made the position of available vehicles and estimated time of arrival.
- A cap on private hire drivers and vehicles in London.
- An integrated policy for aviation articulated nationally, internationally, and with other modes of transport. Key features would include a vibrant and self-sustaining regional aviation policy, combined with the continued presence and development of an international hub airport at Heathrow (as recommended by the Airports Commission).
- No privatisation of our roads which are an integral part of our transport infrastructure.
- Ring fence HGV levy revenue in order to create a safe and sustainable transport infrastructure which improves, repairs and expands our roads.
- Any collection of payments by operators of foreign-registered HGVs should not be given to private contractors.
- The Government must comply with the Eurovignette Directive in respect of road charging.

Safe transport

- EC directives and legislation on transport set to the highest standards operating within member states, without being unnecessarily complicated. Tri-partite transport sector developments at the ILO International Labour Organisation agreed by governments, unions and employers are also important.
- Proper implementation of European driving hours regulations in the UK.
- Professional drivers must have access to high quality, clean, safety and secure washing facilities throughout the road network.
- Proper rest periods and rest facilities for transport workers such as drivers.
- Drivers' cabs brought under the provisions of the relevant health and safety legislation.
- Stronger regulation and proper enforcement of driving, working and duty hours including ending the abuse of Working Time Regulations by unscrupulous employers through 'periods of availability'. The impact of related stress and mental health issues in the transport sector needs action.
- Safe loading procedures in all modes of transport. They should not be compromised in a 'race to the bottom' to cut costs.
- Ensure health and safety regulatory activity fully reflects recent upgrading of diesel engine exhaust as carcinogenic to humans.
- Action on concerns about the effect of exposure to carcinogenic compounds in aviation both on board aircraft and on the ground.
- Maintain proper level of safety in our docks and ensure dock safety regulations.
- Support and rights for union health and safety representatives including the ability for 'roving' health and safety reps to cover a number of places of work.
- Workplaces with health and safety cultures that encourage the reporting of concerns by workers without fear of victimisation.

Decent employment standards

- Remove all loopholes in the Agency Workers Regulations and ensure they are properly complied with and not circumvented through practices such as 'Swedish Derogation' and zero-hours contracts.
- In road transport, cabotage regulations need to be properly enforced and EU pressure for further deregulation needs to be resisted.
- Oppose the undermining of basic rights and freedoms in the Trade Union Bill.
- Proper protection for transport workforce with proper protection and facilities for trade union representatives.
- Government policy should strive to stamp out blacklisting of trade unionists and blacklisting should be publicly repudiated by those awarding and competing for contracts in the transport sector. No public contracts should be awarded to those engaging in such practices.
- Government and industry funding for real training initiatives which will promote real skills, equal opportunities, and improve future transport efficiency and safety.
- National Professional Standards and trade union involvement in all training bodies.
- Agreements on compulsory driving licence checks should be updated periodically, especially relating to who can access the information, how the information is stored and for how long.
- Full implementation of information and consultation and TUPE must be adhered to.

Equality and protection from violence for transport workers

- Positive workplace policies that support women's participation including family friendly policies and better scheduling of work patterns (which would also assist male parents and carers and reduce stress).
- Union equality representatives play a vital role recognised by a number of transport employers, ACAS and the Women & Work Commission. In order to ensure fairness and equality at work, union equality representatives should have statutory rights to paid time off and facilities.
- Initiatives to encourage the progression of BAEM workers.
- Clear confidential procedures supported by union education and workplace awareness are vital in preventing and dealing with harassment, bullying and violence in all forms. Action on white ribbon day, 25th November 'Say No to Violence against Women', and in Black History Month for example have an important part to play.

A more sustainable transport system that is better for the environment

- Regulation and procurement practice to support a sustainable transport industry by enabling longer term considerations, such as social and environmental goals, to be more considered as well as economic growth.
- Investment to support research into technology for minimising the pollution effects of transport, such as cleaner fuels and electric cars.
- Statutory rights for training and facility time for trade union environment representatives.
- A transport system based on greater use of public transport, cycling and walking.

- A global emissions trading scheme for civil aviation.
- The abolition of Air Passenger Duty (APD). If maintained, then should be used for environmentally friendly civil aviation projects and there should be harmonised application throughout the UK.
- A planned and intermodal freight strategy for automotive delivery, fuel delivery and all road haulage that is based on environmental and economic efficiency.

UNITE TRANSPORT STRATEGY GROUP

Passenger Transport

National Industrial Sector Committee Chair – Taj Salam
 National Industrial Sector Committee Vice-Chair – Mike Hedges
 Executive Council Members – James Mitchell, Simon Rosenthal
 National Officer – Bobby Morton

Road Transport Commercial, Logistics & Retail Distribution

National Industrial Sector Committee Chair – Ronnie Evans
 National Industrial Sector Committee Vice-Chair – Tony Lewington
 Executive Council Members – Dave Williams, Gary Hillier
 National Officers – Adrian Jones, Matt Draper, Tony Devlin (downstream oil distribution)

Civil Air Transport

National Industrial Sector Committee Chair – Brian Norbury
 National Industrial Sector Committee Vice-Chair – John Pigott
 Executive Council Members - Sharon Owens, Nigel Stott, Jas Gill
 National Officer – Oliver Richardson

Docks, Rail, Ferries & Waterways

National Industrial Sector Committee Chair – Richard Crease
 National Industrial Sector Committee Vice-Chair – Martin Jones
 Executive Council Member – Andy Green
 National Officers – Bobby Morton, Tony Murphy (Rail)

Assistant General Secretary Transport

Diana Holland

Transport Research – John Earls (Head of Research), John Neal, Colin Potter
Equalities Research – Anooshah Farakish
National Health & Safety Adviser – Susan Murray

Support the Fair Transport Europe campaign

Fair Transport is fair competition, equal working conditions and good jobs

Unite is proud to support the Fair Transport Europe campaign being run with the European Transport Workers Federation.



As long as we cannot send an apple, a pair of shoes or ourselves by email, we need the millions of transport workers who connect Europe. But working conditions in European transport are being challenged by a race to the bottom and unfair business practices by some companies, causing deplorable conditions for workers.

Fair Transport is fair competition, equal working conditions and good jobs.

Fair Transport benefits all of us. We need your support in a call for better legislation and enforcement of regulations in Europe.

In order to do this, we need to obtain as many supporting signatures as possible.

A central tool for the Fair Transport Europe initiative is the EU instrument called the "European Citizens' Initiative" (ECI). If at least one million EU citizens sign the petition, we can call on the European Commission to make the necessary legislative proposals for more fair transport.

Let's make things better. Sign for Fair Transport.

To sign for Fair Transport and find out more about the campaign go to: www.fairtransporteurope.eu



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UCL

Response to
National Infrastructure Commission's
Call for evidence:
London's Transport Infrastructure

University College London

January 2016

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1. Executive Summary

This document consolidates the response of the academic community at University College London (UCL) to the National Infrastructure Commission's call for evidence regarding future investment in London's transport infrastructure (published 13 November 2015).

In response to *Question 1) what are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?*, we noted the issues around London's housing market and demographics. Whereas London's housing market is becoming a field for financial game by investors, the potential risk would be that expensive house prices/rents would discourage young generations from coming into London, although they are in fact an engine of London economic development. A step change would be required on our approaches to these, which should be synthesised with transport planning, including use of Residential Social Landlords who do not need short-term returns but provide a platform for financially less advantaged people. A local council tax supplement could be another means.

In response to *Question 2) What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?*, this report highlights opportunities regarding orbital transport systems as well as rail systems that go beyond the traditional boundaries of London, which should be integrated to the proposed radial and through-centre systems, such as Crossrail 2. Because Train Operating Companies cannot consider investment and return beyond their franchise periods, appropriate arrangements are necessary from long-term strategic viewpoints. In addition, consolidation of existing train depots as well as multiple-platforms at the core section are suggested to maximise the benefit of the proposed Crossrail 2.

For *Question 3) What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2*, we suggest a) line-based fare surcharge, adapted in Tokyo, b) use of the Games 2012 Tax system, and c) consolidation of infrastructure development and train operation when contracting out the project. Separating station infrastructure development and maintenance from the construction of the line, and bringing private funds to the station infrastructure is one possible approach. China is experimenting privately funded metro station maintenance by local homeowners, whereas in the Maglev train line of Japan stations except termini are all funded by private companies and local governments. These are also possible approaches.

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2. Research Capability at University College London

UCL is a global research leader in the design, delivery and management of sustainable and resilient infrastructure.

UCL holds some £57M of funding, from the UK Engineering & Physical Sciences Research Council (EPSRC) alone, for research on infrastructure related challenges in the transport, energy and construction sectors. UCL's research strengths in the field are truly multidisciplinary, spanning: transport engineering, structural engineering, advanced spatial analysis and big data analytics, construction and project management, sensors and geomatic engineering, and socio-technical energy modelling and analysis. Major centres of excellence at UCL include the Centre for Advanced Spatial Analysis (CASA), the Centre for Transport Studies (CTS) within the Department of Civil, Environmental & Geomatic Engineering, the cross-Faculty Transport Institute, and the OMEGA Centre for Mega Projects in Transport & Development, based in the Bartlett School of Planning.

In the 2014 Research Excellence Framework, UCL was the top-rated university in the UK for research strength, by a measure of average research score multiplied by staff numbers submitted. It was ranked number in the UK in the area of Architecture, Built Environment and Planning (Unit of Assessment 16), and the in top ten in the field of Civil and Construction Engineering (UoA 14).

UCL is home to the EPSRC and ESRC funded International Centre for Infrastructure Futures (ICIF), as well as the Coordination Node of the £138M UK Collaboratorium for Research in Infrastructure & Cities (UKCRIC), led by Professor Brian Collins from the Department of Science, Technology, Engineering & Public Policy (STeAPP). Announced by the Chancellor in 2015, UKCRIC spans at least 14 universities and will lead the development of a coordinated, world class, infrastructure research community in the UK. UCL will take charge of infrastructure aspects of the £10M EPSRC-funded Internet of Things Research Hub (PETRAS), announced in early 2016, as well as its overall leadership under Hub Director, Professor Jeremy Watson (STeAPP).

3. Response to Questions regarding London's Transport Infrastructure

3-1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

[Response 1]

London's success as an economic, political, cultural and social centre is well understood and London's history and current dominant position both nationally and globally would strongly suggest that it has enduring characteristics that allow the next thirty years to be considered with some confidence.

With this as a non-controversial backdrop, the future of London can be speculated upon by drawing on a UCL authored report that itself drew upon both a day-long workshop involving senior representatives from the UK built environment and supplemental authoritative sources (UCL, 2015). The report is available electronically here:

http://issuu.com/ucl_cpm/docs/changing_demographics_151127.

Throughout the report there is repeated reference to London's potent attractiveness. This means that both London and its environs will continue to attract individuals, organisations and investment. The report had limited scope and only focuses on three forms of the built environment comprising key elements of our social infrastructure: housing, healthcare and education. To the intelligent and well-informed reader there will be nothing of great surprise as many of London's challenges are well understood. However, three issues or topics are worthy of highlighting:

- 1) That the housing problem that the UK is experiencing is the result of the 'game' played in, and through, housing and the type of players in this game. The UK housing game is distinct – it sees housing as being a social necessity (we all need somewhere safe and secure to rest) and, ideally and in terms of aspiration, our (citizens') biggest financial investment. This housing game is played out within a strict planning rule-set, now with a far more onerous financial set of challenges in terms of obtaining a standard and traditional mortgage. The current and recent result of the game played and its rules is the social utility of housing is overshadowed by the financial return – so housing moves from a fundamental social provision to a financial asset and resulting investment strategy. This game attracts a specific type of player in terms of supply. Rather than housing being seen as social right, it has become dominated by those seeking either asset appreciation or derived income from this asset. And here, to compound the issue, the asset is not the house or dwelling, but the land rights that are entwined with the dwelling. With strict limits on land use, the result of increasing demand is that those in control of developable land choose how, where and when to release that land (with housing built on it) so as to maximise their returns. Those able to buy such housing can, and do, store or even stockpile the financial asset without ever seeking to generate any form of social utility from it. This then has serious disruption and displacement effects. With this game in play, the rules of the game set and understood, and the players we have – there is no indication that anything significant will change over the next 20-30 years. Three strategic options are proposed for consideration:
 - a. Change the game – decouple the provision of housing as a social utility from that of a prime financial asset. Here there needs to be a cultural shift to the acceptance of

long-term stable renting as is found in many parts of Europe. It is possible and for some young Londoners this is already a reality. In terms of meeting this possible demand, there is evidence from sub-sectors such as student accommodation that institutional investors are attracted to stable renters. The shift will have to be mainly in dissuading the younger generation that owning their own home is the mark of true Britishness.

- b. The rules can be changed, most notably around the protection of the Green Belt, but this would be highly divisive. The move to allow 'permitted development' to bring into active use redundant office space has had large unexpected consequences as active offices were converted – again this creating displacement and disruption.
 - c. New players can be attracted to 'the game' via changing fiscal and other regulatory rules. This could be through strengthening those Residential Social Landlords as represented by bodies such as the Peabody Trust. This 'third sector player' approach, being neither private sector returns driven, nor overtly public sector, could take a long-term stable view and, if given access to land and title over the property, would have a substantial capital asset base on which to borrow and invest.
- 2) That technological advances will allow or indeed encourage more and more kinds of activity to take place in our homes. London is primarily a location for work derived from knowledge and as ICT becomes more pervasive and powerful, so knowledge workers will have options as to where to communicate in person or digitally. The trajectories of retail is telling – it has made the move online and this trend is set to continue as more shopping is done online. Similarly social exchange is taking place on digital platforms, and over the next 20-30 years we can expect more 'telecentric' health and education services to appear and become routine. Online learning is already established. In health, the cheap and easily installed monitoring and sensing technologies will enable remote healthcare – of both preventative (wellbeing) and response (remedy).
- 3) As a result of both technological shift and the possibility of more fear as a result of more crowding and the rise of extremism, there is a realistic prospect of strata of London's population retreating to their homes. This then may see London occupied more by visitors and tourists than it is by those living and working in London. This occurred in small measure during the 2012 London Olympic Games, and this may shift established daily and seasonal patterns of movement.

[Response 2]

One great indicator of - and clear factor in - London's success as a global city of entrepreneurial and cultural excellence is its ability to attract young people to live and work in the city. Young people flock to London, bucking the trend in terms of net migration to London, with 20-29 year olds the only age group demonstrating a net positive inflow into London from other UK regions (ONS, 2013). Other age groups on balance leave London, to the South East in the large part, continuing to contribute to the economy but not adding the same dynamism as younger groups. London is also sustained through immigration of foreign-born nationals, who, contrary to media reports, are highly skilled and contribute positively to productivity (LSE, 2007). The development of London must ensure its continued attractiveness to these groups.

A significant challenge towards maintaining these benefits is finding places for people to live in and around London. The trend of increasing house prices in central and inner London does not look like abating any time soon, for a wide range of reasons. Twinned with a limited capacity for building new housing in central areas, will mean outer London and commuter belt towns become the only viable option for many of those wishing to move to or buy in London. As Marchetti's Constant (Marchetti, 1994) (and subsequent research from Zahavi, 1973, and Metz, 2008) shows, people are happy to travel further and further to work, but they generally are not happy to spend much more than an hour per day on commuting. There are no reasons to suggest that London introduces relative benefits that would significantly buck this trend. This limits the physical extent of London's commuter belt. While some jobs will drift towards being more easily conducted from home, a sizeable proportion of jobs (particularly those conducted by younger people) will remain located in central London.

There is a risk that, as demand is displaced to commuter belt towns well linked to central London, the benefits of lower costs and greater space will be reduced. This reduces further opportunities for younger and immigrant groups to find suitable housing, risking these groups looking elsewhere to take their labour, energy and ideas. As such, a focus of transportation infrastructural improvements should be on improving access to central London from outer London locations.

Beyond potential impact on labour, the subsequent displacement of lower income groups from central areas risks the reduction in cultural diversity, a strength of London as a global city, and potentially meaning London becomes a less interesting place to live. These combined factors ultimately risk London becoming a less attractive place to live and work, losing competitiveness both nationally and globally.

[Response 3]

From a classic transportation economics perspective, demand for commuting is derived rather than innate. In the case of London, the concentration of well-paid jobs in central London vis-à-vis the lack of affordable housing inaugurates the demand for excess commuting to access job opportunities. Charging a council tax supplement will not only capture the land value lifted by publicly invested transport infrastructure in London, but will also discourage the non-commuting investors from holding housing stock only as an income-generating asset, hence resolving the fundamental jobs-housing imbalance problem in London.

3.2. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

[Response 1]

Investment in transportation infrastructure should focus on enhancing public transportation services. While London has formed and expanded on road, transport provision over longer distances and of increasing numbers of people cannot be achieved through road expansion. Bold political leadership is required to make it clear that this must be the priority for investment, to ensure London's sustainable growth and continued success.

There are three main areas of opportunity for expenditure in transport infrastructure. First, involves significantly enhancing existing routes into central London from outer London and commuter belt locations, increasing speeds, improving capacity and expanding where necessary. Second, new infrastructure should improve the connectivity to and between outer London town centres, helping to promote their role as drivers of employment and productivity, reducing dependence on central London. And third, there should be a better integration of services, achieved through both infrastructural and organisational changes.

London is well served by a comprehensive distribution of public transportation services. However, these routes often lack sufficient speed, frequency and reliability of service. A priority should be placed on expanding these existing public transport services to growth areas in outer London and the commuter belt. Increased provision to these regions will ensure improved housing options for those wishing to work in London, increasing access to central London, and ensure adequate labour provision for central London employers. Specific extensions to existing infrastructure that should be considered are:

- Improve speed and frequency of regional rail and Overground services in south east London, taking these services closer to Underground level services. Make better use of hubs for interconnection between services where infrastructure currently intersect (e.g. at Peckham Rye, Crystal Palace or Tulse Hill).
- Improve Overground services to north East London, improving the link with the Victoria Line at Walthamstow.
- Improve capacity and frequency of rail services along north London lines to Welwyn Garden City, Hatfield and Potters Bar.
- Make better use of HS1 services to St Pancras via Stratford with increase in high speed services from Gravesend, Chatham, Maidstone and Ashford.
- Improve speed and capacity of services to Essex (Basildon, Brentwood, Southend).
- Extension of Victoria line from Brixton to Croydon via Streatham and Norbury.
- Extension of Bakerloo line to South East from Elephant and Castle (already under consideration).
- Ensure improved speeds and frequency along the Hertford East line to Broxbourne, Hertford and Ware (some provision is stated in Crossrail 2 proposals).

As a secondary priority, the provision of new services between outer London locations should also be considered. Increasing land prices in central London will increase the importance of outer London town centres as drivers of employment. Given increasing demand through central London, direct connections between centres should be considered. Overground services are currently not quick enough to provide the required connectivity. Priority should be given to north-south links in east and west London (e.g. Stratford to Lewisham and/or Bromley; Wembley to Kingston). The currently piloted Mini Holland scheme to provide direct and safe cycle routes into major town centres from surrounding areas should be expanded.

The public transport network requires greater equity in terms of service speed and reliability, and this will be best achieved through centralisation transport planning and operations. Many of the rail services are woefully underserved, poorly managed and overpriced (Thameslink is one particular service). London's development should not be put in the hands of Train Operating Companies with little motivation to adapt quickly to changing conditions. Transport for London should be granted control over all services, allowing the development of an integrated and current

transport plan. An extension of planning and operations should be considered as far as rail services from some key commuter belt towns, again in order to better plan and coordinate future development.

[Response 2]

There are several opportunities to increase the benefits and reduce the costs of CrossRail 2. First, multiple-platforms should be considered in all the stations at the core section. In busy metros, the number of trains per peak hour is decided by the dwell time of each train at each station. The dwell time is the time used for passengers getting on/off a train (and for some at-station operations, including safety check before door closure). The current standard platform configuration for Crossrail 1 and other metro lines is shown in Figure 1. With this configuration, if a train stops at a station, then next train cannot enter the platform. Although London Underground's Victoria line runs 34 trains per hour, this is exceptional and is possible because each carriage has 4 doors on one side and the destination of trains are the same (and thus little variance in terms of the number of boarding passengers). Because Crossrail 2 will have several branches and the passenger distribution between trains will not be even (and the number of doors per carriage per side would be two or three), with the standard station configuration, it could run only up to around 24 trains only. UCL has run a series of experiments to investigate whether or not it is possible to accommodate 50 boarding/alighting passengers when the proposed Thameslink runs 30 trains per hour (proposed maximum capacity), and the result was "No" (UCL, 2008).

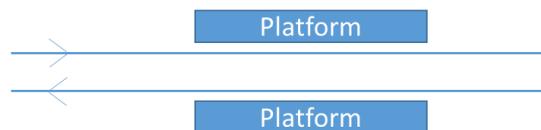


Figure 1. Standard track/platform configuration at stations

To solve the problem, an answer would be multiple platform (Figure 2). With this configuration, while a train is still dwelling at Platform 1, the next train in the same direction can enter Platform 2. This would allow more trains to run on the same line and it is possible to run around up to around 34 trains per hour even if the dwell time is significantly longer than that of Victoria Line. It can be seen that the additional infrastructure is just an additional track on the outer side of the platform in each direction and this little difference in fact significantly improves operational capability. In addition, even when a passenger ill is taken from a train (which is one of the major reasons of train delay of London Underground), if there are two platforms, one platform is available for the next train, which can run without being delayed by the train with the passenger ill. This improves the resilience of the operation. By adding switches between platforms 2 and 3, trains can reverse in case of emergency and this also improves operational resilience. Some people may think this is an engineering issue, but it is important to take account of this at an early planning stage because Crossrail 1 or Thameslink did not consider this, and it is envisaged that they will suffer from long dwell time of trains in its core section, in particular St Pancras and Tottenham Court Road stations.

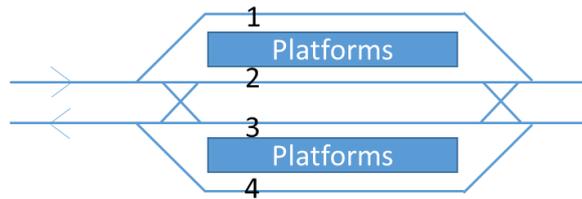


Figure 2. Suggested track/platform configuration at stations

Secondly, it is possible to consolidate depots around London. Currently, South Western Main Line has a depot at Clapham Junction and Wimbledon, and Great Anglia and West Anglia Line has one at Illford as a near-London rolling stock base. The reason of having a London depot is that London is a terminus of the line and operationally it is convenient to have a depot around a terminus. However, when Crossrail 2 opens and many trains run through London, there will be no strategic reason to have a depot in or near London where land prices are high. Depots can be consolidated and moved somewhere (and old depots in and around London can be sold).

[Response 3]

Crossrail 1 has been partly funded by business rate supplement. Yet, residential landlords are arguably the bigger beneficiaries of improved transport infrastructure in London. A similar council tax supplement will not only capture the residential land value lifted by Crossrail, but will also incentivize more efficient location choice by all of the Londoners.

3-3. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

[Response 1]

In the UK, although a good portion of the rail fare revenue will be reinvested to infrastructure improvement, customers do not feel that their money will be used for improvement of their lines. In Japan, there is a law which enables each private train company to add a (relatively small amount of) surcharge to the fare, which will be used solely for a specific capacity improvement project. This arrangement looks similar to the current funding arrangement for Network Rail and Train Operating Companies in the first sight, but the differences are that 1) in Japan each main commuter line is owned by a different company and thus customers think that the surcharge is used only for the improvement of their particular line, and that 2) the surcharge can be added even before the project completes on the basis that current users will benefit in the future. This approach can be used in the UK as well. For example, as preparation for Crossrail 2, it may be possible to add a specific surcharge to the lines whose trains will run into Crossrail 2. The surcharge can be distinguishable from what the TOC would like to charge as the fare to them. Because people can expect that the money will be used for the specific project which is (or will be) beneficial to them, it would be easy for them to accept the surcharge.

In addition, before Games 2012, there was an increase of council tax in London to generate funding for Games-related constructions. This was accepted by the public because the increase of

the tax was for a limited period and Games 2012 were generally welcomed. This approach can be used for major transport projects which bring a wider economic benefit to communities.

Lastly, when contracting out the work, Crossrail 2 should consider consolidation of the infrastructure building and railway operation (i.e. running trains). Past major transport projects in London have seen separation of infrastructure building and railway operation, which is common in transport infrastructure development in developing countries. London Underground's Public Private Partnership scheme, which included infrastructure upgrade and operation, did not go well, but this was mainly down to their lack of experience in specification or contracts. Now London has learnt lessons, and the proposed combined approach could save money because in modern projects, much money and effort have to be spent on integration between different systems. By consolidation, it is possible to transfer the costs and risks associated with integration, to the contractor.

[Response 2]

Apart from the aforementioned value capture taxation approach, China has been experimenting with privately funded metro station maintenance by local homeowners who expect their property/land value to rise as a result of improved transport facilities.

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The Benefits of Transport Investment: and why we can't build our way out of congestion

Submission to the National Infrastructure Commission by Dr David Metz, Honorary Professor, Centre for Transport Studies, University College London, formerly Chief Scientist, Department for Transport.

In this submission I offer evidence of the ways in which transport investment benefits individuals and society, in particular how this contributes to economic growth. I compare and contrast the rather different situations of London and the Northern cities.

Long term trends in travel behaviour

The Department for Transport (DfT) commissioned the first National Travel Survey fifty years ago and has repeated this regularly for forty years. Figure 1 shows the key parameters on a per capita basis covering all modes of travel (except international air). Average journey frequency has remained at about 1000 trips per person per year over the period. Average travel time has held steady at around 370 hours a year or an hour a day, a figure found globally for settled populations. What has changed is the average distance travelled, which increased from 4500 miles a year in the early 1970s to 7000 miles by the mid-1990s, since when there has been no further growth.

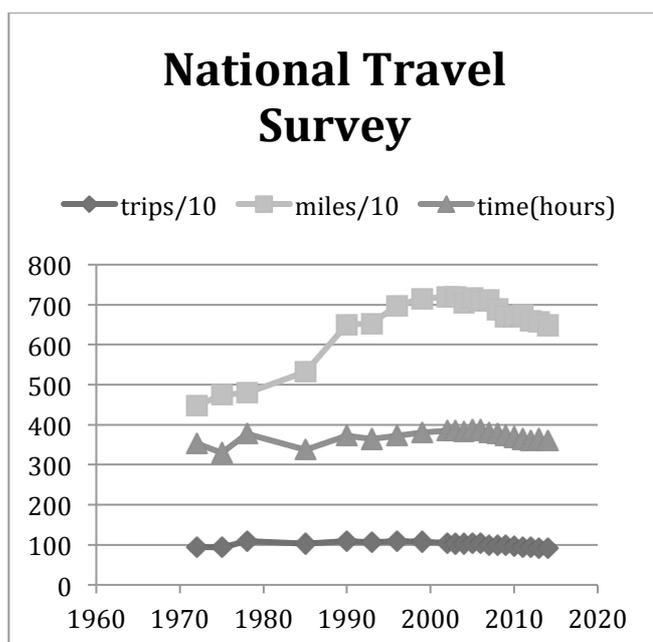


Figure 1 Source NTS(2015)

People have travelled further in the same amount of time because they have travelled faster, the consequence of investment in speedier forms of transport – private investment in cars, public investment in road and rail infrastructure and trains. It is important to recognise that people have taken advantage of higher speeds to reach more distant destinations, not to save time travelling to unchanged destinations. We travel further in order to have more access, opportunities and choices. For instance, by travelling faster on the journey to work, we have more choice of employment accessible from where we live in the time we allow ourselves for commuting, more choice of homes accessible from our workplace, and similarly more choice of shops, schools etc.

Figure 1 shows that there has been no growth in per capita travel for the past twenty years. Growing personal incomes are no longer an important factor in the growth of travel. Rather, population growth is now the main driver of overall demand growth.

Three-quarters of the average distance travelled in Britain is by car, hence we find that the average distance travelled by car has also ceased to grow, starting well before the recent recession. This cessation of growth of per capita car use is found for most of the developed economies for which data is available, a phenomenon known as ‘peak car’. A number of contributing factors have been identified, including less interest in cars by the urban young, changes in company car taxation (in the UK), saturation of demand for access to daily travel destinations, and technological constraints on faster travel (Metz, 2013).

Economic benefits of transport investment

The convention of transport economists, central to the DfT’s investment appraisal methodology, is that the main economic benefit of transport investment can be estimated as time saved through faster travel. Such time savings are valued because they permit more productive work or desired leisure. However, the evidence of the National Travel Survey is that there are no time savings in the long run, as seen in Figure 1, which is in effect an evaluation of the impact of cumulative investment over a forty year period. Time savings are therefore short run and mislead as regards the benefits of investment in long lived infrastructure.

People take advantage of higher speeds to travel farther, which results in changes in land use, development in particular. This is evident in the regeneration of East London, Docklands and beyond, the consequence of public investment in urban rail that has made brownfield land accessible for development by private sector developers who construct commercial and residential properties that accommodate jobs and homes for the city’s growing economy and population. The causal mechanism linking transport investment to economic benefit is via improved access and resulting development.

Notional time savings by those who, for instance, will travel from home to Canary Wharf using Crossrail when opened do not illuminate the case for this investment since these depend on both uncertain forecasts of passenger

numbers and problematic Stated Preference experiments intended to value individuals' trade-offs between time and money. Moreover, the 'wider impact' benefits that are conventionally added to the time savings are based on econometric estimation of agglomeration and related effects – further notional benefits, not directly observable.

Changes in land use and enhancement of land values are not included as benefits in conventional appraisal because this is seen as double counting benefits already included as time savings. However, this is a theory-based approach. An evidence-based approach would count what is real and observable, which would avoid double counting because people can do only one thing at a time – if they are taking the benefit of faster travel to gain more access, opportunities and choices, they cannot be saving time to carry out other activities, and vice-versa.

Investment appraisal of proposed transport investments should accordingly be based on evidence of expected benefits, as assessed from evaluations of outcomes of similar completed schemes. In general, changed land use and real estate development will constitute an important part of the benefits, which it would be misleading to disregard.

Road and rail investment

The case of investment to catalyse the development of Docklands is characteristic of new rail routes. Recall the USA in 1840, populated largely along the coasts and inland waterways, the economy about the size of that of Italy's. There followed a boom in railway construction that opened up the interior to agriculture, mining and industry such that by 1890 this was the largest economy on the world.

Rail investment can effect a step change in access. For roads, the effect is generally incremental. Consider England's Strategic Road Network (SRN) where much investment is planned to cope with forecast growth of traffic. Congestion largely occurs near to populated areas where local users take advantage of the network for daily travel, whereas remote from such areas the traffic generally flows freely. Thus about half the traffic on the M25 comprises long distance users, for instance between the south coast ports and the Midlands and the North, avoiding London, the purpose for which this orbital route was built. The other half is local traffic, in particular journeys to and from work giving rise to the familiar morning and evening peak congestion.

The conventional approach to investment appraisal sees a congested motorway as an opportunity for investment to increase capacity. Time savings per vehicle multiplied by the large number of vehicles, then multiplied by standard values of time savings, generate monetary values of economic benefits that are compared with the construction costs to allow judgment about value for money. However, the time savings per vehicle are quite small.

Evaluation by the Highways Agency of a large number of what it terms 'major schemes' indicates average time savings of 3 minutes at peak, less away from the

peak usage. There is debate about the significance of such small times savings. On the one hand, it is argued that these are too small to change behaviour and so should be disregarded. On the other, it is contended that small time savings add up and so in logic must be counted.

While 3 minutes saving on a long distance trip is immaterial in behavioural terms, such time saving is likely to be significant for a local user. The faster travel made possible by an extra lane or improved junction, for instance, allows more opportunities and choices, particularly when people come to change jobs or move house. More generally, in those parts of the country where demand for housing exceeds supply, it must be expected that local users will take advantage of additional capacity on the SRN to seek more distant housing opportunities that they can afford. A similar effect is seen with urban rail improvements such as London's Overground. Some of the largest percentage increases in house prices in London in recent years have been found near stations on this route south of Docklands, in locations like New Cross, of limited inherent attraction but with relatively low priced housing.

When analysing the case for road investment, it is important to consider the different kinds of user and how each may benefit (as is done for rail investment, where commuters are distinguished from long distance travellers). Available evidence is consistent with the proposition that the main benefits of investment in the SRN accrue to local users who are enabled to travel further on their daily trips. The extra traffic thereby generated is known as 'induced traffic', which is the consequence of road construction and arises because in the long run people take the benefit of faster travel by travelling further, not by saving time. This extra traffic restores congestion to what it was before the investment and is the basis for the maxim 'You can't build your way out of congestion', which we know from experience to be generally true.

The increased access made available to local users leads to changes in land use - property development where planning consent is granted, increased prices of existing property where not. Such development is largely unintended. There is, however, a case for intentional road construction to foster development, but this has to be led by the developers and planners. If they agree that a site is suitable and commercially attractive for development, whether residential or commercial, and if investment in road access is needed to permit the development, that could be an appropriate claim on a roads budget, whether local or national, subject to a value for money test.

An example is the plan for a new 'garden city' on a former military site near Bicester, where 13,000 new homes are to be built and where the DfT has allocated £44m for road construction, including a link to the M40. This illustrates both that new housing on greenfield sites will require road investment on account of car ownership by residents, and that decisions about the location of such investment must be based on the intentions of the planners and developers, bottom up, not as part of a top down national strategy.

Tackling congestion

The rationale for much roads investment is to relieve congestion. One stated aim of the Government's Road Investment Strategy is a 'free-flow core network, with mile a minute speeds increasingly typical'. But if we can't build our way out of congestion through investment in civil engineering technologies, how is this aim to be achieved?

One possibility would be to toll new road capacity, partly to finance the construction and partly to deter local users who impede long distance traffic. The M6 Toll road operates successfully in this way.

A second approach addresses the reason why congestion is a problem. Surveys of road users indicate that an important factor is lack of reliability - the uncertainty of journey time. This can be tackled by providing users with good predictive trip time information. An example is the motorway roadside variable message sign predicting the time to the next junction – albeit short range and hence of limited utility. A more ambitious service is provided for freeway users in the Seattle area of the US who can input to the Department of Transportation website the locations of their home and work, the time they wish to arrive at work, and are advised the time to leave home to be at work on time 19 times out of 20. A further example is Google Now, which includes predictive travel times on the road system.

As well as providing useful information to individuals that lessen unreliability associated with congestion, there are benefits to the network as a whole. There are two kinds of road user: those who need to be at their destination at a particular time (for instance, going to work, to a meeting, making time-critical deliveries), who can use predictive journey time information to decide when to set out; and those who are more flexible in trip timing (going shopping, making am/pm deliveries), who can use such information to avoid peak traffic. This is win-win since the more the flexible users can avoid peak times, the less the congestion experienced by those who cannot avoid them.

The scope for mitigating the uncertainty associated with congestion is indicated by the ability of efficient road freight hauliers to offer clients just-in-time delivery. A haulier may contract with a supermarket chain to deliver from the central warehouse to the stores within 30-minute time slots, which the haulier can achieve because of the good understanding of the network and the ability to manage the location and performance each vehicle in the fleet using real-time and predictive traffic data from commercial sources.

Transport and economic performance

This road freight example is one instance of the way in which investment, in digital technology in this case, can contribute to improving business performance. It should be seen in the broader context of retail distribution taking advantage of faster travel on the road network to optimise efficiency by

consolidating many regional depots into a few large central facilities, thereby saving estate and inventory costs while improving distribution to high street outlets, so enhancing competitiveness.

It is, however, difficult to generalise about how transport investment may be expected to improve economic performance where the road and rail networks are mature, so that investment is at the margin, rather than transformative. The What Works Centre for Local Economic Growth at the London School of Economics has reviewed 29 impact evaluations that met minimum standards of evidence (WWC, 2015). Key findings, mostly based on a small number of studies, include:

- Road projects can positively impact local employment. But effects are not always positive and a majority of evaluations show no (or mixed) effects on employment
- Road projects may increase firm entry (either through new firms starting up, or existing firms relocating). However, this does not necessarily increase the overall number of businesses (since new arrivals may displace existing firms).
- Both road and rail projects tend to have a positive effect on property prices, although effects depend on distance to the project (and the effects can also vary over time)

The general lessons from this review of transport investments are:

- The economic benefits of transport infrastructure spending – particularly as a mechanism for generating local economic growth – are not as clear-cut as they might seem on face value.
- Arguments for spending more in areas that are less economically successful hinge on the hope that new transport is a cost-effective way to stimulate new economic activity. We do not yet have clear and definitive evidence to support that claim.
- Our findings raise fundamental questions about scheme appraisal and prioritisation, and about the role of impact evaluation in improving decision-making around transport investment.

Transport investment in London

The population of London is growing quite rapidly, but the city long ago decided not to accommodate additional car use, so the share of journeys by car has fallen from a peak of 50% of all trips in 1990 to 37% currently, with further decline to about 27% expected by 2050 on the basis of forecast population growth (central case) and continuing policies to invest in rail but not increase road capacity. Figure 2 shows an estimate of the share of journeys by car in London over the century 1950-2050. This exemplifies the concept ‘Peak Car in the Big City’.

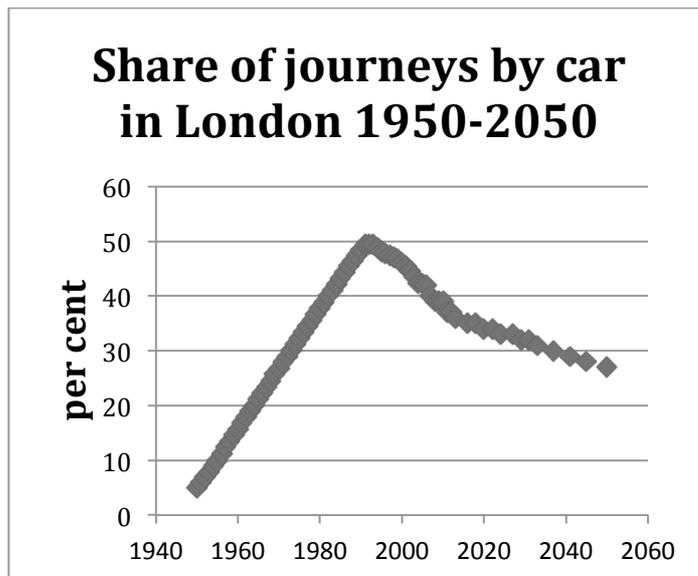


Figure 2 Source Metz (2015)

London is thriving - economically, culturally and socially – both despite and because of the decline in car use. Two key policies are largely responsible: a road capacity constraint plus parking controls in the inner boroughs and congestion charging in the centre; and major investment in rail that provides speedy and reliable travel for work trips, compared with the car on congested roads. As we see at Canary Wharf, well paid professionals can be attracted out of their cars onto trains through the stick of limited parking and the carrot of frequent fast rail services. In contrast, cities that rely on buses for public transport find it much more difficult to get commuters out of their cars.

The Mayor of London is responsible for both the transport system and for spatial planning, a helpful combination which contributes to the success of the city. The London Infrastructure Plan 2050 outlined options for investment in transport and other infrastructure to respond to population growth from 8.6m currently to 11.3m central estimate by mid-century and the corresponding growth in employment. This spatial plan provides a suitable strategic context for specific schemes such as Crossrail 2.

The economic case for each individual scheme will need to be made. This case needs to be grounded on evidence-based expectations of the benefits, in particular development of real estate (land and property) that will accommodate jobs and homes. Benefits from travel time savings should be counted only when these can be observed. Notional benefits from ‘wider impacts’ would be subsumed within market values of property and rents.

Given that the long term benefits from transport investment are found as real estate development, Transport for London should work closely with developers and planners to secure the benefits from its investment. In favourable cases, the enhancement of land values may be sufficient allow the developers to contribute to the cost of the transport investment.

Transport investment in Northern cities

The example of London argues for a spatial plan to provide the context and rationale for transport investment in the Northern cities to accommodate population and economic growth. One possible outcome, perhaps tacitly, would recognise Manchester as the main centre of the region, with an emphasis on the development of that city as a centre for business services. Another, perhaps politically more feasible, would be a multi-centric region of medium sized cities, somewhat analogous to the Thames Valley, with a mix of manufacturing and services. One key question is how to take advantage of the research potential of the universities, both for the cities in which they are located, and across the region. Related to this is the question of where to locate business in relation to the availability of skilled staff (it is noteworthy that Amazon has recently moved its UK HQ from Slough to central London).

At present there is no mechanism for spatial planning across the Northern cities as a group, and hence no consideration of options for location of population and economic growth across the region. Absent a spatial plan, decisions on transport investments will be an important influence on spatial development in ways that need to be addressed as part of the investment case.

It is not straightforward to develop a persuasive case for specific investments in the context of the Northern cities. Estimates of benefits based on travel time savings give no indication of the spatial location or likely scale of development. Estimates of 'wider impacts' depend on either rules of thumb or ambitious modelling which cannot be validated. It is therefore hard to say how transport investments will benefit the economies of these cities, based on conventional appraisal methods.

It is easier to predict changes in land use arising from transport investments that change travel to work patterns. Faster travel may be expected to result in people seeking housing and employment opportunities further afield. This would both improve the efficiency of labour markets and create opportunities for housing developments. For rail investments in particular, the location of new housing should be planned as part of the investment case.

Urban rail investments can allow cities to grow to higher density while meeting the mobility needs of the population. Regional rail plays a similar role. The tram-train being piloted at Sheffield-Rotherham is a relevant innovation. Bus rapid transit likewise provides speedy, reliable travel but at a cost lower than light rail (trams). Higher urban population densities generate agglomeration benefits, not only economic but also cultural and social, which enhance the attractiveness of cities, provided other aspects of urban liveability receive adequate attention. Accordingly, both urban and regional rail investments justify positive consideration.

What is unclear, however, is the extent to which better regional rail links that improve connectivity *between* cities would generate economic benefits over and above those associated with housing and labour markets for individual cities.

Road investments are even more problematic. For instance, the scheme to enlarge the M62 to four lanes along its entire length is intended to support the Northern economy but would induce local commuter use that would limit the benefits to long distance users. A new road link, largely in a tunnel, between Manchester and Sheffield might be of less benefit to commuters but would be expensive and hard to justify for improved connections between two cities that are otherwise well connected. More generally, road investments intended to improve connectivity within the region, whether north-south or east-west, are likely to be nullified by the stimulation of local use. Altogether, the ambitious plans for road construction set out in the Northern Transport Strategy seem of very uncertain benefit, albeit more consistent with a multi-centric region in which manufacturing remains important.

On the other hand, the plans for integrated information and ticketing across all public transport modes, part of this Strategy, are clearly sensible and, as digital applications, may be expected to be far more cost-effective than investment in civil engineering technologies. More generally, opportunities should be sought for other digital technology investments to improve the operations of the transport system and to enhance the experience of users. Predictive journey time information on the road network is one important possibility.

Modelling and forecasting

The standard approach to justifying transport investment of any scale involves modelling that compares a 'do something' case (ie with the investment) with a 'do minimum' case (without the investment). Most models estimate travel behaviour changes in the absence of land use change, generating travel time savings resulting from the investment that are used as inputs to the economic appraisal. However, for reasons previously discussed, assuming no changed land use is not consistent with evidence from completed schemes. Models that integrate transport and land use are available, although not generally employed.

Modelling involves much uncertainty, many simplifying assumptions and limited data for calibration. Transport models cannot be independently validated. Given the considerable judgement involved in generating plausible outputs, it is not surprising that modelling is generally found to support the inclinations of the authorities that commission the studies. When such authorities are bidding for central government funds, other people's money, modelling will generally be found to support the bid.

A further difficulty with transport models is the routine assumption that the future will be like the past, with change driven only by exogenous parameters such as GDP growth, population growth, oil prices etc. But if the future is different from the past, as is indicated by the peak of car use in London (shown in Figure 2) and similar indications for Birmingham and Manchester (Metz, 2013), then forward looking relationships (elasticities) need to replace historic calibration data. This is difficult to achieve in practice. For example, the DfT's

National Transport Model has not yet recognised the emergence of peak car use in London and so forecasts substantial increases in car traffic in this city.

Conclusions

The transport system moves people and goods through space. New investment adds to this movement, the benefits being reflected substantially in changed spatial distribution, not reductions in travel time. The difficulties that the Commission is likely to experience in making recommendations for transport investment derive in part from shortcomings in existing methodologies, in particular that conventional economic appraisal is based on estimates of notional times savings and disregards the evidence for changed land use and real estate development as important benefits of investment. Moreover, conventional travel demand modelling and forecasting does not recognise important recent changes in behaviour, as reflected in the peak car phenomenon.

For its medium term work, the Commission might wish to review these methodological issues. More generally, there may be a role for the Commission to act in ways analogous to the Office for Budget Responsibility and the Committee on Climate Change, offering advice to national and local government on the merits of infrastructure investment based on independent analysis, both of methodologies and of substance.

In London, expected economic and population growth is the main determinant of future transport investment, which is therefore relatively unproblematic in principle. For the Northern cities, such growth is less obviously a given, and a desired role for transport investment is to foster growth. However, the prospects for speculative transport investments are uncertain. Hence to secure the benefits of transport investments, decisions should not be taken in isolation but as part of planned real estate developments involving both developers and planning authorities. Decisions on urban and regional rail investments seem more straightforward than for road investments, for which there is a good case for preferring cost-effective digital to costly civil engineering technologies.

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4 January 2016

LONDON'S TRANSPORT INFRASTRUCTURE: Minding the Gaps

This evidence is submitted by Dr Nicholas Falk, founder director of URBED and an economist and strategic planner. Nicholas is a member of the Town and Country Planning Association's Policy Council and working group on London and the South East, and is the author of many publications on cities, including policy reports for the Greater London Authority on suburbs, some of which are referenced here, and which can be accessed freely on www.urbed.coop. He won the 2014 Wolfson Economics Essay Prize (with David Rudlin) for Uxchester Garden City, which shows how to build strategic housing that would be visionary, popular and viable.

The National Infrastructure Commission has a key role to play in ensuring a limited investment budget is spent where it will produce the best returns for the country. As London strives to compete with other world cities for investment, transport capacity will continue to be a top priority. However, having enjoyed a greater share of national investment since the Jubilee Line was extended out to Canary Wharf and High Speed One was opened up, and with the benefits of Crossrail One still to come, it will be very hard to make the case for more major projects on transport grounds alone.

Hence it vital to avoid 'vanity projects' and to consider not only 'agglomeration economies' but also the environmental and social benefits that would come from better planned growth at the edges. This brief paper suggests how 'smarter growth' could be secured, drawing lessons from Paris, Rotterdam and Copenhagen so that transport investment mobilises private investment in sustainable forms of development, especially new housing. It argues that the NIC should apply Multi-Criteria Analysis (MCA) to assess the impact of options on property investment and affordable housing.¹ In a sentence, and in the words of the familiar cry on London's Underground, the NIC should '*Mind the gaps.*'

1. Economic and social challenges

While London has reversed the economic decline of the 60s and 70s its economic position is precarious for three main reasons. First it is an exceptionally expensive city to live in, with high housing and travel costs.

¹ Recommendations on the use of MCA are set out in the final report of UCL's Omega 3 project 2010-
<http://www.omegacentre.bartlett.ucl.ac.uk/wp-content/uploads/2014/10/OMEGA-3-Final-Report.pdf> and in the RAMP handbook (Risk Analysis and Management for Projects, ICE 2014

Second the difficulties of finding somewhere to live and work could provoke more of the riots that damaged centres like Ealing and Clapham Junction a couple of years ago, and that have hit Paris. Third with English being spoken throughout Europe, the jobs in economic success stories like media and education could easily relocate to cities such as Paris, Rotterdam or Berlin, where not only are premises much cheaper, but it also easier and often more pleasant to get around. The problems are most acute in Outer London, as revealed in government wellbeing surveys, as well as in research URBED undertook for the Greater London Authority.²

In making national infrastructure investment decisions there are many choices and factors to be considered. For example The Guardian, in its lead editorial of December 8th at the height of the flooding stated:

‘Surely this is the time for the builders to build the infrastructure that people want and need. It’s time for government to put its money where its mouth is.. Flood defences are much greater priorities for those affected by these recurrent floods that HS2 or a third runway at Heathrow. Every pound spent on keeping communities dry and protected saves £10 in damage’.

Simon Jenkins’ s headline *London must stop sucking cash from the rest of Britain* says it all.³ The priorities for transport investment in London MUST therefore be linked to wider objectives such as opening up more affordable housing while retaining the stock of business premises around major stations such as Waterloo, London Bridge and Euston, and not just enabling long distance travellers to go further faster.

Annual study tours URBED ran for the TEN Group of London planners to European cities have brought out the potential for comprehensive planned mixed use developments with transport at their heart.⁴ Comparative data reveal that mid-sized European cities enjoy much shorter (and cheaper) commuting times to work, thanks to their metro rail systems.⁵ They also provide much better and safer conditions for cyclists and pedestrians, as the example of Copenhagen vividly illustrates. As a result these cities have benefitted from ‘smarter growth’ in which transport investment and development go hand in

² See for example A City of Villages: promoting a sustainable future for London’s suburbs, SDS Technical Report 11, Greater London Authority August 2002

³ Simon Jenkins Guardian Opinion, December 24th 2015

⁴ See for example Learning from Berlin, www.urbed.coop 2008 or Living Suburbs: London vs Paris, 2013 www.urbed.coop

⁵ Ed. Nicola Schuller et al, Urban Reports, gte Verlag, Zurich

hand, and reinforce each other, a point Professor Sir Peter Hall has highlighted.⁶ While taxes are a little higher, this is because citizens invest in their ‘common wealth’, rather than borrowing to fund consumption, which helps keep their national economies in balance.

2. Strategic options

Given the state of public finance, the big projects for the next couple of decades in London are likely to be the sort of project recommended in the Eddington report that tackle ‘*growing and congested urban areas*’.⁷ A general principle should be to protect and expand places that already have physical infrastructure and social and environmental capital, rather than making it easier for people to travel from ever further away into Central London.

Rather than more ‘grand projects’ we need many more small projects that are linked to great ideas. This is exemplified by the way an extension of the Northern Line south of the river is opening up privately funded development at the old Nine Elms market and Battersea power station, and by the impetus that Crossrail is giving to developments in run-down areas such as Woolwich. However such sites close to the centre of London, such as Kings Cross Goods Yard, are now very rare.

It is also going to be increasingly important to avoid ‘planning blight’, and focus investment where it will produce the best return. Living close to Euston and Kings Cross, it is clear that the much-trumpeted ‘regeneration benefits’ of starting High Speed 2 or bringing Crossrail 2 to Euston are largely illusory, as there is so little undeveloped space. Apart from the redevelopment of the offices at the front of the station, the benefits could only be achieved by demolishing perfectly good social housing in Somers Town and somehow relocating the tenants to some other part of London. The result would probably be another riot, and will be strongly resisted.

So instead it would be far better to look for places where there is under-used space for development, and where connectivity could be improved. As examples these include the inner stretches of the Great Western Railway and Paddington Arm of the Grand Union Canal, or the edges of growing towns on

⁶ Peter Hall with Nicholas Falk, *Good Cities Better Lives: how Europe discovered the lost art of urbanism*, Routledge 2014

⁷ The Eddington Transport Study: the case for action, HM Treasury 2006

the edge of London, such as at Chelmsford, Watford, Slough and Redhill that already serve as junctions, or at Brentford, where there is a freight only line running to Southall, and where quality development is at last underway.

If ‘grand projects’ are needed, a really great opportunity is the potential for redeveloping Northolt Airport as a new garden city taking advantage of the three underground stations that serve it, rather than reserving it for relatively few Royal flights. Similarly there are good arguments for pressing on with extending Old Oak Common to create a commercial centre on a scale that matches an area like La Defence or Stratford, as well as a major transport interchange between Crossrail and other railway lines.

3. Getting more value from Crossrail

If we applied sound economic principles such as the minimisation of waste and environmental impact, and the promotion of social justice to locations that could benefit from new transport infrastructure, what would we do differently? The first place to invest is where capacity constraints are being relieved, for example by connecting up Crossrail One with the Great Western so that people can interchange readily without coming to a London terminal. The same principle could be applied to High Speed Two, thus saving a large part of the investment budget and a construction programme that could block the vital Euston Road East West link for as much as seven years.

Indeed wherever property demand is high and space is under-occupied, there are strong economic arguments for ‘smarter growth’ to get much more value from any public investment. Transport turns out to be a necessary but not a sufficient condition for growth, as the long delays in developing Ebbsfleet or the Greenwich Peninsula demonstrate. Of course talk of new transport encourages speculative investment in buying land, but it does not build anything substantial that will stand the test of time.

So to get more benefits it is essential to follow European practice in dealing with land that is identified for growth so that the subsequent uplift in land values can be ploughed back into the project, as in Germany, for example.⁸ This depends on taking a more European or proactive approach to spatial planning, which in short might be called ‘Minding the gaps’. In other words we should be focussing on using transport to open up sites that are ‘ripe for development’,

⁸ Barry Munday and Nicholas Falk, *The ABC of Housing Growth and Infrastructure*, The Housing Forum, 2014

and to reduce congestion and overcrowding on local links. This can include copying the German approach of SBahn or fast local trains, which is now being promoted under the name Swift Rail.⁹

Because there are lots of branches on Great Western (due to Brunel's ambition of getting to Bristol as swiftly as possible), there is great potential for attracting people away from their cars for journeys to work in the parts of Outer London that are particularly prone to congestion. This should be combined with the greater use of bikes as in Copenhagen or Dutch cities, which would enable people to get to work in less time and with much less stress. Of course it means providing more bike parking (as in Cambridge Station, for example), as well as safe bikeways alongside direct roads.

4. Funding transport infrastructure

As well learning from Europe on how to secure 'integrated' transport where different modes support each other and offer the preferred alternative for many people to the private car, we can also relearn from European cities how to pay for improvement by linking transport with development. Once the benefits are tapped, as they were when the Metropolitan Line was built from Baker Street out to North West London, or as has partly happened with the development of the Railway Lands at Kings Cross, we no longer have to rely on an over-subscribed transport budget, which can be directed instead at regeneration areas where demand is weaker. While land value uplift will only fund a proportion of the cost, it can 'lever' up public investment, as for example happened in extending the Jubilee Line out to Canary Wharf.

The NIC could therefore innovate in how funding is raised for local infrastructure. Whereas the use of bonds to finance infrastructure is quite common in US cities such as New York and Portland Oregon, it has proved difficult to persuade the Treasury to give local authorities the freedom needed. As a result we end up with a perpetual 'stop go' situation, which increases costs and drains capacity. The latest escalation of costs on the Great Western electrification seem to show the failures of our procurement methods to deliver the forecast outcomes.¹⁰

But the faults essentially stem from the way projects are designed, promoted and selected with little real evaluation of the options, as Ian Wray stresses in his

⁹ Nicholas Falk and Reg Harman, *Swift Rail and Growing Cities, Tramways and Urban Transit*, January 2016

¹⁰ See feature in *Modern Railways*, December 2015

new book *Great British Plans*.¹¹ Examination of recent examples such as High Speed One reveal the British often place excessive value on environmental features such as the Green Belt without regard to the financial implications or the cost of longer journeys to work. The Omega 3 report referred to earlier provides plenty of further evidence on how to improve the design and delivery of major infrastructure projects.

With public funding for investment being in such short supply, consideration will have to be given to tapping private sources, and to using the uplift in land values as a means of reducing borrowing costs. While this falls outside the NIC's remit, there is a host of evidence that makes the case for a charge on land.¹² Recent examples such as Dublin's LUAS tram system or Nottingham Tramlink, to show how support from employers and property interests can be secured.

5 Lessons from foreign metropolitan areas

As far as London specifically is concerned, much can be learned from major Transit Oriented Development schemes, such as 'Paris Rive Gauche' over the railway lines into Gare de l'Austerlitz, or Rotterdam's Kop von Zuid which is linked to the new Rotterdam Station by the Erasmus Bridge. Another good model is Copenhagen's new satellite town of Orebro, which has largely funded the first line of their new Metro by tapping the uplift in land values.¹³ The National Infrastructure Commission could hugely increase the value for money from infrastructure projects if it not only assessed the full range of options in terms of their wider impacts, but encouraged new funding and organisational models drawing on European best practice.

While direct comparisons are limited, the general conclusion is that

*For the UK, the main focus remains on the directly attributable economic performance of the transport service itself. In most continental European countries, the wider aspects of economic and strategic impact play an important part in considering the return on public funding; the political and technical processes of establishing this are key to decisions.*¹⁴

¹¹ Ian Wray, *Great British Plans*, Routledge 2015

¹² See for example TCPA publications like *Connecting England*, or *The Lie of the Land* in Hugh Ellis and Kate Henderson, *Rebuilding Britain*, Policy Press 2015

¹³ Each of these form case studies in reports of URBED's TEN Group study tours

¹⁴ Reg Harman, *High Speed Trains and the Development and Regeneration of Cities*, Greengauge 21, 2006

So what needs to be done? Sir David Higgins has set out five guiding principles for HS2, which provide a good start:

- Stand the test of time
- Be the right strategic answer
- Be integrated with existing and future transport services
- Maximise the value added to local and national economies, and
- Be a catalyst for change both nationally and locally.

But infrastructure (and HS2) is about far more than just transport, and so projects need to be evaluated against a multiple set of criteria. For example, the connection of Lille to the Channel Tunnel Rail Link to Paris provided the impetus for reversing the decline of a whole region. The case study in *Good Cities Better Lives* shows how local political leadership joined up transport and development.¹⁵ It contrasts with the sorry tale of North Kent, which is a case study in Ian Wray's *Great British Plans*.

Similarly development over the railway lines running into Gare de l'Austerlitz has transformed and reconnected a poor part of Paris with both sides of the River Seine. If such an approach were applied to Euston, it could overcome some of the objections, as at least it would provide additional land for regeneration. The summary of the French and German case studies in *Good Cities Better Lives* concluded that their greater success could be attributed to:

- 1 Municipal leadership
5. Strategic planning
6. Public-private relationships
7. Multi-Criteria Analysis
8. Local taxes on employers
9. Cost control
- 10.Domestic industry
- 11.Urbanism
- 12.City-regional cooperation.

The French approach is not perfect, and they have had much more civil disorder than London has yet experienced. Nevertheless, it does provide a relatively simple model for strategic planning that London could well learn from before it

¹⁵ Chapter 9 in Peter Hall with Nicholas Falk, *Good Cities Better Lives*, Routledge 2014

designs and delivers the next ‘grand project’.¹⁶ Significantly most European cities have adopted similar approaches to managing their own futures rather than depending on passing the begging bowl to government for every project. The National Infrastructure Commission could therefore fill an important gap by commissioning some comparisons in advance of further work on designing projects that may never be built.

6. Filling the gaps

Changing a flawed planning system will not be easy. In the introductory chapter to *Great British Plans* Ian Wray points out the 60% of the country’s infrastructure is now in private hands, the highest proportion in the world. This makes it very hard to secure the level and quality of infrastructure we need. Turning to the Chinese for help will still leave Britain with a long-term financial obligation. Plans often fail to deliver the promised outcomes because values have changed. So predicting what people will value in 30 years’ time is thought impossible, even though most innovations take this time to mature and spread. Yet as the Omega research at UCL has brought out, projects change, often for the better, as a result of debate about options. The techniques exist for making much better transport choices¹⁷. But the benefits can never be realised if projects are conceived and executed in silos, and then implemented for lack of better options. So the centralised nature of both the private and public sectors must be corrected if we are to do more with less, to plan for posterity rather than austerity.

So who would benefit from taking a longer-term and more holistic viewpoint, for example focussing on Britain in 2050, not just up till the next parliamentary election? The immediate answer is our children, and their children as well. So too would the poorer countries whose populations and economies are growing fastest. Less obvious are medium sized cities, such as Oxford, where there is a chance of securing more balanced growth and avoiding the diseconomies of over-crowding and pollution if funds were invested in good local transport systems.¹⁸ Also anyone who owned land on the edge of fast growing cities, especially those that benefitted from improved infrastructure and favourable planning decisions, would receive an unexpected gift from the State, and

¹⁶ Nicholas Falk, *Urban Policy and New Economic Powerhouses*, Town and Country Planning, August 2015

¹⁷ See for example, *Trams for Oxford: could light rail improve our historic cities*, report of a UCL/URBED seminar, March 2015 www.urbed.coop

¹⁸ Reg Harman and Nicholas Falk, *Developing Historic Cities: the case for an Oxford Metro, Tramways and Urban Transit* May 2015

therefore should be willing to accept paying a charge. We might even start rebuilding our lost capacity to engineer and supply transport products.

In short the key to making better infrastructure decisions, as the new National Infrastructure Commission may want to consider, would be to switch from valuing narrow costs and benefits to considering the longer-term impact on capital of all kinds – economic and social as well as physical and natural when it comes to both designing and assessing major infrastructure projects. While this may sound impossibly complex, given the failures of efforts to agree where, for example, London’s hub airport should develop, it could be applied to the next big issues on the public agenda such as Crossrail Two, High Speed Three or boosting energy capacity, all of which are on the National Infrastructure Commission’s agenda.

7. Conclusions

By using a form of Multi-Criteria Analysis, and analysing property values and trends, it would be possible to assess and value the impact of major infrastructure projects. The NIC could draw on examples from elsewhere to show the wider benefits. For example West London can draw lessons from the area around Charles de Gaulle airport or Schipol in Amsterdam. The Northern cities can usefully learn from the experience in the Dutch Randstad or the North Rhine area of upgrading local public transport. By setting the level of investment needed to match international competitors, and then allocating it where it will do most to close the gaps in living standards, we could reduce inequalities, and at least achieve the goal of social justice.

When the projects then raise productivity, as they should, and help minimise waste, for example by cutting the time taken to get to work or saving the need to build expensive bypasses, we will also score on the economic goals of minimising waste. Of course political judgements will still need to be made, but at least they can take some account of longer-term consequences rather than short-term electoral arithmetic. Going from ‘stop go’ to planned investment cycles is crucial to rebuilding Britain’s productive capacity, and avoiding the kinds of scandals that arise from costs overrunning due to lack of qualified engineers.

Finally, by changing behaviour so we use less energy and natural resources while improving wellbeing, for example through a great increase in cycling and walking or encouraging building new homes in the right locations, the NIC

would provide a model for sustainable development. That alone should be sufficient to overcome the opposition to acquiring land on the edge of growing cities at close to existing use values, and ploughing the uplift in land values back into improved local infrastructure. Of course there is nothing new in this. It is what Ebenezer Howard proposed for Garden Cities and the post-war New Towns started to do. All it needs is for our 'political leaders' to focus infrastructure investment on making the lives of future generations better, a cause that people from all sides should support.

Dr Nicholas Falk

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[email redacted]

December 2015

Rt Hon Sir Alan Haselhurst MP
Chair of the West Anglia Taskforce

National Infrastructure Commission
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London
SW1A 2HQ

By email to: londonevidence@infrastructure-commission.gsi.gov.uk

8 January 2016

RE: NATIONAL INFRASTRUCTURE COMMISSION CALL FOR EVIDENCE

Dear Andrew,

I write on behalf of the West Anglia Taskforce in response to the National Infrastructure Commission's invitation for evidence. The Taskforce is currently in the middle of an exercise compiling the evidence base for investing in the West Anglia Main Line (WAML) and will report its initial findings to the Government in the summer of this year. Members of the Taskforce include MPs, Council leaders and cabinet members, senior officers from the Department for Transport, Network Rail, and Transport for London and representatives of key businesses and business groups from along the route.

Investment in the WAML is necessary because the London Stansted Cambridge Corridor it serves has a unique value to the UK economy, and is growing fast:

- The corridor is one of the most successful economic regions in the UK, linking the university city of Cambridge with London, passing through identified growth areas such as the Upper Lee Valley (London's largest Opportunity Area) and the Harlow Enterprise Zone. The Centre for Economics and Business Research has projected that Cambridge will be the fastest growing city in the UK in 2016, growing at 2.9 per cent; London is expected to grow at 2.7 per cent.
- The corridor is a crucial arm of the London, Cambridge and Oxford 'golden triangle' which is driving technology and bioscience-led economic growth in the UK, and is home to major international operations from Microsoft Research, ARM Holdings, AstraZeneca, GSK, Pfizer and Illumina. Life Sciences and medical technology is the third largest contributor to economic growth in the UK and, according to research by the London Stansted Cambridge Consortium in 2015, is set to generate over 14,000 new jobs by 2023.
- The rail line is the primary gateway for domestic and international passengers using Stansted Airport, one of Europe's fastest-growing major airports, with onward connections to over 160 destinations in Europe, North Africa and North America. As pressure on airport capacity continues to grow in the south east, Stansted occupies a

unique position in the region as the only airport with spare runway capacity and room

to grow in the future.

- London and Cambridge are ranked first and fourth respectively in the 2014/15 FDI (Foreign Direct Investment) "Top European Cities of the Future", based on their favourability for inward investment. Cambridge already has over 320 foreign-owned enterprises, supporting nearly 20,000 jobs and contributing almost £5bn in turnover. Not investing here could mean that business goes abroad and the UK loses out.

However, transport and housing constraints in the corridor are already beginning to limit this growth:

- The number of jobs in the area has increased at more than double the national rate in the last ten years. This creates a clear concern about how increasing numbers of commuters to the growing businesses along the corridor will access their places of work.

- A shortage of skilled labour will hold back companies from investing in the corridor, and there is already evidence that the labour market is tight. There are now historically low unemployment rates in some areas; for example, the unemployment in the district of Uttlesford is only 0.7 per cent (and this will continue as Stansted Airport and other businesses locally expand). An employer survey by the South East LEP found that there are many vacancies across the area in technical roles requiring higher-level education and that 23.7% of vacancies were due to skills shortages. This is despite the fact that in many areas of the corridor, the percentage of the workforce holding degrees is significantly higher than the national average.

- The building of new homes in the area is not keeping pace with population growth forecasts. In the last five years, only 9,400 new homes have been delivered in the corridor per year, with ONS forecasts suggesting that 16,800 each year are needed.
- The WAML currently consists of just two tracks along its entire length. With fast and slow services competing for space, this results in longer journey times, a limit to the number of services that can run and a high risk of service disruption due to a lack of alternative routes if one track is out of action. This creates an uneasy contrast between the area's first class businesses and the second class railway on which their workers and visitors need to travel to access them. Journey times on the Stansted Express, for example, have increased in recent years with some trips now taking over 50 minutes; this is entirely wrong in terms of supporting a growing airport and wider airport capacity requirements in the South East.

Improving the railway line by providing extra tracks on the busiest parts offers an excellent opportunity to unlock thousands of new homes and jobs along the route, as well as enhancing international transport links:

- There are several ways of improving journey times, increasing resilience and providing new capacity on the railway, but the most effective way of achieving all three is by laying additional track. Providing two extra tracks on the busiest part of the line means that fast and slow services can be separated, allowing for quicker journeys, the ability to operate more trains and a reduced risk of delays.

- Four-tracking the railway from Broxbourne to Tottenham Hale, for example, would enable shorter journey times between Cambridge, Stansted and London, more frequent services where they are needed and improvements to the resilience and reliability of the route as a whole.
- As well as unlocking housing and employment potential by improving links between the hubs of London and Cambridge, this proposal would provide huge benefits to users and employees of Stansted Airport. Fast services to the airport are currently hampered by sharing track space with slower local services, and four-tracking would alleviate this pressure. The Airports Commission specifically recognised the need to make use of the potential available at Stansted Airport for the benefit of the whole of the south east, and four-tracking would represent a big step towards realising this aim.

Crossrail 2 is required to maximise the potential opportunities and underpin a successful corridor for decades to come

- Four-tracking alone will unlock significant growth potential along the WAML corridor, but these benefits would be hugely enhanced by Crossrail 2. While the existing WAML terminates at two London stations with limited opportunities for expansion – Stratford and Liverpool Street – Crossrail 2 would provide an outlet for many more trains to serve the line, enabling a step-change in service frequency. Crossrail 2 could allow up to 15 trains per hour to serve WAML stations on a new four-tracked section through the Lee Valley.

- Four-tracking followed by Crossrail could unlock up to 70,000 new homes and 25,000 new jobs in the WAML corridor alone. Tens of thousands of new homes could provide businesses from Cambridge to London with a substantial expansion of their labour market.

- The early delivery of four-tracking by 2024 will ensure that this growth can be kick-started ahead of Crossrail 2 opening in 2030.

Making the case for four-tracking and Crossrail 2

The West Anglia Taskforce has been set the challenge of making a compelling case for investment in this corridor and is working hard to gather the evidence needed to ensure a robust business case is submitted to the Government in summer 2016. Ahead of this, the Taskforce looks forward to supporting the work of the National Infrastructure Commission over the next few months as it analyses and examines potential schemes and provides its own evidence to Government.

Yours sincerely

Rt Hon Sir Alan Haselhurst MP

Chair of the West Anglia Taskforce

Lord Andrew Adonis
Chair - National Infrastructure Commission
1 Horse Guards Road
London
SW1A 2HQ

Our Ref:
Your Ref:
Telephone: [contact redacted]
E-mail: [contact redacted]
Date: 08 January 2016

Dear Lord Adonis

West Midlands Integrated Transport Authority and West Midlands Combined Authority Shadow Board - Submission on Critical Infrastructure Challenges

We welcome the opportunity to respond to the Commission's Call for Evidence on future infrastructure challenges. However, the West Midlands Metropolitan Area and the Midlands Connect Partnership would like to express serious concerns at the limited nature of the terms of reference which exclude the Midlands infrastructure transport requirements from the scope of this work. Excluding the Midlands' critical infrastructure challenges does not reflect the commitment to rebalance the UK economy or recognise the importance of the Midlands to the national economy.

The 'Midlands Engine' prospectus, as unveiled on 04 December 2015 in Birmingham by Business Secretary *Sajid Javid*, commits Government to back Midlands Local Enterprise Partnerships in promoting jobs and growth, boosting productivity and attracting inward investment whilst recognising the importance of improving the region's infrastructure to increase connectivity.

The Midlands Engine region has an economy of £222 billion each year and is home to over 11.5 million people. The area has played a strong role in the recovery of the UK economy. Over the last year, private sector employment in the Midlands grew more than three times faster than London and the South East.

The Midlands Engine and the Midlands Connect Partnership links the UK to the rest of the world through its network of freight and passenger airports, and connects the country through road network and rail links. Our region's infrastructure is at the heart of the national network and is therefore crucial for the Northern Powerhouse, Greater London and Midlands Engine to fully integrate and further maximise benefits to UK Plc.

Connectivity across the Midlands is essential for supporting and attracting businesses as well as highly skilled workers. Midlands Connect will develop the vision for our regional connectivity and set out the long term transport strategy for the Midlands Engine. Midlands Connect Partnership has identified six "intensive growth corridors" and four major hubs of economic activity across the wider Midlands.

Further to this, the growth and development of Birmingham Airport is of crucial importance both to the West Midlands Metropolitan Area and to the UK as a whole. Enhanced global aviation connectivity will help grow our export led economy still further, securing extra benefits and opportunities for the region. High Speed Two (HS2) will see Birmingham

Interchange station built in close proximity to Birmingham Airport. Enhanced connectivity between the HS2 station and the airport has the potential to generate an additional 750,000 passenger trips per annum at the airport as well as supporting the South East's aviation needs by improving connections to Heathrow via Crossrail at Old Oak Common.

Positive change is happening in the West Midlands Metropolitan Area with the current work of the West Midlands ITA, the emerging West Midlands Combined Authority and our close collaboration with the region's Local Enterprise Partnerships. The announced Devolution Deal will see an unprecedented step change in delivery to support our collective ambitions for economic growth. Transport infrastructure is firmly at the heart of those plans, enabling wider economic and social value.

This submissions reflects the views of the West Midlands Integrated Transport Authority and West Midlands Combined Authority Shadow Board, as well supporting the wider views of the Midlands Connect Partnership area, which has also submitted a technical response submission to the Commission.

We welcome the opportunity to discuss this further with you and the wider Commission members.

Yours sincerely



Cllr Roger Lawrence
Chair of the West Midlands Integrated Transport Authority

**West Midlands Integrated Transport
Authority and West Midlands Combined
Authority Shadow Board**

**Critical Infrastructure Challenges
Submission to Infrastructure Commission**

08 January 2016

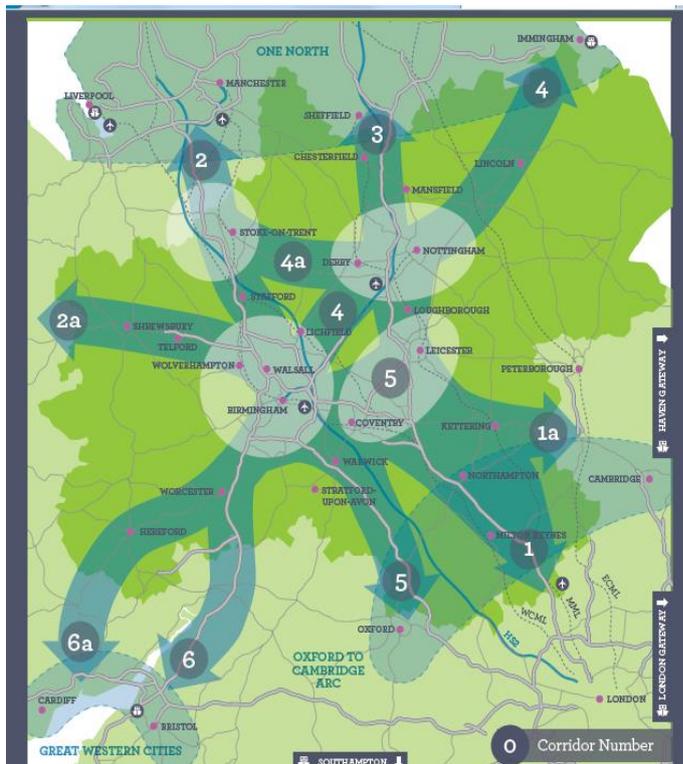
Our Story

The Midlands Engine and the Midlands Connect Partnership links the UK to the rest of the world through its network of freight and passenger airports, and connects the country through its road network and rail links. Our region’s infrastructure is at the heart of the national network and is therefore crucial for the Northern Powerhouse, Greater London and the Midlands Engine to fully integrate and further maximise benefits to UK Plc.

The Midlands has an economy of £222 billion each year and is home to more than 11.5 million people. The area has also played a strong role in the recovery of the UK economy. Over the last year, private sector employment in the Midlands grew more than three times faster than London and the South East.

Connectivity across the Midlands is essential for supporting and attracting businesses as well as highly skilled workers. Midlands Connect will develop the vision for our regional connectivity and set out the long term transport strategy for the Midlands Engine.

The Midlands Connect Partnership has identified six “intensive growth corridors” and four major hubs of economic activity across the wider Midlands. These are shown in the map below.



Evidence from Midlands Connect shows that improved highway reliability and regular average speeds across the Midlands along with higher line speeds on inter-regional rail and highway links can provide an economic benefit to the wider Midlands of up to £800m per annum by 2036 with 143,000 additional jobs when a 10% reduction in general travel times are achieved.

The Midlands has ambitious plans to build on these strong foundations. As the largest infrastructure project in Europe, High Speed 2 (HS2) will be an economic catalyst for the West Midlands with a strong focus on rebalancing the economy from the south east as well as providing the first strategic connections to the north. We are committed to building a transport network that will match the best in Europe and provide the strategic links to the north and the south of the UK.

Response to Critical Challenges - Northern Connectivity

Question 1: To what extent are weaknesses in transport connectivity holding back northern city regions (specifically in terms of jobs, enterprise creation and growth, and housing)?

The analysis supporting our work on Midlands Connect shows large economic benefits from improving road and rail connectivity in the Midlands intensive growth corridors, by reducing the costs of travel, increasing output by facilitating business clustering, and unlocking job creation in our growth areas. This will require concerted action to tackle the connectivity challenges that we have identified.

There are significant connectivity challenges that will constrain the ability of the Midlands to realise its ambitions for growth. Whilst the Midlands lies at the heart of the UK's road and rail networks, the mix of long-distance, regional and local travel needs is placing heavy demands upon them.

The Midlands motorway network is subject to heavy congestion, with traffic delays and poor journey reliability, meaning that businesses, commuters and leisure travellers have to schedule additional time into the journey to give confidence that they can arrive at destinations on time.

This wasted time significantly increases the direct costs of travel, impacts on business productivity and is constraining the potential for business growth. Increased demand for travel in the Midlands will place the system under further strain, increasing costs of travel and constraining job creation. The analysis completed to date as part of Midlands Connect highlights that we will need to tackle congestion hotspots as well as looking at the reliability, resilience and quality of journeys provided by the strategic road networks. Particular pressures include the South East of the West Midlands and the M6 between M54/M6 Toll and Birmingham Central (A38M).

There are fast, frequent rail links connecting large parts of the Midlands to the north and south, via the West Coast, Midland and East Coast Main Lines. However, there are major challenges travelling by rail between the Midlands cities, with long journey times and low service frequencies impacting on connectivity. This is a particular issue for the more rural areas such as The Marches, Worcestershire and Lincolnshire as this makes travel by rail inconvenient, leading to an increased reliance on car travel and reducing the scope for interaction between our cities. In particular, the slow speeds between the key regional cities of Nottingham and Birmingham highlights the need for improvements to be made

to the classic rail networks in advance of HS2 Phase 2 which is scheduled for completion after 2030.

As connectivity between the large urban centres becomes more important in future, these slow speeds will significantly constrain the capacity for growth in the cities across the Midlands. There is also an increasing problem of capacity and crowding on services entering and crossing Birmingham. This will cause problems both in accommodating growth in Birmingham and in improving rail connections across the whole Midlands.

Whilst the commission is focused upon connectivity, the importance of integrating growth plans and transport plans should be also recognised. Improving connectivity for the Midlands will create investment opportunities, but site development viability remains a long term constraint to the central urban areas absorbing the projected growth and realising the estimated anticipated economic benefit. Integrating strategic land use and strategic transport planning is crucially important.

Question 2: What cost-effective infrastructure investments in city-to-city connectivity could address these weaknesses? We are interested in all modes of transport.

At this stage of Midlands Connect we have not defined solutions. With the support from DfT we are now developing the Midlands Strategic Transport Strategy that will set out our priorities with a clear evidence base.

Highways England and Network Rail are in the process of undertaking Route Studies across the Midlands to inform investment strategies post 2020. There are also medium to long-term opportunities to deliver HS2 Growth Strategies to fully capitalise on the opportunities for the whole Midlands. Midlands Connect will provide the mechanism to inform and draw together these elements into a single strategy that delivers much more than the sum of the parts

HS2 will transform north-south travel, bringing Birmingham within 40 minutes and the East Midlands within one hour of London. It will also significantly improve connections between Nottingham and Birmingham. However, it will be critical to develop full connectivity packages to fully capitalise on the opportunities provided by new stations serving the West Midlands, East Midlands and North Staffordshire. It will also be important to reconfigure classic rail services to better meet the connectivity needs of the whole Midlands, including Milton Keynes and Northampton, Coventry and Leicester. However, prior to the arrival of HS2 and in particular the Phase 2 links, it is vital that the classic rail network continues to be enhanced and services improved to enable the continued growth of the Midlands economy.

Investment in Birmingham International Station, for example, in readiness for the arrival of HS2 and associated automated people mover between HS2 Interchange, Birmingham International/NEC and Birmingham Airport, would help optimise connectivity with other cities in the region, north and south. This is subject to one of only two successful 'Connecting Europe Facility' (CEF) grant awards in the UK.

The West Midlands Metropolitan Area has recently developed and adopted the West Midlands Strategic Transport Plan “Movement for Growth” which recognises the important contribution of local public transport services and walking and cycling investment, towards the improvement of strategic route connections. Investment in these modes should not be neglected when considering the wider strategic infrastructure as they are an essential part of the ‘whole journey’ for people and businesses by, amongst other things, providing access to rail connections for commuters and helping reduce local car trips on strategic roads.

Question 3: Which city-to-city corridor(s) should be the priority for early phases of investment?

The West Midlands Metropolitan Area’s population is forecast to grow by 444,000 people by 2035 (Office of National Statistics). This is the size of a Bristol, Liverpool, or Nottingham. The number of new homes which will need to be built to help accommodate this growth over 20 years is in the order of 165,000. The scale of new housing development increases when the wider journey to work area is considered, therefore requiring a joined-up, cross-boundary approach to housing development.

Initiatives to improve the West Midlands Metropolitan Area’s economy, air quality and quality of life all need to be supported by transport improvements. This is in the context of the - still valid - strategic economic priorities for transport policy identified in the Eddington Review:

- 1. Supporting the UKs successful agglomerated urban areas and their catchments**
- 2. Maintaining or improving the performance of the UKs key international gateways**
- 3. The key inter-urban corridors between these places**

In line with the above, there is a need for a successful integrated Metropolitan transport network supporting the growth and development of the West Midlands urban agglomeration with priority city to city/city to town corridors within this network based on the West Midlands High Speed Two Connectivity Programme corridors, which effectively “plug-in” the two HS2 stations to local networks to maximise their benefits for the West Midlands. As HS2 Phase 2 is developed further, there also needs to be access to Toton, effectively plugging the West Midlands into the three HS2 Stations.

Alongside this, a key infrastructure challenge we face is to ensure the effective and reliable operation of the Strategic Highway Network in the West Midlands. This is to serve the West Midlands Metropolitan Area’s regional and national needs whilst simultaneously serving movement of people and goods traversing the West Midlands. Wider use of the M6Toll is required as part of the solution to this challenge: we need to ensure that the M6Toll is better utilised and integrated with the wider highway network.

Better utilisation of the M6 Toll is of critical importance to the Midlands Engine. The West Midlands ITA and West Midlands Combined Authority Shadow Board are committed to working with Midlands Expressway Limited (M6 Toll owners) and Government to look at options for its better utilisation. However, there is a need for the Commission to acknowledge that the M6 Toll has a critical role to play nationally, due to its strategic importance and location on the National Strategic Highway Network.

As part of overall corridor approaches, the role of national and regional rail, including HS2 and rail freight, also need to be considered as priorities, including the Water Orton rail junction improvement which is the main rail passenger and freight bottleneck of the West Midlands network. Midlands Connect will strengthen the proposal to undertake a joint business case for central Birmingham capturing the wider economic benefits underpinning the case for investment. This will be carried out in partnership with Network Rail.

Furthermore, the West Midlands and Chiltern Route Utilisation Strategy requires construction of Camp Hill Chords, additional bay platforms at Moor Street, reinstatement of Platform 4 at Snow Hill as well enhanced infrastructure at Kings Norton Station and on the Water Orton corridor. These all form part of a package of improvements to enhance central Birmingham rail capacity which will bring national, regional and local benefits to the rail network and the economy.

Question 4: What are the key international connectivity needs likely to be in the next 20-30 years in the north of England (with a focus on ports and airports)? What is the most effective way to meet these needs, and what constraints on delivery are anticipated?

The Midlands Engine region accounts for 16% of all UK exports selling to over 178 countries worldwide.

The Midlands Engine region is well linked internationally. Inward investment projects grew by 130% between 2011 and 2015 based on a compelling Midlands offer of commercial opportunity, affordability, connectivity and quality of life. In the same period, the Midlands Engine region attracted 880 Foreign Direct Investment projects creating over 48,000 new jobs and safeguarding a further 23,000.

It goes without saying that connectivity to ports and airports will be vital for continued growth.

The international gateways at Birmingham Airport and East Midlands Airport are critical to the whole Midlands economy. Currently Birmingham Airport acts as a business gateway to major global markets, including China, and East Midlands Airport is the UK's most important air freight hub outside London. Both Birmingham and East Midlands Airports have ambitious growth plans for the future which will support the growth of the wider Midlands economy. Effective surface access links to these hubs are therefore critical to ensure they can operate effectively in the future. Both airports are challenged

in this respect, with East Midlands Airport only accessible via road and Birmingham Airport located adjacent to congested strategic road links and without direct rail links to the East Midlands.

Whilst Birmingham International Station provides a certain level of connectivity between Birmingham Airport and conventional rail services, these should be significantly strengthened through enhanced connectivity and interchange to the wider region and ultimately through the automated people mover and connections to the HS2 Interchange as promoted through the CEF proposal.

The Midlands Engine is also served directly by several ports including Grimsby and Immingham and Boston. Addressing the reliability and speed of connectivity will be essential to improve the efficiency and productivity of our businesses. With 16% of all UK exports there are significant gains to be made.

With the strong export market of the Midlands it is therefore vital to have wider connectivity to national ports. Our work to date has identified that there is a need to address reliability of the links, including enhanced road freight links (with a focus on speeds and reliability), between the Midlands logistics and manufacturing hubs and ports including Humber, Haven Gateway, Southampton, Bristol and Liverpool. Key sections of the network that need addressing include the M6, M5, A14, Birmingham Box and onward connections to ports such as Southampton.

Question 5: What form of governance would most effectively deliver transformative infrastructure in the north, how should this be funded and by whom, including appropriate local contributions?

The current proposals regarding Sub-National Transport Bodies and Combined Authorities (at regional levels) are appropriate and effective forms of governance in the Midlands Engine region to deliver our transformative infrastructure.

London's Transport Infrastructure

Question 1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

-

Question 2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

-

Question 3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

-

Question 4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

-

Question 5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

Other successful global economies ensure all of their major metropolitan areas have world class urban and regional transport systems and effective national and international connectivity, including links with the capital city. A lesson for London is to ensure an effective HS1 – HS2 link in London to allow direct international high speed rail services for major metropolitan areas of the UK.

National Infrastructure Commission call for evidence: London's transport infrastructure

Written evidence submitted by Chairman of Western Rail Access to Heathrow Stakeholder Steering Group

Introduction

The Western Rail link to Heathrow is a scheme confirmed in the Hendy Review as a priority for delivery yet with completion delayed to c 2024. This scheme has been in development and promoted by Thames Valley Berkshire LEP and its predecessors to answer the needs of business and leisure passengers to reach Heathrow by rail from the west. The scheme is supported by business and local authorities across the south west, south Wales and Thames Valley representing the business and residential communities whose access to Heathrow will be approved when the scheme is delivered.

The scheme also offers the opportunity to create a through route from the west to Paddington so enhancing capacity, resilience and passenger options and generating benefits to London and its hinterland beyond those originally planned and forecast.

A western rail link to Heathrow is deliverable, affordable and sensible solution to an acknowledged gap in the UK's strategic transport infrastructure. The link can be delivered in a relatively short period of time, requires minimal disruption to the existing transport network, existing properties and has minimal visual impact.

Although the scheme has been confirmed in the Hendy review it has met regular delays and requires drive from government through the DfT, BIS and Treasury. The business case is strong and ROI swift. The benefits to UK plc justify its urgent delivery.

Heathrow is one of the few international hub airports which does not have access to the economic hinterland of its city location. The economic importance of such a link is demonstrated by:

- 70% of foreign owned businesses establishing in the UK locate within 60 minutes of Heathrow;
- 75% of businesses in the Thames Valley state proximity to Heathrow as the primary factor for their choice of location;
- 202 of the UK's top 300 companies are located within 25 miles of Heathrow.

The opportunity of improving the connectivity and speed of access to Heathrow and to London of 12 million people across the South West, South Wales, West Midlands, South Coast and Thames Valley is being missed.

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

We question the reference to commuter hinterland. We would ask that the commission recognises the interdependencies in the commuter patterns and business structures and recognises the strength of and access to a wide economic hinterland as offering additional benefits to greater London.

- Transport – The west is relatively well served by rail transport links in to and out of London but lacks the rail transport infrastructure to make orbital journeys around London. The Western Rail Link to Heathrow scheme due to be delivered by the end of Network Rail's Control Period 6 programme is a vital link for the wider Thames Valley and further afield in providing a direct transport link to Heathrow.
- Economy – Access to and from business, labour and employment in the hinterland will add to the London's critical mass as a global centre, provide supply chain opportunities and other synergies.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?

What might their potential impact be on employment, productivity and housing supply in London and the southeast?

The **Western Rail Link to Heathrow (WRLtH)** scheme offers economic and environmental benefits to London by strengthening its economic hinterland as well as offering very significant benefits to the hinterland. It will improve access to Heathrow for 12 million people to the west of London, particularly the Thames Valley and including the far south west and south Wales. It has the potential to deliver a through route to Paddington via Heathrow.

- The business, economic and environmental case for the scheme, first assessed in 2011 and now being refreshed and based on the current two runway airport, is strong – £1.5 billion of efficiency savings, £800 million of additional economic activity, 42,000 new jobs, modal shift from road to rail, one million fewer road journeys and 5,200 tonnes less CO2 released into the atmosphere – and are projected to be stronger.
- The scheme is particularly important in retaining and attracting major business to the Thames Valley and beyond. 75% of businesses state access to Heathrow as a primary factor in their choice of location
- The maintenance and enhancement of the strength of the economic hinterland will have additional benefits to London. The potential modal shift of traffic to Heathrow from road to rail (currently estimated at c20% from Reading and Slough) will have a positive impact on traffic flows on the strategic road network to the immediate west of London.
- The scheme is now anticipated to enable an additional through route from the west to Paddington, so creating added capacity, resilience and passenger options on the rail network and potential greater modal shift. This will have additional economic and environmental benefits to London and the hinterland.
- The scheme has been confirmed in the Hendy Review but to a later timetable. This largely reflects the past and recent delays in delivery. It will now not be operational until 2024 delaying the realisation of these significant benefits and potentially deterring business commitment further. . It was originally anticipated that the scheme could be open for use before 2020.

Action: We would like to see the National Infrastructure Commission reviewing the scheme delivery plan and working with delivery agencies to identify and implement actions that bring forward the operational date. Schemes which have a strong business case, strong local and regional support, and a clear identified need should be prioritised.

Action: We would like to see the National Infrastructure Commission reviewing the Development Consent Order (DCO) process in general to look at the burdens and delays inherent within the process to identify ways in which it can be streamlined.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

No comment.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?

What innovative funding mechanisms could be considered to support delivery of key schemes?

No comment.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

No comment.

Contact: Ruth Bagley, Chairman Western Rail Link to Heathrow Stakeholder Steering Group

[email redacted]

Submission dated: 8 January 2016

7th January 2016

Lord Adonis
National Infrastructure Commission
1 Horse Guards Road
London
SW1A 2HQ

Submission from Westminster City Council to the National Infrastructure Commission

Dear Lord Adonis,

Westminster City Council is grateful for this opportunity to contribute to the work of the National Infrastructure Commission and, as the local authority at the heart of the UK's global capital, we hope that we can form a strong and constructive relationship with the Commission moving forward.

Central London is the engine of the UK economy: Westminster alone functions as a national and international centre for business, shopping, arts and culture and entertainment; houses over 600,000 jobs, 15% of all of London's employment; and generates 4% of UK GVA. Infrastructure is critical to maintaining and enhancing this contribution for the benefit of UK plc: it is essential that efforts to define strategic infrastructure priorities should properly reflect the national importance of the centre of London and that this is reflected in a locally responsive and sophisticated approach to infrastructure investment in the capital. The role of London boroughs, including Westminster, in steering this investment is critical.

This response is a brief contribution on the strategic options for future investment in large-scale transport, including public realm infrastructure improvements across London and energy supply and resilience.

This year, London surpassed New York in the Global Financial Centres Index, claiming the no. 1 spot.¹ However, of the ranking criteria London's infrastructure is rated as underperforming, potentially casting doubt on the perception that the city is serious about its growth ambitions.

Transport and public realm infrastructure are critical to enabling and facilitating the planned growth required across London. Devolution of Government finances and powers will play a key role in making this happen. Westminster City Council supports the significant investment being made in transport and public realm infrastructure in response to increasing residential and working

¹ The instrumental factors used in the GFCI model are grouped into five key areas of competitiveness (Business Environment, Financial Sector Development, Infrastructure, Human Capital and Reputational & General Factors) http://www.longfinance.net/images/GFCI18_23Sep2015.pdf

populations and London's continued global-city status. However, the future of London's transport infrastructure is not limited to high-profile, large-scale investments, but also depends critically on improving the way in which investment in existing infrastructure is prioritised, directed and delivered. It is essential that the planned reforms to the local government finance system, including the larger role envisaged for boroughs in the commissioning of capital projects, provides London with the fiscal autonomy to weigh up competing priorities and direct public and private investment in a way which maximises benefits relative to costs.

In particular, boroughs could significantly enhance the potential benefits of large scale infrastructure investment **if long-term, predictable and real financial incentives are made available**. Areas such as the West End of London, the economic and cultural heart of the capital, provide particular opportunities to leverage investment through innovative thinking. Westminster City Council is working with partners, including Transport for London, the Greater London Authority, the London Borough of Camden and the private sector, through the West End Partnership to provide greater strategic leadership and a common voice for the West End. We outline below some ideas on realigning growth incentives and leveraging investment in key infrastructure schemes in the West End, in conjunction with the opening of Crossrail 1 and the development of Crossrail 2, which we would be very interested to discuss further with the Commission.

Similarly, a secure, resilient and planned energy supply is a critical factor in London and Westminster's growth. The resilience and sufficiency of energy supply is a major reputational and practical risk to economic growth and performance in the West End in particular, with theatres and other businesses experiencing power outages and major constraints placed on future growth and development by insufficient energy supply. Over the past year, the Greater London Authority has worked with the Number 10 Policy Unit, HM Treasury, the Department of Energy and Climate Change, UK Power Networks and the Core Cities to develop potential new arrangements for the required investment, discussed further below.

An integrated approach to both these issues will be essential to meeting the economic, environmental and social demands of a rapidly growing global city. We look forward to working with the Commission on these challenges and we would be very happy to meet and discuss our response in more detail if it would be helpful.

In the meantime, if the Commission has any questions or would like more detailed information or analysis on any of the points touched on briefly below then please do not hesitate to contact me.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'P. Roe', with a horizontal line extending to the right.

Cllr Philippa Roe

Leader of Westminster City Council

Transport infrastructure in London

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

The economic and social challenges facing London are well articulated in various strategic documents, including the Mayor's London Infrastructure Plan 2050 and Westminster City Council's City Plan. Key points include:

- The number of people who live and work in London is rising rapidly. In February 2015, the capital reached its highest population ever – 8.6 million people – and is set to grow to 10 million by 2030. Such significant growth means that large amounts of development will be required for the foreseeable future, including in areas such as affordable housing and transport.
- A clear set of policy approaches will also be required to address the socio-economic and environmental challenges that will be created or exacerbated by this rapid growth. These include the potential for a growing polarisation of the labour market and skills gap; addressing issues around air quality, climate change, heritage and residential amenity; and ensuring that investment – including foreign direct investment, on which London's comparative position has weakened in recent years – is directed to areas of need.

The density of activity and daytime population of central London means that it is particularly impacted by these points; at the same time, however, there is significant potential for well-targeted infrastructure investment in central London to help address these issues across the capital and beyond. In particular:

- Infrastructure will be required to alleviate severe overcrowding on London and the South East's rail networks including on Network Rail and London Underground services
- In central London, managing the dispersal of people from London Euston once High Speed 2 (HS2) opens in 2033 requires investment on the scale of Crossrail 2 (CRL2) as well as public realm investment to mitigate pedestrian pressures; similar measures will be required in light of a decision on airport capacity in the South East
- Inevitably, a city with a more diverse, older, population means that inclusion and accessibility will become increasingly important issues

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

- *How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?*
- *What might their potential impact be on employment, productivity and housing supply in London and the southeast?*

In central London, considerable growth will be accommodated within the Central Activities Zone (CAZ) and the City Council is working alongside the LB of Camden, the GLA/TfL, the private sector and development industry through the West End Partnership (WEP) to deliver significant investment in the West End to support and encourage that growth.ⁱ For example, at Tottenham Court Road £1bn of improvements are being delivered through the development of Crossrail 1 (CRL1), the biggest investment in the West End in recent times, which is fully supported both regionally and locally.

Large-scale transport infrastructure investment should be prioritised in a way which allows for alignment with identified development opportunity areas. For example, Paddington, Victoria and Tottenham Court Road are designated as Opportunity Areas (OAs) both within the Westminster City Plan (November 2013) and the Mayor's London Plan (March 2015) and are considered to have significant capacity to accommodate new housing, commercial and other development linked to existing or potential improvements to public transport accessibility. For example, the Victoria Opportunity Area is projected to provide at least 1,000 new homes and 4,000 new jobs from 2011 to 2031; similarly the Tottenham Court Road Opportunity Area is projected to accommodate at least 400 new homes and 5,000 jobs from 2011 to 2031. Victoria is changing from an area previously dominated by Government Departments to an area in which banking, finance and corporate HQ buildings wish to locate, while the Tottenham Court Road area has a more varied economy (including a world renowned creative sector in Soho as well as being a major tourist destination).

However, large scale infrastructure improvements will not, in themselves, maintain London's position as a successful global city. London already has well-established transport infrastructure and the prioritisation of investment should also seek to improve what is already in place. For example, some areas of London have good transport links but low levels of housing and commercial density.

An integrated, balanced approach to transport and development modelling and investment appraisal is needed in order to unlock sustainable development and address the effects of transport infrastructure on investment decisions, growth and productivity. This will need to be sufficiently sophisticated to balance a range of investment needs, including investment in walking and cycling facilities and public transport (such as radial routes in outer London and the proposed extension of the Bakerloo Line); social infrastructure and technological innovation such as greater uptake of electric vehicles in commercial fleets and private use. We strongly support the development of an integrated transport modelling framework, collaboratively with TfL and the London boroughs, to prioritise infrastructure investment for such a complex, historic and dense city. This includes looking across environmental and public health-related, as well as economic and transport-related, policy drivers in order to set out the right collective investments in current infrastructure, potentially including ambitious walking and cycling strategies to keep London moving.

3. What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?

The City Council is a longstanding supporter of Crossrail 2 (CRL2). CRL2 presents an opportunity to help alleviate severe overcrowding on London and the South East's rail networks including Network Rail lines and London Underground lines. London's population is projected to reach 10 million by 2030 and supporting and maintaining a functioning, accessible and inclusive transport system for this population is a key priority for us.

However, we are currently seeking assurances that a proper assessment of the distinctive impacts and benefits for CRL2, and how these are mitigated or harnessed, will be undertaken at the various stages of the project, not just at its outset. Growth from CRL2 must recognise the need to improve existing situations as well as provide new opportunities. This should include a proper assessment of local impacts as well as route-wide effects to ensure that funding and delivery mechanisms for necessary mitigation or improvement measures are properly accounted for. Clear borough involvement from the outset in relevant governance mechanisms is critical in this regard.

Managed effectively and collaboratively, CRL2 can maximise its anticipated benefits, providing a vehicle for effective integration and planning of transport systems across London to enable major development and job creation:

- Through effective coordination of the delivery of CRL2, there is a significant opportunity to make better use of our current transport system and help relieve congestion on existing railway lines (including Underground lines) to reduce pressures across London. A key example is CRL2's role in managing the dispersal of people from London Euston once High Speed 2 (HS2) opens in 2033.
- There is potential to draw on the lessons of CRL1 to maximise the integration of public realm/transport interchanges and property development above and around CRL2 stations, including commercial, retail and residential development, delivered in partnership between the private sector, local authorities and other agencies (building, for example, on the new partnership arrangement between Transport for London and Network Rail for CRL2 itself). There are two CRL2 stations proposed within Westminster at Victoria and Tottenham Court Road, identified as having capacity for major housing growth, regeneration and job creation which should be supported by investment in public transport infrastructure. CRL2 is central to the West End Partnership (WEP)'s ambitions to integrate, coordinate and deliver £500m of improvements around Tottenham Court Road, including improvements to the public realm in and around the new CRL2 station entrance to create better pedestrian spaces and new walking routes. Understanding the role of property value uplift and how this can be used to maximise the benefits of investment will be essential.
- CRL2 presents significant opportunities for more employment across London, allowing for improved accessibility to employment as well as contributing to local job creation, including but not limited to construction works. Westminster's objectives in terms of employment include upskilling our resident population and removing barriers to employment for our residents, especially in the north of the city which has high levels of deprivation. Lessons should be drawn from Crossrail Limited's work with local employment brokerages, the Tunnelling and Underground Construction Academy (TUCA) and its role in offering opportunities to unemployed

residents within boroughs along the route. To make this activity more sustainable, viewing employment and skills activity as an integral part of infrastructure investment packages has significant potential to unlock new models of investment and delivery, including the potential for the sharing of risk and reward between London and HM Treasury in order to reinvest savings from reducing unemployment into successful local programmes.

4. What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?

- *What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?*
- *What innovative funding mechanisms could be considered to support delivery of key schemes?*

The main barrier to unlocking development opportunities is the availability of funding to implement projects and/or attracting sufficient private sector investment. Social infrastructure, such as housing, education and health facilities, will also be placed under more demand by a growing population – with an increasing number of older people – and will need to be addressed concurrently. In addition, the focus on capital and infrastructure operating costs should not obscure the importance of revenue spending required to manage and maintain public realm including maintaining heritage and cultural assets and facilitating services such as waste disposal, budgets for which are under severe and rising pressure.

Boroughs could significantly enhance the potential benefits of large scale infrastructure investment **if long-term, predictable and real financial incentives are made available**. Individual boroughs, and in particular Westminster, are in the best position to promote inclusive growth that generates direct benefits from London wide transport and infrastructure investment. There is a tremendous opportunity to bring together a number of different levels of public sector delivery of infrastructure by combining national, regional and sub-regional funding investment streams. Transport budgets for London, already partly made up from a proportion of business rates, could be further devolved and be part of a mix of other funding streams such as Tax Increment Finance, a more nuanced ‘growth accelerator’ financing model including broader economic targets such as reducing long term unemployment, a visitor levy or a share of climate change levy revenues. Such models could help create an incentive for growth in those areas that otherwise make no direct gain but incur new budgetary pressures. We would be interested to discuss this further as we believe that with the right financial package, Westminster through the West End Partnership, could unlock significant growth across the West End in coordination with the opening of CRL1 and CRL2.

5. How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?

The Global Financial Centres Index, the Economist Units Liveability Analysis and the European Cities Monitor all provide useful perspectives on these questions. Ernst and Young track this form of competitiveness and there is now strong competition particularly from German cities. Lack of skills and the comparative costs of doing business are among the key challenges for London.

Germany has one of the world's largest and most sophisticated transportation systems. Whilst there is a split between Government funding and Public Private Partnership funding, a national transport infrastructure funding agency (Verkehrsinfrastrukturfinanzierungsgesellschaft) was established in 2003 whose task it is to distribute the income from road tolls among road, rail and waterways and to support projects realised under a public-private funding scheme. Redistribution of cost and demand is something Westminster is particularly interested in and we would be keen for the Commission to explore this model in more detail.

<http://www.internationaltransportforum.org/statistics/investment/Country-responses/Germany.pdf>

We are also interested in exploring the other examples put forward in London Councils' response:

- PwC's Funding and Financing Study explores in depth international models for funding infrastructure, which have been considered for their applicability to London.
- Toronto, Canada, is responding to its city congestion problems with a two-stage investment in its transport system, focusing on bringing economic growth and job creation. It will build, extend and upgrade a series of light rail, underground and bus routes over a 25 year period.
- Paris is establishing a city-regional authority to improve its city transport connectivity with its suburbs. It is building a Grand Paris Express to link the centre of Paris with its airports and major economic areas in the greater Paris region.

Electricity interconnection and storage

1. What changes may need to be made to the electricity market to ensure that supply and demand are balanced, whilst minimising cost to consumers, over the long-term?

•What role can changes to the market framework play to incentivise this outcome: •Is there a need for an independent system operator (SO)? How could the incentives faced by the SO be set to minimise long-run balancing costs?

•Is there a need to further reform the “balancing market” and which market participants are responsible for imbalances?

•To what extent can demand-side management measures and embedded generation be used to increase the flexibility of the electricity system?

Energy infrastructure is a particularly pressing issue for Westminster. Our work with UK Power Networks on their future Business Plan suggests an urgent need for investment of at least £400 million in electricity supply infrastructure in central London, and the Mayor is already aware that existing shortfalls are particularly constraining growth in Victoria and the West End, including causing power outages affecting theatres and other businesses. Given this we have taken a leading role in working with the Mayor to support the case for the provision of infrastructure in advance of development actually taking place, and have written to Ofgem to reinforce the case for the changes to the regulatory regime needed to achieve this.

We strongly endorse the move towards locally produced energy. There is a role for the Mayor in pushing for a regulatory regime more supportive of local decentralised energy provision. We also note that electricity demand driven by the decarbonisation agenda may rise dramatically. Therefore, carbon taxes will continue to be an important tool in ensuring a switch to lower carbon electricity and further investment into researching energy storage. Continued investment is also required in carbon storage capacity and technology, perhaps combined with subsidy for small scale electricity generation.

Over the past year, the Greater London Authority has worked with the Number 10 Policy Unit, HM Treasury, the Department of Energy and Climate Change, UK Power Networks and the Core Cities to develop new arrangements for the required investment ahead of demand. Two potential models emerged (see below) and we recommend that the Commission continues to develop these ideas as part of its review into these strategic challenges:

- One approach would be to allow distribution network operators to seek Ofgem’s approval for increased investment in a specific area, but on the basis that the cost of the accelerated investment would be recovered from connecting customers as they emerge.
- The second option, which the GLA developed in conjunction with the Infrastructure UK team at HM Treasury, is based upon a private development company being established, potentially by a local or strategic authority in respect of any area, to fund up front investment. This would be done on the

basis that the company recovers costs as connections are made by developers, with an additional premium to attract the required investment.

The London Electricity Infrastructure Review, a Technical Working Group Report by Ramboll, also makes several points which we suggest that the Commission also look at in detail:

- The essential change is for investment in London's electricity infrastructure to become more proactive. Infrastructure providers should have greater engagement in development strategies in order to fulfil a role that actively facilitates growth and anticipates demand rather than inhibiting by being reactive.
- The current application of the price control framework discourages proactive investment. A change in emphasis could facilitate such investment.
- The primary constraint in central London, physical space, will require co-operation by many public and private sector bodies in order to find a solution.
- Arguably, the initial phases of a strategic solution are partially underway with the reinforcement work being undertaken by National Grid in north London. This will pave the way for new bulk supply routes to new substations serving consumer voltages, as identified in UKPN's business planning for the next 10 years, but insufficient timely investment in the development of London's distribution network presents serious risks to London's economic growth, regardless of this current reinforcement work.

2. What are the barriers to the deployment of energy storage capacity?

•Are there specific market failures/barriers that prevent investment in energy storage that are not faced by other 'balancing' technologies? How might these be overcome?

•What is the most appropriate scale for future energy storage technologies in the UK? (i.e. transmission network scale, the distributed network or the domestic scale.)

Gas prices are a major determining factor in the cost of energy. Energy storage capacity, particularly in the form of alternative and "reserve" sources of energy, are exposed to the volatility of gas prices. Because of this dominance, the future scale of energy storage capacity will need to be large – however, a strategy that includes all three scales (transition, distribution and domestic) would balance the risk of a lack of technological progress in one area.

There is also a need for legislative change to require utilities to cooperate with boroughs' (and the Mayor's) strategic planning and to enable London level scrutiny and approval of utility franchises to meet these objectives. We welcome the steps the utilities have taken to work with the City Council and to recruit 90 local staff. In a recent response to Ofcom on broadband provision we called for a 'duty to cooperate' between utility companies and local authorities and believe this would be particularly beneficial in regards to energy provision.

Our work with partners in this area makes clear the need for all London stakeholders to accelerate thinking about the future direction of energy provision and infrastructure over the medium-to long-

term, moving towards a “smart grid” to enable the most effective use to be made of existing (and help manage the need for new) infrastructure while providing choice and better value for consumers.

3. What level of electricity interconnection is likely to be in the best interests of consumers?

•Is there a case for building interconnection out to a greater capacity or more rapidly than the current ‘cap and floor’ regime would allow beyond 2020? If so, why do you think the current arrangements are not sufficient to incentivise this investment?

•Are there specific market failures/barriers that prevent investment in electricity interconnection that are not faced by other ‘balancing’ technologies? How might these be overcome?

One important market failure which we would highlight is a lack of clarity around return on investment. Investors are not clear on the longer term public sector appetite, or the market potential, for new technology. As part of its work the Commission could usefully consider how this could be addressed.

National Infrastructure Commission – Call for Evidence

London's Transport Infrastructure

- The UK's most valuable infrastructure is our “green and blue” infrastructure — the natural capital that supports communities, nature and economic activity. As such the need to protect and enhance natural infrastructure should underlie all the work of the National Infrastructure Commission.
- Development of new infrastructure can deplete our natural infrastructure, increasing risks like flooding, and damaging ecosystems. However, if designed and managed appropriately new infrastructure can benefit our built and natural environment and help it to be resilient to a changing climate and increasing population.
- This should be facilitated by coordinated action. For example, the Commission should consider linkages between its consideration of the London Transport System and other London strategies and plans, including the London Sustainable Drainage Action Plan and the aims of the London Green Infrastructure Taskforce.
- The Commission should consider how changes to the London Transport System can offer multiple benefits for example flood risk, biodiversity, and health and well-being. This can be done through incorporating well designed sustainable drainage systems.

Introduction

We welcome the formation of the National Infrastructure Commission. This task should not be undertaken in isolation, but considered alongside the wider built and natural environment. Infrastructure needs to be resilient to our changing climate, increasing urbanisation and population and it needs to work with the environment and communities.

The Issues

- The Highways Agency estimates that 70 per cent of earthworks failures are due to deficiencies in the drainage system. Similarly, London Underground considers that drainage-related issues are responsible for the vast majority of significant earthwork failures over the last 20 years.
- Less than a quarter of our water bodies are considered healthy. In order to reach water quality targets established in the Water Framework Directive, it is important that any growth in infrastructure does not lead to the deterioration in our water bodies. Much transport infrastructure such as roads cause a significant amount of water runoff. This runoff not only carries pollutants with it but severely impacts the capacity of our drainage systems resulting in increased combined sewer overflows allowing untreated sewage to flow directly into our rivers and oceans. In addition once our drains reach capacity it can cause surface water flooding carrying pollutants with it.

- 60 per cent of species we know about are in decline; as with all new development there are opportunities to help reverse this decline and help achieve our biodiversity targets. The National Infrastructure Commission should ensure that its recommendations make the most of these opportunities.
- As the climate changes, we are expecting an increase in winter rainfall and also an increase in the number of severe rainfall events. Combined with a reduction in permeable surfaces through the need for increase in housing, this will result in increased risks from surface water flooding.
- In London, the role of managing surface water flood risk lies with Lead Local Flood Authorities which are generally London Borough Councils. Lead Local Flood Authorities have produced Surface Water Management Plans (SWMPs) which gives the roads authorities clear roles where the roads form a key part of the drainage or alleviation of flood risk. Roles include retaining data relating to location and serviceability of existing road drainage; designing road drainage to minimise surface water runoff; and planning exceedance routes using roads surfaces for overland flow. It is important that when looking at growth of the London Transport System that Lead Local Flood Authorities are consulted and areas of high flood risk are avoided.

The London Transport System

Transport infrastructure in London is vital to the city. It is vulnerable to extreme weather events such as flooding, but it can also add to this risk. In considering the development of new infrastructure we need to ensure that it does not increase flood risk.

In the period from 1992 to 2003, over 1,200 flooding incidents and 200 station closures were recorded by London Underground Limited. Of these approximately half were related to flash flooding. Flooding of the London Underground between September 1999 and March 2004 cost approximately £14.6 million in passenger delays. Our current drainage system is struggling to cope and increasing storm events will require significant modification to maintain even current service levels. **The National Infrastructure Commission should ensure that it adequately considers the sustainability of its proposals and recommend appropriate investment in natural infrastructure.**

There are many existing plans and strategies in London, notably the London Infrastructure Plan and the draft London Sustainable Drainage Action Plan. Any consideration of London's Transport System needs to take such plans into account. For example, the draft London Sustainable Drainage Action Plan states *"transport sector buildings can lend themselves to green/brown roofs and also realise the benefits of insulation and reduced long-term maintenance"* and that *"retrofitting sustainable drainage should form part of already planned maintenance, repair and improvement programmes"*. The Government's Manual for Streets (2007) stated that *"the use of SUDS is seen as a primary objective by the Government and should be applied wherever practical and technically feasible"*. These insights should be reinforced by the Commission.

The London Infrastructure Plan places high emphasis on improving the London Transport System but also on delivering a network of green infrastructure to provide flood protection, shade, biodiversity, cleaner air, a greener environment visually, pedestrian and cycling routes and space for recreation. These two should not be seen in isolation. **The National Infrastructure Commission should consider how improving the London Transport System can at the same time improve London's green**

infrastructure network. Sustainable drainage systems if designed and managed appropriately are themselves an important form of green infrastructure.

Walking and cycling are important modes of travel, offering a more sustainable alternative to the car. **Safe routes for walking and cycling should be considered as part of London's Transport System.**

All stages of the development of major projects such as Crossrail 2 should include consideration of ways to enhance natural infrastructure and resilience. This should include the design of projects and the sourcing and disposal of building materials; Crossrail set an important precedent in this regard through its association with the Wallasea Island project, which made good use of spoil and contributed to natural flood defences and biodiversity. This kind of large-scale ambition should be repeated and matched by attention to more local resilient design options in new projects, including sustainable drainage.

Sustainable Drainage Systems (SuDS)

It is important that our transport infrastructure does not negatively impact on other vital infrastructure, including our drainage systems. Yet transport infrastructure can also help alleviate this risk through incorporating sustainable drainage systems into design and management. If these are designed appropriately they can also deliver benefits for wildlife and society.

Sustainable drainage systems seek to manage rainfall in a way similar to natural processes, by using the landscape to control the flow and volume of surface water, prevent or reduce pollution downstream of development and promote recharging of groundwater. Sustainable drainage systems can be vital areas of habitat and stepping stones for wildlife in the urban environment and can also reduce the urban heat island effect and improve the quality of the water passing through it. This also plays a role in making the urban environment more aesthetically pleasing and providing health and well-being benefits.¹

London is also in an area of water scarcity and with climate change we are expecting hotter summers. In considering sustainable drainage systems within the transport system these measures can help with water resource management through rainwater harvesting and reuse. Such SuDS techniques can capture, or harvest, rainwater which can then be used for functions that do not require treated water, such as flushing toilets and irrigation. In addition using methods such as green roofs, recreational roofs, wildflower blankets and green walls can replace some of the evaporative cooling lost through urbanisation.

The National Infrastructure Commission should consider sustainable drainage systems within their plans for the London Transport System so that infrastructure is resilient to climate change, alleviates pressure on drainage infrastructure, and also benefits wildlife and communities.

Case studies

- A green roof was retrofitted onto a tube depot in Ruislip gardens and water runoff rates were compared with a control roof. The green roofs reduced the peak flow to under a

¹ WWT has created guidance on how to design sustainable drainage systems for multiple benefits. It can be downloaded from http://www.wwt.org.uk/uploads/documents/1400927422_Sustainabledrainagesystemsguide.pdf

quarter of that of the control roof and delayed the peak flow time up to 2 hours 45 minutes. The green roofs were additionally designed to encourage pollinating species.

- Nottingham Green Streets project designed to capture runoff from 5500 m² of highway from a total surface area of 7100 m². The scheme was designed to manage surface water runoff from a 1:30 year event and to always intercept and treat the, often polluted highway runoff. Evidence indicates a 33 per cent reduction in the flow reaching the sewer during a 1 in 1 return period storm.
- If designed and managed correctly sustainable drainage systems can be more cost effective than installing traditional drainage systems. For example costings for incorporating SuDS into the development of a rail freight terminal in Telford, Shropshire were compared with traditional sewerage costs. To incorporate SuDS rather than sewer features catering for a 1 in 30 year flood event would result in savings in the order of £253,000 (for basic works costs excluding preliminaries and design and supervision and removes the effects of the disposal of surplus material).

The SuDS have been accommodated within areas that would have been used for landscaping and have enhanced the attractiveness of the Terminal. The SuDS features have also provided enhanced habitats and helped to secure a more continuous green network through the site with positive effects on biodiversity. The slow conveyance and attenuation of flows help to remove pollutants and reduce the diffuse pollution load which would otherwise have been carried by the surface water sewer system into the watercourses. In addition it is believed that the use of SuDS has saved in excess of 100 HGV journeys (probably significantly more) or in excess of 8,000 vehicle miles.

As most of the SuDS features are visible within the site, they are subject to daily oversight by the staff. All aspects of the inspection and maintenance of the SuDS system are capable of being safely undertaken by the staff of the Terminal or outside landscaping contractors. With a piped system, diagnosis and location of the source of pollution in pipe networks can be very time consuming and expensive. A piped system would require at least an annual visit by specialist contractors. This may require several days if pipe jetting is required. Potentially unscheduled, reactive visits may be needed as well e.g. to respond to blocked gullies or choked flow control devices.

Concluding remarks

We recommend that National Infrastructure Commission considers its remit as part of the wider built and natural environment and promotes the development of infrastructure that is resilient to climate change, and contributes to biodiversity and resilience. We recommend the use of sustainable drainage systems wherever possible which are designed to optimise multiple benefits, reducing flood risk, reducing the urban heat island effect, improving water runoff quality, providing biodiversity benefits and providing communities with an enhanced sense of place and wellbeing.

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National Infrastructure Commission Call for Evidence

Woodland Trust Response

January 2016

The Woodland Trust appreciates the opportunity to respond to the National Infrastructure Commission call for evidence. We recognise the importance of a modern infrastructure system and as such are disappointed that the questions do not make any reference to the importance of green infrastructure and the need to design infrastructure in ways that respects the landscapes and habitats that have done so much to shape our national identity. We hope that our submission will show the Commission that green infrastructure, particularly irreplaceable ancient woodland and newly planted woods and trees need to be a key component in the Commission's considerations on long term infrastructure provision, as per the Government's manifesto promise to 'protect your countryside, green belt and urban environment'.

As the UK's leading woodland conservation charity, the Trust aims to protect native woods, trees and their wildlife for the future. Through the restoration and improvement of woodland biodiversity and increased awareness and understanding of important woodland, these aims can be achieved. We own over 1,250 sites across the UK, covering around 23,000 hectares (57,000 acres) and we have 500,000 members and supporters.

Ancient woodland is defined as an irreplaceable natural resource that has remained constantly wooded since AD1600. The length at which ancient woodland takes to develop and evolve (centuries, even millennia), coupled with the vital links it creates between plants, animals and soils accentuate its irreplaceable status. The varied and unique habitats ancient woodland sites provide for many of the UK's most important and threatened fauna and flora species cannot be re-created and cannot afford to be lost. As such, the Woodland Trust aims to prevent the damage, fragmentation and loss of these finite irreplaceable sites from any form of disruptive development.

Connecting Northern Cities

1. To what extent are weaknesses in transport connectivity holding back northern city regions (specifically in terms of jobs, enterprise creation and growth, and housing)?

No Comment.

2. What cost-effective infrastructure investments in city-to-city connectivity could address these weaknesses? We are interested in all modes of transport.

The Trust would prefer to see investment in public transport solutions rather than road building. Such an approach would minimise environmental impact.

3. Which city-to-city corridor(s) should be the priority for early phases of investment?

The Trust cannot comment on specific city to city connection priorities. But we would like to raise the issue of the importance of considering the natural environment from the outset. Whilst the Trust recognises that the development of infrastructure is critical to meet the needs of the growing population, we ask that it is done with due consideration of the natural environment. The Trust is concerned that the Commission's current approach is to consider hard infrastructure needs in isolation from the natural environment. This is reflected by the questions within this consultation. None of them make any reference to the wider environment, whereas the Trust believes the natural environment – both its protection and enhancing its ability to deliver vital ecosystem services to society - should be a starting point for all decisions on the infrastructure provision. This is essential to delivering the current government's manifesto commitment that 'we will build infrastructure in an environmentally sensitive way'

The Natural Environment White Paper (NEWP) published in 2011 must be at the heart of all infrastructure decisions. It outlines the Government's vision for the natural environment over the next 50 years and informs key areas of policy development in relation to conservation and biodiversity. This includes a Government commitment to "providing appropriate protection to ancient woodlands." In addition the NEWP confirms that "Departments will be open about the steps they are taking to address biodiversity and the needs of the natural environment, including actions to promote, conserve and enhance biodiversity."

The NEWP also says "We will move progressively from net biodiversity loss to net gain, by supporting healthy, well functioning ecosystems and establishing more coherent ecological networks."

The evidence on which the Government has based these key policies in the Natural Environment White Paper is found in the Lawton Review. This recognises the importance of habitat networks, and reducing fragmentation of habitats. The review also stated that the government must "provide greater protection to other priority habitats and features that form part of ecological networks, particularly Local Wildlife Sites, ancient woodland and other priority BAP habitats".

Careful ecological assessments and planning at an early stage can minimise damage and ensure that needed infrastructure and mitigation works are as effective as possible in enhancing biodiversity and public access.

The Trust seeks assurances that the Commission is taking these considerations into account at the earliest possible stage.

4. What are the key international connectivity needs likely to be in the next 20-30 years in the north of England (with a focus on ports and airports)? What is the most effective way to meet these needs, and what constraints on delivery are anticipated?

No Comment.

5. What form of governance would most effectively deliver transformative infrastructure in the north, how should this be funded and by whom, including appropriate local contributions?

To be truly transformative infrastructure must deliver green infrastructure integrated with grey infrastructure. It is critical that green infrastructure is considered beyond simply delivering screening

but to consider the wide range of ecosystem services it can deliver - from reducing flood risk, improving biodiversity and providing valuable green space for local residents. Large infrastructure projects are an opportunity to view local green infrastructure needs strategically as part of wider development needs.

It is vital that the means of securing these new sites is embedded in a legal framework. Options for this include voluntary but nonetheless legally and financially binding "Conservation Covenants", which have recently been the subject of a consultation by the Law Commission. These covenants can be undertaken between local authorities and private landowners, with a term of either perpetuity or a duration agreed between partners. For newly planted woodland to become established, develop a canopy and go through its first cycle of management, a minimum term of 50 years would be required. The recent A21 widening is a key example. The lack of a covenant has seen ancient woodland translocation works occur at the wrong time of year, with some translocation not occurring due to unexpected complications. The whole offsetting schemes was problematic with no financial commitment to mitigation, compensation or monitoring measures after the initial capital-funded 5 year period mentioned in the scheme proposals.

London's transport infrastructure

1. What are the major economic and social challenges facing London and its commuter hinterland over the next two to three decades?

The London commuter hinterland is predominantly designated as green belt. The green belt offers an exciting opportunity for environmental enhancements on the doorsteps of vast swathes of London's population. The green belt is coming under increasing development pressure, but the Trust would like to see its unique position close to both town and country capitalised on to make critical biodiversity links for wildlife as well as providing vital easily accessible greenspace for urban residents. In early discussions about the green belt, such as in an article by David Niven in 1910, emphasis was placed on the green belt being part of a park system with a focus on public access. With increased development occurring in the greenbelt it is critical that the remaining green belt is enhanced and the ecosystems services it provides capitalised upon. In 1914 in a speech to the London Society Aston Webb (architect of the Victoria and Albert Museum) said in his vision of London in 100 years time he saw 'a beautiful sylvan line practically all around London' with a certain amount of open spaces, pleasure grounds'. This is an opportunity to fulfil that vision and to create infrastructure and communities that are robust and resilient in the face of growing populations and climate change.

2. What are the strategic options for future investment in large-scale transport infrastructure improvements in London - on road, rail and underground - including, but not limited to Crossrail 2?

- *How should they be prioritised, taking account of their response to London's strategic transport challenges, including their impact on capacity, reliability, journey times and connectivity to jobs?*

- *What might their potential impact be on employment, productivity and housing supply in London and the southeast?*

No Comment.

3. *What opportunities are there to increase the benefits and reduce the costs of the proposed Crossrail 2 scheme?*

No Comment.

4. *What are the options for the funding, financing and delivery of large-scale transport infrastructure improvements in London, including Crossrail 2?*

- *What is an appropriate local and regional contribution - given the potential distribution of benefits to business, residents, transport users and the wider economy - and how could this be achieved?*

- *What innovative funding mechanisms could be considered to support delivery of key schemes?*

No Comment.

5. *How have major metropolitan areas in other countries responded to similar challenges and priorities? Are there any lessons to be learned and applied in London?*

No Comment.

Electricity interconnection and storage

1. *What changes may need to be made to the electricity market to ensure that supply and demand are balanced, whilst minimising cost to consumers, over the long-term?*

- *What role can changes to the market framework play to incentivise this outcome:*

- *Is there a need for an independent system operator (SO)? How could the incentives faced by the SO be set to minimise long-run balancing costs?*

- *Is there a need to further reform the “balancing market” and which market participants are responsible for imbalances?*

- *To what extent can demand-side management measures and embedded generation be used to increase the flexibility of the electricity system?*

No Comment.

2. *What are the barriers to the deployment of energy storage capacity?*

- *Are there specific market failures/barriers that prevent investment in energy storage that are not faced by other ‘balancing’ technologies? How might these be overcome?*

- *What is the most appropriate scale for future energy storage technologies in the UK? (i.e. transmission network scale, the distributed network or the domestic scale.)*

No Comment.

It is important that as the Commission consider electricity interconnection and storage, due consideration is given to future impacts on the natural environment. Ensuring that the delivery of all future provision takes in to account and works in harmony with our existing green infrastructure is vitally important.

The Woodland Trust has witnessed significant losses of irreplaceable ancient woods and trees across much of England due to the lack of consideration for impact on the natural environment. While new storage technologies and interconnection is something we do not object to, this must not come at the expense of irreplaceable habitats.

The Trust would also emphasise its support for the prioritisation of renewable sources and technologies in electricity provision.

3. What level of electricity interconnection is likely to be in the best interests of consumers?

•Is there a case for building interconnection out to a greater capacity or more rapidly than the current 'cap and floor' regime would allow beyond 2020? If so, why do you think the current arrangements are not sufficient to incentivise this investment?

•Are there specific market failures/barriers that prevent investment in electricity interconnection that are not faced by other 'balancing' technologies? How might these be overcome?

No Comment.

4. What can the UK learn from international best practice in terms of dealing with changes in energy technology when planning to balance supply and demand?

No Comment.