FUTURE OF FREIGHT

Call for Evidence Responses

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Contents

From: [Name redacted] [Email address redacted]
Sent: 26 January 2018 13:32
To: Freight Study
Subject: Freight Study and the Call for Evidence

- **What are the key constraints to the effective and efficient movement of freight in the UK and how do we overcome them?**
- Poor quality (verging on nonexistent) integrated East/West road and rail links. Look at a map of the UK – virtually all the main roads radiate out from London. But where are the motorways / railways linking our major container ports of Southampton, Tilbury, Felixstowe with the distribution heartland around Northampton and Milton Keynes? Why is the A47 http://www.a47alliance.co.uk/ not even fully dualled along its entire length from the energy and enterprise zones on the East Coast at Great Yarmouth and Lowestoft all the way to Peterborough, Leicester and Birmingham? This alone would unlock growth across many of the deprived communities in rural East Anglia and the Midlands. It would also take pressure off the A14 (which also needs upgrading along its entire length – not just around Cambridge) and many of the north south routes like the A1 and M1.
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- **How might the demand for freight develop and change over the next 20-30 years?**
- It will increase dramatically as more people work from home or on the move. They and the businesses they run will want Just-In-Time delivery to their 'door' wherever that happens to be on that day. That will require an integrated network of smart-systems managed primary distribution and secondary distribution hubs – probably served (in time) by semi-autonomous micro delivery vehicles for the final few miles.
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- **What effect does congestion have on the efficiency of freight movements and emissions?**
- Congestion is clearly costly for business in terms of delays to deliveries, hours of driver time, fuel wasted and deadlines missed. The environmental costs are also huge – adding to emissions. Better, faster, smoother roads reduce congestion and so are good for the environment and business.
-
- **How can freight reduce its carbon and air quality impacts?**
- Long haul freight should go by rail wherever possible. Where it has to go by road, the delivery lorries need to use smart engine management systems to regulate the driving so as to reduce stopping and starting – and reduce accidents.
-
- **How could new technologies increase the efficiency and productivity of UK freight?**
- Smart traffic and engine management systems could help improve fuel efficiency, reduce congestion (by encouraging drivers to keep a safe distance and to drive less aggressively). Smart warehousing will enable faster and more time precise deliveries to businesses and people.
-
- **What international experiences can the UK learn from to improve freight and reduce its carbon footprint**
- We should look at the improvements to road networks and the use of smart driver technologies and logistics management systems used in the major European distribution hubs in The Netherlands https://investinholland.com/business-operations/logistics-distribution/ and Germany – as well as projects in Sweden and Denmark.

Kind regards

[Name redacted]

Business Writers Limited

Registered in England and Wales
Co no. 8073409

T: [Telephone number redacted]
Skype: [Skype address redacted]
Li: **[LinkedIn address redacted]**
Twitter: **@Business_Write**

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Freight Study Call for Evidence

Submitted by Thomas H Zunder, Principal Research Associate and Freight Research Manager at Newcastle University

Profile: https://goo.gl/RhqN5Y

A major part of my role has been the development of visions of freight in the future, I was part of the team that wrote the Freightvision 30 years plan for the EU, the ERRAC 20 year freight research strategy, the Shift2Rail Multi Year Plan, and most recently the SETRIS 30 year roadmap for freight working with the technology platforms for logistics (ALICE), road (ERTRAC), and rail (ERRAC).

I submit this as my personal opinion based on over 15 years as a freight researcher and over 15 years as a line manager in the supply chain and manufacturing fields.

The single biggest change to freight in the next thirty years, ruling out a Black Swan event, will be the move to clean logistics, requiring new operational structures and triggering the move away from hydrocarbons.

The two primary drivers will be the need to avoid climate change and the need to improve air quality in cities. Substantial numbers of urban citizens across Europe are exposed to levels of NOX and PM above safe levels, and thousands of deaths can be attributed to air quality.

This will lead to a change in propulsion and a potential change in logistics operations.

Diesel is the primary fuel for freight in all modes. Road freight vehicles are the primary cause of NOX and PM emissions in cities - 40% of which is attributable to freight vehicles. Diesel vehicles are a significant and rising proportion of

GHG emissions . Whilst 18% of GHG emissions may be HGVs, it is the growth of LGVs that is both a threat and an opportunity.

In 1990, 15% of GHG was due to transport; by 2015 this was 23% (according to Eurostat). Within that however, freight is the smaller player, being only 10-15% of road traffic in a typical UK city. Of note is that DfT Transport Statistics show increasing registrations of LGVs, and their associated emissions, whereas HGV registrations and emissions have been flat for many years.

Alternatives to diesel differ by vehicle class. For lighter vans, fully electric options are now ready for market and available from, for example, IVECO and NISSAN. Battery monitoring, and integration with routing software, were proven within my Smartfusion project in Como, integrating with IVECO's new Daily range. Operational ranges of 120-160km are more than adequate for typical multi-drop operations in cities.

HGV vehicles are more likely to see a move to hybrid propulsion first, due to the weight of batteries needed to propel a vehicle over 25t. In Smartfusion I trialled a 26t hybrid vehicle in Berlin that combined a small battery, diesel generation, and a GPS system that switched to pure electric propulsion when the vehicle was in areas of air quality concern, preventing noxious emissions. Volvo recently launched this type of vehicle to market.

There is a crossover zone, from 3.5t GVW to 18t, where it is viable to build a fully electric vehicle. The Newcastle consolidation centre trials used a 12t vehicle from SMITH electric and they are now available from PANELTEX and TEVA, and increasingly exist on OEMs' design systems. If a step change is made in the energy density of batteries this zone will grow wider.

In rail, our team evaluated the option of freight locos moving to hybrid propulsion – and found it technically viable, but the carbon cost of replacing locos was unsustainable. In Europe, the number of diesel locos used for freight is small, and the environmental impact low, but the UK fleet is totally diesel, and may remain so, and here the emphasis has been to implement stop-start technology into locos. Based on current evidence, freight locos do not appear to impact air quality in cities.

Maritime freight will probably remain oil fuelled, but with many of the innovations in land transport migrating into ship design. Electric boats have been trialled and there are already electric ferries. The return of sails is quite probable. Fast boats exist bit have been found to be operationally non-viable. Autonomous barges will start to appear on large river systems but this is likely to not feature on UK rivers.

However, 30% of the cost of logistics lies in cities, where there is significant fragmentation, operational inefficiency, and empty running. Whilst logistics operators are inherently efficient, the overall system can be sub optimal. Attempts to impose top down solutions - such as city led consolidation centres - have failed, but in Smartfusion in Newcastle I developed an award winning public-sector procurement business model which is viable.

It is likely that soft infrastructure, such as collaborative ITS, will help deliver dynamic efficiency, crowd logistics, and autonomous delivery vehicles. The use of inference engines and big data may break planning and forecasting free of the need to count traffic to evaluate a situation.

One key infrastructure need will be to protect logistics facilities in the centre of cities, freight parks, railway sidings, canals - and at ground rents that the industry can afford. Logistics sprawl is a real problem. These facilities need to include the higher ampage charging points for commercial vehicles.

There is potentially a new boundary between long haul and urban last mile. How will the new technologies be supported by hard and soft infrastructures, and how will regulation and/or novel business models help? We shall see cities serviced by smaller, lighter, electric vehicles, but these are not vehicles for distance, and yet HGVs entering city centres will no longer be possible. This will require transhipment locations, which need planning and preserving. But it also opens up the opportunity to look at improving the efficiency and carbon impact of freight over distance.

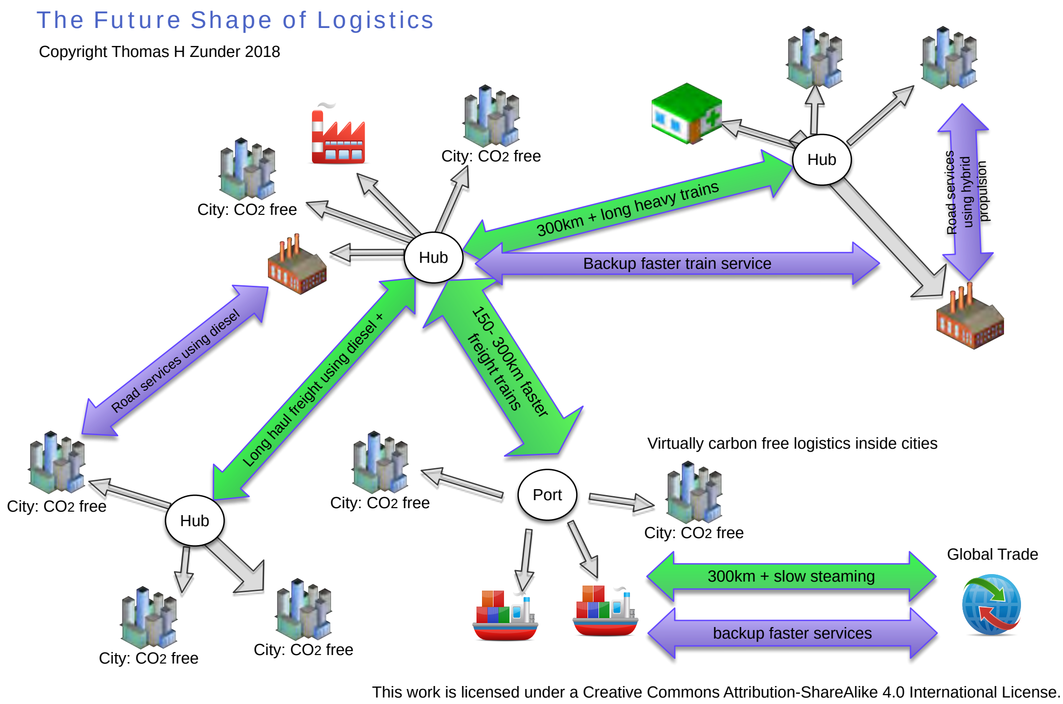


Figure 1: The Future of Logistics

Collaborative C-ITS on highways will enable close truck density with safe stopping distances and the implementation of ERTMS on the rail network would do the same, creating 'free' capacity on road and rail.

These trucks could be duel fuel, running off an electric catenary over the inside lane of the motorway, switching to diesel only when on the secondary network.

In summary, the twin drivers of climate change and bad air quality in cities will trigger the predicted move from hydrocarbons to electric propulsion, but we will still use hydrocarbons in inter urban movement unless we adopt a major new electric catenary infrastructure. Long haul and last mile distribution will separate more at the urban boundary. Urban freight will become low carbon, even zero carbon, and of great public interest: clean. The technologies of most efficacy will be propulsion and batteries, C-ITS and the exploitation of big data. The regulatory and operational innovations will be dynamic planning, crowd sourcing and public sector led procurement control of inbound logistics. Implementation of traffic control on rail and road can release significant capacity on arterial networks. Logistics parks and rail sidings need to be protected and available at lower ground rent in cities to prevent logistics sprawl.

Thomas H Zunder

This submission is my personal opinion and does not necessarily represents the opinions of Newcastle University.

National Infrastructure Commission Freight Study - Call for Evidence 2018

North Yorkshire County Council response

1. What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?

It is important that the National Infrastructure Commission Freight Study takes into consideration the constraints to freight movements in towns and rural areas including the 'places in between' the larger urban areas. North Yorkshire is at the geographical centre of the North of England and contributes to the economic prosperity of the North as well as having huge potential for future growth; however there are some constraints to growth relating to transport which also hinder the efficient movement of freight.

Resilience of transport routes is an issue – for example, flooding of key freight routes can result in routes being impassable and lead to road closures. An example of the need to ensure resilience of roads is the A59 in North Yorkshire which is a key strategic route between the towns of Harrogate and Skipton and one particular section of the road at Kex Gill is at a steep gradient and there is a landslip risk. The road has been closed on several occasions to traffic to undertake works, causing lengthy diversions which affect journey times and the efficient movement of freight. Consequently North Yorkshire County Council is working to develop a scheme to re-align the carriageway. This is one example of the importance of ensuring the resilience of key routes along the local road network which support freight movements. Central government investment

Journey time reliability is another key constraint that needs to be overcome. The A64 in North Yorkshire comprises a section of strategic route network between York and Scarborough and is a key East-West route that experiences significant congestion and issues of journey time reliability. Summer time holiday traffic (including caravans) can cause major delays as can agricultural vehicles. The County Council, with partners, has adopted an approach of identifying and developing proposals to increase overtaking opportunities on these roads through selective provision of dual carriageway and 2+1 single carriageway climbing lanes and overtaking lanes. This includes proposals for dual carriageway on the A64 between Malton and York and overtaking lanes on the A64 between Scarborough and Malton. The Local Enterprise Partnership and local businesses are extremely supportive of these proposals which would increase journey time reliability.

In terms of rail freight of growing importance will be the capacity constraints of the East Coast Mainline between Leeds and Newcastle especially for freight to Northallerton and onwards into Middlesbrough and Teesport.

1.1 What do you see as the key drivers to a successful freight system that is fit for the future?

It is vital to support freight movements by ensuring local highway authorities have sufficient funding to continue the maintenance of local roads to ensure safe, efficient routes between and within urban areas and key conurbations. Well maintained routes ensure better journey quality and higher satisfaction from businesses, including haulage companies.

Appropriate HGV routing is also important to try to reduce congestion, alleviate air quality issues, and avoid road blockages. One example of a pinch point in North Yorkshire is located on the A170 at Sutton Bank near Thirsk. This is one of the steepest sections of A road in the UK – with three steep 1:4 (25%) inclines and several hairpin bends – and it is hard to negotiate with a fully laden articulated goods vehicle, or where a driver is inexperienced or unfamiliar with the road. The route is used frequently by hauliers, including those transporting livestock and foodstuffs, and there are over 120 lorries stuck at this location each year requiring police assistance and causing the road to be blocked for many hours and leading to disruption to freight movements. There is signage alerting drivers to the hazard and North Yorkshire County Council, the Freight Transport Association and North Yorkshire Police provide driver information (see https://www.northyorks.gov.uk/road-obstructions-and-spillages for information), however drivers continue to use the route, including where satellite navigation systems are used incorrectly and direct drivers via Sutton Bank. There is a need for partnership working with freight operators and satellite navigation providers at a national level to ensure that everyone is able to access information about potentially problematic routes, including through real time traffic information.

We also suggest that consultation with operators is required to ensure the education system for a skilled workforce is appropriate for its industry – in particular ensuring that the workforce is able to meet the future needs of freight, and addressing driver shortages.

1.2 Which are the key freight corridors that matter the most? Where are the bottlenecks in the freight network, and what investments in upgrades could deliver the best value for money for freight efficiency and UK plc?

The North Yorkshire Strategic Transport Prospectus sets the strategic transport priorities for the county http://www.northyorks.gov.uk/article/32100/Strategic-transport-prospectus-2015 and highlights some of the transport problems that the County faces including poor links to the coast and across the Pennines. Improved sub-regional east – west routes situated between the M62 to the south and the A66 to the north would help to relieve some of the pressures on these routes by catering for more of the sub-regional traffic movements. There are also congestion pinch points within the main towns of North Yorkshire including Harrogate/Knaresborough and Scarborough which result in slow journey times in peak hours, and also local air quality issues.

North Yorkshire is a major source of raw materials, an industry which is heavily dependent on freight transport. There are large limestone quarries in the Yorkshire Dales National Park, gravel extraction in the A1(M) corridor, major areas of commercial timber extraction and the potential York Potash mine. The Freight Study should therefore consider key freight corridors in all parts of the country by recognising the need for freight to leave a start point (this may be a rural road in the case of transporting raw materials such as aggregate and timber from a quarry or forest) and reach an end destination which may also be along a local road. Sufficient funding should be provided to cover the maintenance of local roads to support freight movements.

The Freight Study should recognise that freight and logistics is not just about the strategic transport network and consider supporting local initiatives, such as North Yorkshire County Council's approach to addressing the issues of freight at its local origins and destination including through the highly acclaimed North Yorkshire Timber Freight Quality Partnership (more information at http://www.nypartnerships.org.uk/NYTFQP)

Investment is also required for supporting infrastructure for road freight – particularly to ensure there are adequate and safe freight parking and driver facilities along key freight corridors.

Rail Freight represents an effective way of moving large volumes of heavy goods and with a high percentage of the national rail freight travelling through North Yorkshire, the county's strategic railways are important to the industry. Recognising northern ports investment opportunities for additional freight to be transferred to rail should be examined including improvements to the network that improve speed of freight and new opportunities for new freight routes.

We support the aim to reduce end-to-end journey times for rail freight to offer a viable alternative to road haulage and in encouraging modal shift to rail. We note the use of the Immingham/Liverpool/Hull rail lines to transport Biomass from the ports to Drax Power Station, however there are very slow journey times. This is an example of the need to ensure reliable average speeds and would welcome early investment in this line (this is noted in the Transport for the North report). In addition to line speed Transpennine capacity is also important as there is a requirement for fast and efficient connections to East and West ports and increasing capacity for a commercially viable supply. This is especially important, given the national importance of Drax biomass for the Electricity Supply Industry and the need for energy safety and national power resilience.

1.3 To what extent are the economic benefits of freight factored into wider transport infrastructure investment planning?

North Yorkshire has a strong freight, logistics and distribution industry especially along the A1(M) and East Coast Mainline central corridor. North Yorkshire companies such as Reed Bordall at Boroughbridge, Alfred Hymas near Knaresborough, the Potter Group in Selby and Prestons of Potto near Northallerton are national players in the haulage and distribution industry operating over 500 vehicles between them. There are also major industrial estates specialising in warehousing and distribution most notably at Sherburn in Elmet near Selby which includes a major distribution depot for Eddie Stobart.

Given the above North Yorkshire County Council recognises the importance of freight to the local economy as outlined in the Plan to Deliver Economic Growth (2017) https://www.northyorks.gov.uk/sites/default/files/fileroot/About%20the%20council/Strategies,%20plans%20and%20policies/A%20Plan%20for%20Economic%20Growth%202017.pdf , and also the Local Transport Plan 2016-2045 https://www.northyorks.gov.uk/local-transport-plan and Strategic Transport Prospectus which sets out the Council's plans for transport infrastructure investment.

1.4 What are the regulatory and legal issues that, if changed, could improve freight efficiency without increasing costs or reducing efficiency?
No specific comments.

2. How might the demand for freight develop and change over the next 20-30 years?
North Yorkshire County Council is a member organisation of Transport for the North (TfN) and as such has had input into various studies conducted by the sub-national transport body. TfN has produced a number of freight studies forecasting future changes in freight in the North and highlighting the key issues in the region.

The following reports use detailed evidence and data (including using the GB Freight Model) as well as engagement with freight and logistics operators and industry experts to support the recommendations for ensuring the future efficiency of freight, including how the public sector might support freight:

Northern Freight and Logistics Report (2016)
https://www.transportforthenorth.com/wp-content/uploads/TfN-Freight-and-Logistics-Report.pdf

Northern Freight and Logistics Report (2016) - Technical Appendices
https://www.transportforthenorth.com/wp-content/uploads/TfN-Freight-and-Logistics-Report-Technical-Appendices-1.pdf

Enhanced Freight and Logistics Analysis Report – Strategic Transport Plan Evidence Base (January 2018)
https://transportforthenorth.com/wp-content/uploads/Freight-and-Logistics-Enhanced-Analysis-Report.pdf

The reports set out the key freight priorities for the North:
• Enhancing east-west connectivity;
• Enhancing north-south connectivity;
• Providing general capacity enhancements; and
• Improving intermodal connectivity.
They also note that: 'the Northern transport networks in their current state pose capacity problems and gaps in connectivity prevail that urgently require investment.'

2.1 How has the demand for freight, and types of freight, changed over the last two decades, and what will be the drivers for changes in the future?
See answer to 2.

2.2. How is the freight industry planning for future changes in the demand? What levers might be available to shape future demand for freight transport?
See answer to 2.

3. What effects does congestion have on the efficiency of freight movement and emissions?

Local pinch points can impact on efficiency of freight movements, particularly in urban areas. In North Yorkshire Harrogate/Knaresborough and Scarborough experience congestion particularly at peak times.

In North Yorkshire there are seven locations that experience poor air quality due to transport emissions which breach the nitrogen dioxide European Union objectives (and are therefore designated Air Quality Management Areas). The air quality is exacerbated by congestion and queuing traffic which increases emissions at these locations. North Yorkshire County Council, as local highway authority and with responsibility for public health has a duty to work with district councils to improve air quality, especially at Air Quality Management Areas. Local authorities are required to work together to investigate and implement actions to improve air quality. Often the transport emissions source apportionment exercises find that HGV emissions are a higher contributor to the air quality problem. Consequently local authorities may look to restrict freight movements at a particular location which could impact on the efficiency of freight movements; however this would only take place with significant consultation with local residents and businesses.

The Freight study should recognise that there is increasing pressure on from Government on local authorities to take action with regard to transport emissions, particularly following the recent case of Client Earth bringing successful litigation against the Government. The Government is now required to introduce new more stringent air quality action plans. This will have a resultant impact on local authorities who have a local air quality management duty, and may be required to find more radical ways to reduce emissions from transport – including the potential to effect freight routing/movements or even potentially exclude higher polluting vehicles from a location through implementing a Low Emission Zone. This would impact on the last stage of freight journeys when reaching an urban area. Policy implementation at the present time is fairly fragmented with different local areas taking a varied approach to the control of vehicle emissions and whether to implement Low Emission Zones. This could make it more difficult for freight operators who may favour a more stable investment environment where the regulations are the same across a particular region.

3.1 How does congestion impact upon the productivity and economic contribution of freight? To what extent does congestion affect changes to mode, time or other freight choices?
No specific comments – see section 3 above.

3.2 How does congestion affect the environmental impacts of the movement of freight?
See section 3 above.

We recognise the congestion and environmental benefits that moving freight by rail instead of road can achieve including a reduction in emissions from HGVs. A recent positive example in North Yorkshire is the reconnection of the Arcow and Dry Rigg quarries to the Settle to Carlisle railway at Horton in Ribblesdale in the Yorkshire Dales National Park. This project will help to remove more than 16,000 lorry journeys from the local road network each year particularly through the town of Settle. This example of moving aggregates, together with the transportation of timber from Ribblehead sidings in the Yorkshire Dales, demonstrates how rail transport can support primary sectors in rural counties.

3.3 With limited space for new infrastructure, how can we better use our existing urban network to support freight? Are there changes – such as changes to modes, methods, or delivery times - that could help reduce the stress on the urban transport network?

No specific comments.

4. How can freight lower its carbon and air quality impacts?

By ensuring fleets comprise environmentally friendly vehicles meeting the latest emissions standards and/or introduce new technologies including electric vehicles, alongside efficient routing to avoid congested areas/times and areas with air quality problems.

The local level Freight Quality Partnership approach may help where hauliers are operating on the local road network and for the last mile of deliveries, where local knowledge is required in terms of routing and timing of deliveries.

4.1. Are there efficiencies within freight management and distribution practices that could help reduce the CO_2 and NO_x emissions from freight?

No specific comment.

4.2 What role do alternative fuels such as electricity, Liquid Petroleum Gas and biofuels have to play? What are the barriers and challenges to wide-scale uptake of alternatives to diesel and what could be done to help remove these issues?

With the increase in online shopping and more parcels being delivered there are increasing numbers of delivery vehicles cars/vans on the road. Delivery drivers – who may be self-employed, on a low wage may not be able to purchase an electric vehicle. In addition many rural areas have limited electric charging infrastructure as most of the investment to date has been in urban areas. There is a need for Government to develop a strategy for implementing electric vehicle charging which supports freight, not just on the strategic road network but to also support the last mile of deliveries into towns within rural areas. More funding is required to increase the amount of EV charge points to support a shift to electric vehicles, particularly in rural areas, to support deliveries with lower carbon and air quality impacts.

4.3 What technologies could best and most realistically be utilised to manage the carbon impacts of freight, both within urban areas and on longer strategic journeys?

No specific comment.

5. How could new technologies be utilised to increase the efficiency and productivity of UK freight?

Automation (e.g. driverless technology) and Wi-Fi controlled vehicles could enable more freight to be carried at one time reducing the requirement for multiple trips. These technologies are likely to be more suited to the strategic transport network, therefore it is also important to identify technologies suitable for the local road network including the 'last mile'. Tracking systems could be used to monitor freight routing and times of deliveries to provide information for local Freight Quality Partnerships where partners work together to try to reduce the impact of freight on a local community.

5.1 How will new technologies change the capacity and performance of the freight transport network? Over what timeframes might these new technologies begin to affect the freight transport network?
No specific comment.

5.2 How can the use of data such as real-time traffic information by artificial intelligence and machine learning systems help to improve freight efficiency and productivity? How might this affect the business models and requirements of freight in the future? Are there any barriers to the greater use of data in freight?
No specific comment.

5.3 How do you see technologies such as HGV platooning, digital railway signalling, and autonomous vehicles being integrated into freight distribution?
No specific comment.

5.4 How might regulations and physical infrastructure need to adapt to new technologies and business models in the freight sector?
No specific comment.

6. Are there good examples internationally of freight systems, policy, infrastructure or technology development and implementation that the UK can learn from to increase freight efficiency and/or reduce the carbon and congestion impacts?
No specific comment.

National Infrastructure Commission: Freight Study Call for Evidence

Mineral Products Association (MPA) Response February 2018

Introduction
The Mineral Products Association (MPA) is the trade association for the aggregates, asphalt, cement, concrete, dimension stone, lime, mortar and silica sand industries. It has a growing membership of over 500 companies and is the sectoral voice for mineral products. MPA membership is made up of the vast majority of independent SME quarrying companies throughout the UK, as well as major national and international companies. It covers 100% of UK cement production, 90% of GB aggregates production, 95% of asphalt and over 70% of ready-mixed concrete and precast concrete production. Each year the industry supplies £20 billion worth of materials and services to the Economy and is the largest supplier for infrastructure construction and maintenance and to the construction industry in general. Industry production represents the largest materials flow in the UK economy and is also one of the largest manufacturing sectors. MPA members are significantly engaged in road, rail and water transport. For more information visit: www.mineralproducts.org

Mineral Products and Freight
The Mineral Products industry moves an average of one million tonnes of products daily. The largest element of supply is aggregates, whether extracted from the land, dredged from the seabed or recycled. Aggregates are used extensively in all types of construction work, including when incorporated in manufactured products such as asphalt, cement, concrete and mortar. In addition, 20 million tonnes of minerals such as limestone and silica sand are used for a wide variety of non-construction uses, including for the manufacture of iron and steel, glass, chemicals and pharmaceuticals and improving the productivity of agricultural land.

The industry operates around 2,000 extraction, recycling and manufacturing sites throughout the UK. The industry produces bulk materials and the ability to transport products efficiently to tens of thousands of customer locations is critical for both the industry and our customers.

Industry sales volumes fell substantially during the recession but have recovered strongly since 2012. The level of future demand will depend largely on the scale and timing of future construction work and notably the implementation of plans for infrastructure and housing investment. Looking beyond the short term, Oxford Economics currently forecast a 22% increase in annual construction value added between 2016 and 2030. MPA scenario planning has suggested a range of outcomes for future GB aggregates demand from a base of 220 million tonnes in 2015 to between 200 million tonnes and 268 million tonnes per year in 2030. While such data is subject to significant uncertainty they suggest that there will remain very significant transport demands for aggregates and other mineral products through and beyond the forecast period.

The characteristics of mineral products transport include:
- Annual transport of c. 350 million tonnes of materials and products by road, rail and water.
- Relatively short road delivery distances for aggregates (31 miles), asphalt (21 miles) and ready-mixed concrete (7 miles), with longer delivery distances for products with fewer production locations and / or higher value including cement, precast concrete, industrial lime and silica sand.

- Delivery loads for aggregates ranging from 22 tonnes (road), 1,500 tonnes (rail) and 5,000 tonnes (sea – dredger).
- Significant and increasing use of rail freight. Network Rail identifies 24.3 million tonnes of Construction freight carried in 2016/17, the great majority being aggregates.
- 12 million tonnes of sand and gravel aggregates dredged in UK waters are landed annually, the majority at wharves along the Thanes and Thames Estuary – although landings also take place elsewhere in Great Britain.
- In addition to being one of the largest sectoral users of road, rail and water transport, mineral products are extensively used in the improvement and maintenance of our transport infrastructure.

Questions included in the NIC Freight Study Call for Evidence

Q1. What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?

Q1.1 What do you see as the key drivers to a successful freight system that is fit for the future?

Key drivers for a successful freight system include:

- Ensuring that there is sufficient network capacity to accommodate freight transport and considering where it would be appropriate to give priority to freight transport over passenger transport.
- Making full use of rail and water transport to complement road freight.
- Ensuring that there is adequate investment in infrastructure improvement and maintenance. Consistent long-term planning and transparency of investment will help suppliers and users of the networks to plan more efficiently and innovate in their use of the networks.
- Ensure that local transport authorities have sufficient funding and resources to improve and maintain local transport networks. Most road freight is transported on local authority roads but there has been consistent underfunding of this network with the road maintenance backlog alone estimated at £12 billion.
- Ensure a policy focus on pragmatic solutions which improve the efficiency of freight networks. This should accommodate the opportunities available through technological innovation but also address practical and immediate issues such as those referred to in this document.

Q1.2 Which are the key freight corridors that matter the most? Where are the bottlenecks in the freight network, and what investments in upgrades could deliver the best value for money for freight efficiency and UK plc?

- As an industry delivering products throughout the UK from an extensive network of industry operations there is no simple identification of freight corridors which "matter the most" from a road transport perspective. There are persistent issues of road capacity constraints and difficulties in accessing customers in urban areas in particular which make efficient logistics difficult to achieve.
- For rail transport of mineral products there are a small number of key routes from supply sources to markets where targeted investment could have significant capacity implications.

Q1.4 What are the regulatory and legal issues that, if changed, could improve freight efficiency without increasing costs or reducing efficiency?

- For both rail and water transport an issue of increasing regulatory concern is the uncertain ability of regulatory systems to understand the freight transport implications of policy decisions. For example, the mineral products industry is able to make significant use of rail and water freight because there is a network of rail depots and wharves in and around urban centres which enable large deliveries of aggregates which are then split into smaller loads for onward road, rail and water delivery to construction customers. However, these sites can only continue to operate if they are safeguarded within the planning system. Currently the focus on housing development in urban areas is generating increasing pressure to develop industrial land which is currently used as wharves and rail depots for housing. If potential developments are allowed on or adjacent to such sites the industry's ability to make full use of rail and water transport will be compromised. To illustrate the issue, in London 97% of primary aggregates used in the capital are delivered by rail and water, some ten million tonnes per year. Each rail or water delivery prevented by additional land-use planning constraints would be the equivalent of 75 and 250 long distance lorry deliveries respectively. This is a current and national problem which has the potential to force significant volumes of aggregates back onto congested road networks and which can only be resolved of planning authorities recognise and implement policies which safeguard the operation of rail depots and wharves.

Q2.How might the demand for freight develop and change over the next 20-30 years?

Q2.1 How has the demand for freight, and types of freight, changed over the last two decades, and what will be the drivers for changes in the future?

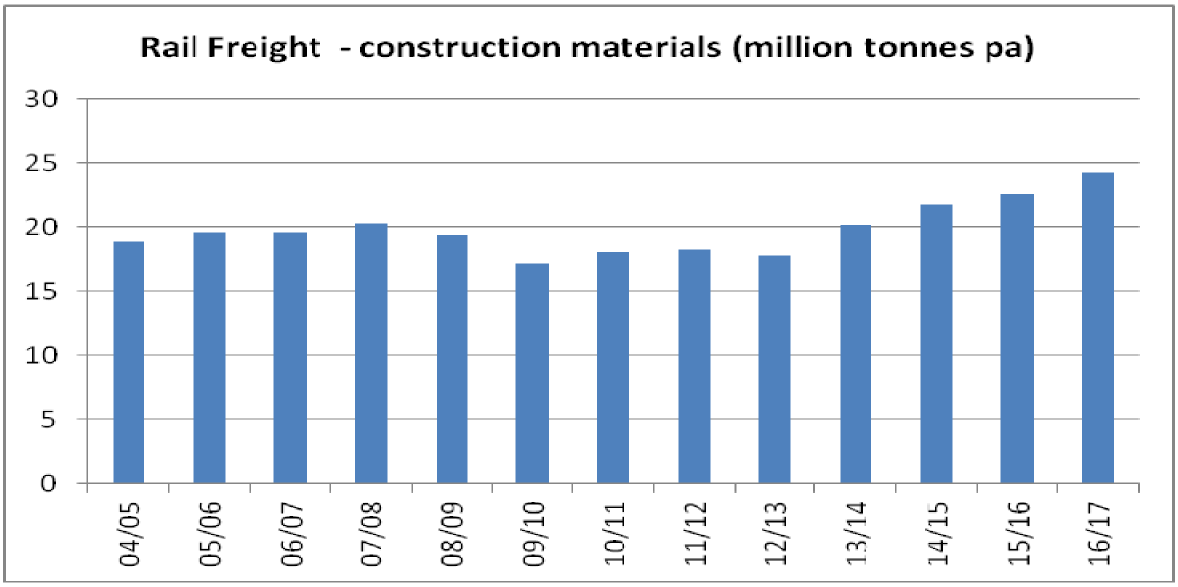
- Mineral Products Sales volumes fell substantially during the recession but have recovered strongly since 2012. The level of future demand for mineral products will depend largely on the scale and timing of construction work and notably the implementation of plans for infrastructure and housing investment. Looking beyond the short term, Oxford Economics currently forecasts a 22% increase in annual construction value-added between 2016 and 2030.
- MPA scenario planning has gererated a range of outcomes for future GB aggregates demand from a base of 220 million tonnes in 2015, as summarised in the following bullet points.
- *Demand projections suggest that by 2030, 267Mt per annum of aggregates might be needed to satisfy construction needs.*
- *Further declines in material intensity however could result in aggregates demand peaking at 220Mt per annum in 2023, before undergoing a steady decline to 200Mt per annum by 2030.*
- *Therefore the cumulative demand for aggregates until 2030 could be between 3.2 and 3.8 billion tonnes.*
- *While there appear to be sufficient indigenous mineral resources available to support future demand requirements, there are issues around the supply-mix that need to be addressed.*
- *Under all supply scenarios considered, significant tonnages of primary aggregates will be needed, supplying between 63% and 72% of overall demand, with recycled and secondary materials providing the balance.*
- *The decline in permitted reserves of land-won sand and gravel over the last 10 years points to growing reliance on other sources, particularly crushed rock and marine sand and gravel, to meet future demand.*
- *Alternative sources of aggregates, including recycling, secondary materials and imports, have a role to play but are unlikely to be a game changer given their constraints. The share of recycled and secondary aggregates varies between 28% and 37% of overall demand.*

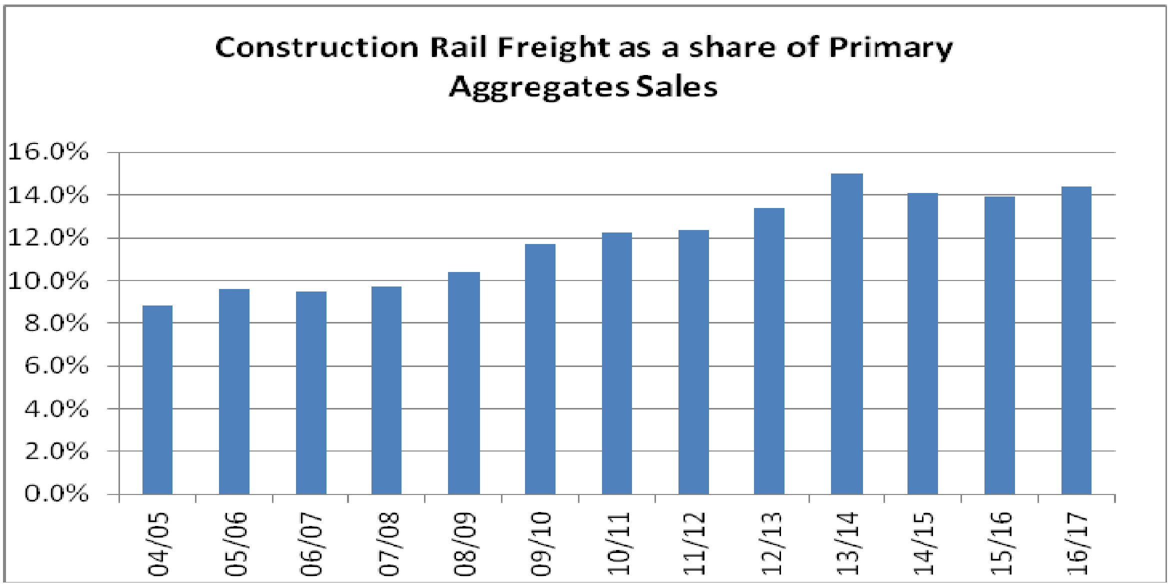
While such data is subject to significant uncertainty they suggest that there will remain very significant freight transport demands for aggregates and other mineral products through and beyond the forecast period.

Q2.2 how is the freight industry planning for future changes in demand? What levers might be available to shape future demand for freight transport?

As indicated in the response to Q2.1, there is likely to be a very significant level of future demand for mineral products and therefore significant transport demands. The future demands for freight transport will be influenced by factors including:

- The operation of the Mineral Planning System, which helps to determine where minerals are extracted. In recent years the amount of quarried sand and gravel aggregates sales which have been replaced by new extraction permissions has fallen so that over the past ten years only 60% of sand and gravel sales from GB quarries have been replaced by new planning permissions. One implication of this trend is that the availability of locally-sourced aggregates may diminish and the average road delivery distance for aggregates may increase beyond the current 31 mile average. If so road transport demand relative to the demand for industry products would increase.
- Industry access to rail depots and wharves. As set out in our response to Q1.4 there are growing concerns about whether the operation of the land use planning system will safeguard wharves and rail depots used by the industry. If the operational capacity of such sites is constrained by other forms of development there would be a significant transfer of freight demand to the road network. To illustrate the significance of rail freight to the industry the following charts show the growth of the rail freight of construction materials (mostly mineral products such as aggregates) and also the increase in rail freight of construction materials compared with the total GB market for primary aggregates.





- Increasing the average road load of mineral products deliveries could generate a significant reduction in the number of delivery vehicles on the road. The average road delivery load for aggregates of 22 tonnes reflects the fact that four-axle rigid tippers with a payload of c. 20 tonnes are the predominant industry delivery vehicle. If the use of articulated delivery vehicles with payloads of c. 30 tonnes was increased there would be a corresponding reduction in aggregates delivery vehicles on the road. There are some limits on the potential use of articulated vehicles such as the ability to deliver to construction sites with constrained access, but the use of articulated delivery vehicles is often limited by the perceptions of construction customers that these vehicles represent a safety risk. Such limitations can be reduced by improved site management of deliveries and also by the greater use of "walking floor" articulated delivery vehicles which can deliver higher payloads without the safety hazards which can be associated with tipping vehicles. A number of MPA members are investing significantly in these vehicles.

Q3 What effects does congestion have on the efficiency of freight movements and emissions?

Q3.1 How does congestion impact on the productivity and economic contribution of freight? To what extent does congestion affect changes to mode, time or other freight choices?

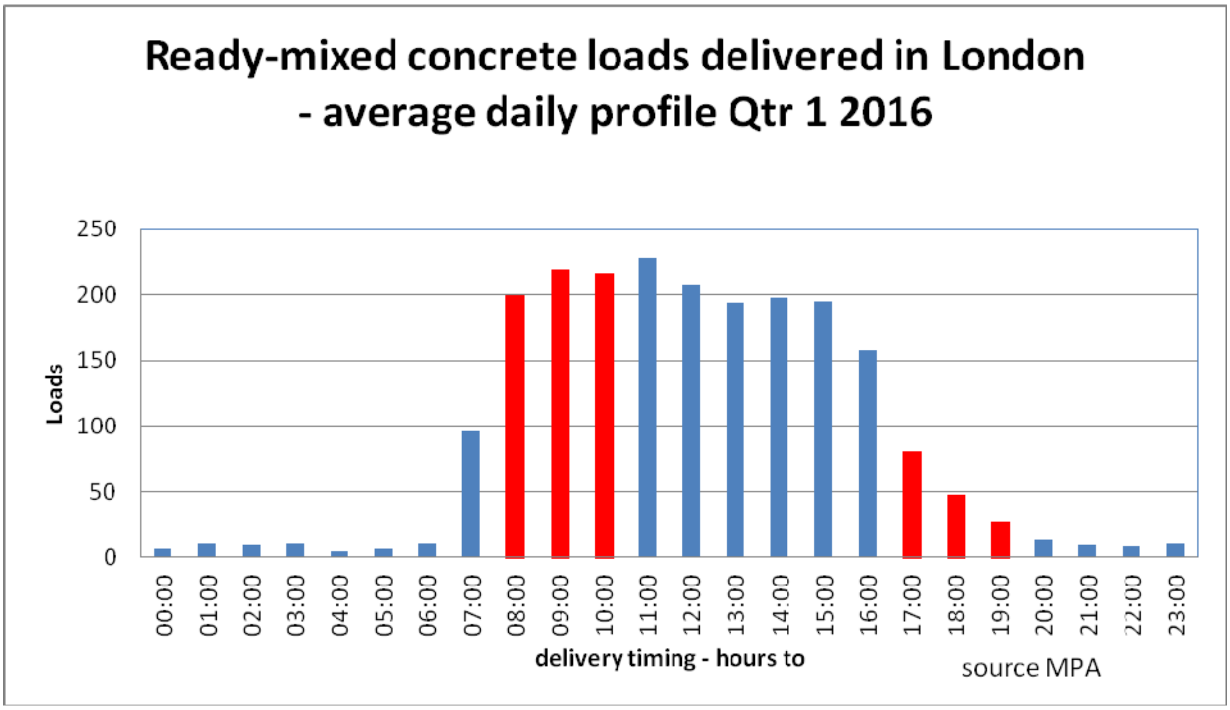
- Congestion reduces the efficiency of industry transport operations and also has the potential to impact on our customers including the progress of construction projects supplied by the industry. While such issues will be generic for freight operators the fact that our industry customers are operating construction and development sites ranging from major long-term infrastructure schemes to much shorter term projects, with a constant turnover of delivery sites creates particular logistical difficulties. Access and egress for temporary construction sites with limited storage capacity can be problematic and the sites are often working under tight planning restrictions, making the potential consequences of congestion delays very significant.
- The industry has developed a rail and water infrastructure to enable the delivery of large volumes of materials into urban areas and therefore reducing the potential for road congestion delays and costs, although the final delivery will generally be by road. As indicated in previous answers, further restrictions in the industry's ability to use rail and water delivery modes would add significantly to road freight traffic and

congestion. However, it should also be noted that there can also be significant delays to freight trains due to congestion on the rail network.

Q3.2 How does congestion affect the environmental impacts of the movement of freight?
Congestion will of course generate adverse environmental impacts, notably increasing fuel consumption and carbon and other emissions.

Q3.3 With limited space for new infrastructure how can we better use our existing urban network to support freight?
Key issues to address include:

- Maximise the use of non-road modes of freight transport. This is particularly critical for the delivery of bulk materials such as mineral products, where train and dredger loads are equivalent to 75 and 250 industry HGVs respectively.
- Ensure integrated and-use planning so that current and potential sites for rail depots and wharves are safeguarded effectively from competing developments and land uses.
- Make full use of the potential for out of hours deliveries and deliveries which are less concentrated in the morning rush hours. The chart below indicates the timing of deliveries of ready-mixed concrete from a large survey sample of producers to construction sites in London and illustrates the weighting of deliveries from 8.00 to 12.00. In many cases planning restrictions on the operation of the construction sites and sometimes of the concrete plants limits the flexibility of deliveries.



Q4 How can freight lower its carbon and air quality impacts?

Q4.1 Are there efficiencies within freight management and distribution practices that could help to reduce the CO2 and NOx emissions from freight?

There are a number of efficiencies to highlight including:

- Maximise the use of non-road modes of freight transport. This is particularly critical for the delivery of bulk materials such as mineral products, where train and dredger loads are equivalent to 75 and 250 industry HGVs respectively and the per tonne emissions substantially lower.
- Ensure integrated and-use planning so that current and potential sites for rail depots and wharves are safeguarded effectively from competing developments and land uses, therefore encouraging modal shift from road transport and lower emissions.
- Improve the fuel efficiency of the existing HGV fleet by encouraging drivers to undertake effective training in fuel efficient driving. The existing Driver Certificate of Professional Competence (DCPC) requires drivers to undertake five days of accredited training over five years. However, the effectiveness of this requirement is limited by the fact that there is no specific subject requirement for such training. If it was stipulated that the DCPC had to include key compulsory units, for example covering fuel-efficient driving (and also vulnerable road user safety), there would be the opportunity to reduce carbon emissions through a driver behavioural approach.
- Encourage the use more modern HGVs in urban areas in particular to minimise NOx emissions. To be effective such regulations require a reasonable period of notice to allow freight operators to comply and manage the cost implications of updating vehicle fleets. Financial support for freight operators to update fleets would speed up this process.
- Increase the average loading of delivery vehicles, notably by greater use of articulated HGVs, therefore reducing delivery vehicle numbers and associated emissions.

Q4.2 What role do alternative fuels… have to play?

Freight operators will move to alternative fuels when there is a commercial case for doing so, including vehicle availability and warranties, competitive running costs and the prospect of reasonable used vehicle prices.

To encourage earlier uptake of emerging technologies Government could consider opportunities for regulatory encouragement, for example permitting the use of higher gross vehicle weights and therefore payloads for appropriate vehicles.

Q5 How could new technologies be utilised to increase the efficiency and productivity of UK freight?

Q5.1 How will new technologies change the capacity and performance of the freight transport network? Over what timeframes might these new technologies begin to affect the freight transport network?

- New and evolving technologies such as the application of telematics have the potential to significantly improve the efficiencies of freight and logistics businesses and will no doubt continue to do so.

Q5.3 How do you see technologies such as HGV platooning, digital railway signalling and autonomous vehicles being integrated in the freight sector?

Clearly these technologies have the potential to significantly increase the efficiency of use of freight networks in the future and every effort should be made to explore and implement their full potential. We would however caution about such developments being regarded as a panacea for freight transport in the short and medium term. For example, while HGV platooning is under testing and development, its widespread future applicability to bulk road freight typical of the mineral products industry remains uncertain.

As such it will be critical for mineral products freight transport that the practical issues highlighted in this response are addressed and that freight and related policies address real world issues and constraints we can identify now and the sole policy focus is not just technologies for future application.

We recognise the significant potential productivity and other benefits which should result from the further implementation of technological developments. However, policies which address, for example, the need for sufficient and consistent investment in all transport infrastructure and the management of the land use planning system to safeguard freight transport operations, including rail depots and wharves, will also generate productivity benefits for our industry and the customers and sectors we supply throughout the UK.

NATIONAL INFRASTRUCTURE COMMISSION
FREIGHT STUDY: Call for Evidence
February 2018

1. The Associated Society of Locomotive Engineers and Firemen (ASLEF) is the UK's largest train driver's union representing approximately 20,000 members in train operating companies and freight companies as well as London Underground and light rail systems. The union has 1,825 members in the freight industry which is a quarter fewer than 16 months ago, because drivers have been pushed to retire, leave the industry or move to driving passenger services where they can expect better job security.

2. ASLEF welcomes this freight inquiry as an opportunity to make the case for more to be done to strengthen the rail freight sector. We were disappointed that the NIC's report '*Adonis: tackle the three Cs and deliver a world-class infrastructure*' undervalued the advantages of rail freight over road freight. We hope to convince the NIC and others that major investment in infrastructure and improvements to policy for the rail freight sector will be a cost-effective and efficient way of meeting the demand for convenient, fast delivery of goods without adding to road congestion, road accidents and air pollution.

1.1. What do you see as the key drivers to a successful freight system that is fit for the future?

3. We recognise that nationally the demand for the delivery of goods is growing but both our roads and rail network are under pressure from congestion. A successful freight system is capable of moving goods quickly, punctually and affordably without a detrimental effect on the environment. While we see rail freight as presenting many important advantages over other modes of transport for freight, we also recognise that rail freight will never provide a substitute for short distance trips in vans and small vehicles, for example. Rail freight is well positioned to transport heavy or unusual loads and it is able to move some items that lorries can't, such as steel which is loaded while still hot. However, looking at the bigger picture, the largest commodity group is now domestic intermodal which grew by 6% last year reaching 6.8 billion net tonne-km[1]. The best way of driving a successful freight system is to ensure that goods can be moved smoothly between transport carriers, with well-timed onward intermodal

[1] http://www.bettertransport.org.uk/blog/better-transport/government-must-support-rail-freight

connections. This will require investment in our infrastructure and measures to ensure that regulations are favourable (e.g. fair charges for rail freight operators and protection of land for freight yards and hubs, access to freight routes, etc) in order to build confidence in the industry among operators and their customers.

1.2. Which are the key freight corridors that matter the most? Where are the bottlenecks in the freight network, and what investments in upgrades could deliver the best value for money for freight efficiency and UK plc?

4. Until infrastructural capacity issues are addressed the rail freight industry is unlikely to invest. At the port in Immingham, our members see many new cars being unloaded from ships but none of the vehicles leave by rail because the rail network doesn't extend into the docks. Missed opportunities such as this, resulting from lack of infrastructure, are currently common across the country. We need major infrastructure projects to address the issue of rail hub access and to ensure that we have the interchanges necessary for freight to be transferred between transport modes. Rail freight is also constrained by the UK's Victorian infrastructure with tunnels, bridges and track that are not able to accommodate the vehicle weight and length required for trains to pass loaded with ISO shipping containers or double decks. Going forward, all investments in new infrastructure must work for the needs of the freight sector, to enable trains to significantly expand the volumes they carry. This means that vehicles with wider loading gauges need to be taken into consideration when upgrades are made to railway infrastructure. Experience has shown that targeted rail freight projects are worth investing in. For example, the gauge upgrades out of Southampton Port increased rail's market share from 29% to 36% within a year and had a benefit-cost ratio of 5 to 1[2].

5. Currently the vast majority of rail freight services do not travel at peak times and are often forced to use secondary lines in order to give access to passenger trains on the main lines. The way passenger services are prioritised over freight services is bad for business for freight operators, who need better scheduling and timetabling of freight paths to make them more efficient. Research[3] recently carried out for the Campaign for Better Transport (CBT) illustrates how infrastructure work to upgrade existing rail lines that run parallel to motorway routes would enable freight trains to run much more effectively and would allow large numbers of lorry loads to be transferred to rail, thereby easing congestion, improving air quality and reducing road collisions. The study looked at four of Britain's busiest freight routes (the A14 between Felixstowe and the Midlands, the A34 from Southampton to the Midlands, and the M6 and M62 motorways) which together carry around 37,500 HGVs every day and found that switching some freight to trains could mean fewer HGVs on the road, a 2.5% reduction in carbon emissions and 10%

[2] http://www.freightonrail.org.uk/ColumnJanuary2018.htm
[3] http://bettertransport.org.uk/sites/default/files/research-files/cross-modal-freight-study.pdf

less air pollution from NOx across the country. The 33 freight trains in and out of Felixstowe already remove around 2,500 lorries per day off the congested A14 corridor and, with funding, rail freight could be increased by 50% coming out of Southampton Port within the next five to seven years.

6. We are convinced that platooning would not work in the UK with our over-congested motorways. It would hamper cars, coaches and other trucks from seeing signage and would make changing lanes and joining / leaving roads difficult. Even at quiet times of the day or night, platoons would be split up whenever a truck slowed down to turn off at a junction. And unless all of the trucks in the platoon were the same model, were fully loaded with an equal weight, had the same power engine, and could accelerate at the same speed, they would not be able to stay together at an optimal speed for all of them[4]. An average freight train can remove 76 lorries from our roads[5] so this is, in our view, a better option by far.

1.3. To what extent are the economic benefits of freight factored into wider transport infrastructure investment planning?

7. ASLEF does not believe that the economic benefits of freight are factored into wider transport infrastructure investment planning adequately enough. Shippers and construction firms are crying out for more rail freight services but the ability to meet that demand is constrained by the rail network and the limitations on operator's access to paths. As mentioned above, tracks, overhead masts and bridges are not built taking into consideration the needs of rail freight and availability of track access is restricted and generally only possible at unsociable hours, working around passenger services.

8. Rail freight plays an important role in our economy: The Rail Delivery Group calculate that rail freight is worth £1.6 billion per year to the UK economy[6]. Rail freight serves markets as diverse as waste management and finished vehicles. Each year the rail freight industry carries goods worth over £30 billion ranging from high end whiskies and luxury cars to supermarket products, steel, cement and construction materials. Construction traffic grew 10% last year[7]. Network Rail say that rail freight is vital to Britain's economic success, and the UK rail freight sector contributes £299 million in profits and wages to the UK economy[8]. Rail operators pay for using the railway network, and public investment is repaid many times over through social and environmental benefits. Unfortunately we believe that Network Rail's estimate that rail freight volumes could double between 2006 and 2030 to over 50bn

[4] RAIL magazine 842, 20 December 2017
[5] Value and Importance of Rail Freight, Network Rail 2010
[6] https://www.raildeliverygroup.com/media-centre/press-releases/2015/183-2015-03-16.html
[7] http://www.freightonrail.org.uk/PDF/FoR%20Flyer%20Final.pdf
[8] http://www.networkrail.co.uk/aspx/10439.aspx

tonne-kms of freight moved[9] is extremely over-optimistic because this growth is based on an unconstrained network, which is not the reality at present.

9. Above we have already highlighted some of the current constraints and issues faced by rail freight operators that can make rail freight uncompetitive. Track access charging rates are another example of this, which we explore below. If a distance based lorry charging system were introduced, the system would be much fairer. If in addition to this a subsidy rewarding the social, environmental and economic benefits of rail freight were factored in to calculations for charges, in recognition of the fact that rail does not have the same impact as HGVs in terms of emissions, collisions, road infrastructure damage and congestion, it would make transporting freight by rail even more attractive and would hopefully influence transport infrastructure investment planning.

1.4. What are the regulatory and legal issues that, if changed, could improve freight efficiency without increasing costs or reducing efficiency?

10. ASLEF objects to any policies or regulations that put rail freight at a disadvantage or undermine freight access to the network in favour of passenger services. We believe that if the government were willing to act decisively to protect and grow freight on rail there are simple steps that could be taken that would be extremely effective.

11. Road freight is currently heavily subsidised and HGVs pay less than a third of the costs associated with their activities[10], making it difficult for rail to compete. Unlike lorry operators, rail freight operators pay separately for their use of the rail network and whereas access charges for rail operators have increased by more than 20% RPI since 2011, fuel duty for HGVs has been frozen over the same period. We believe that the government ought to recognise congestion, collisions, road damage and air pollution in any discussion about road costs. Lorries have a higher environmental, safety, congestion and road maintenance cost than cars but these costs are paid for by taxpayers. We also support the introduction of a distance based lorry charging system designed to reduce the number of HGVs unnecessarily on the roads with empty or only partially full loads. On the other hand, freight track access charges do not even take into account the social and environmental advantages of rail freight. If access subsidies were introduced as part of a green policy reflecting these wider economic and environmental impacts, it would improve rail freight's viability and encourage more freight to move from roads to rail. A comment recently made by DB Cargo to Network Rail illustrates the operator's

[9] MDS Transmodal road pricing freight June 2007
[10] http://www.bettertransport.org.uk/new-research-britain's-lorries-receiving-£5bn-annual-subsidy

frustration: "It is difficult to understand why freight operators as a whole have been allocated 13% of the total fixed costs when they only operate around 6% of the train miles"[11].

12. With devolution to sub-national authorities, ASLEF is also concerned that the interests of freight operators, who work across more than one Network Rail route, may be marginalised, and freight paths will need protection. Under the new system each geographical route is preparing its own strategic plan, and there will be separate plans for the freight and national passenger operator (FNPO) route, for the national system operator (NSO) and for Network Rail's central functions, but it is not clear whether a centralised operational structure will be retained. Nationwide freight services cross over regional boundaries but we do not know what the status of the FNPO will be, how it will be funded, whether it will have the authority over geographical routes to control nationwide access on key corridors, timetabling and possession planning, or how interfaces with other routes will be managed. Industry and its customers need answers to these questions and certainty over whether an extension on current access rights is a realistic possibility for freight train operators, if they are to seriously consider planning to commit to rail for the future movement of their goods and materials.

13. In terms of infrastructure, we have mentioned above that local authorities should be encouraged to support planning applications for large strategic interchanges, protect land sites for freight terminals with good access to roads, rail and major construction projects, and specify a percentage of construction materials to be moved by rail. Barnet Council, for example, recently approved building a modern rail freight terminal on existing rail lands at Cricklewood to service a housing regeneration project. Without the rail terminal, building between 7,000-8,000 apartments would not be viable but with the Cricklewood terminal each train will remove the need for up to 85 HGVs on the roads in what is a busy urban area[12].

14. We also urge the government to look at introducing clear directives and incentives to promote freight growth into TOCs' franchise contracts. If the requirement to do this were included in the regulations, it would make it more difficult to side-line rail freight.

15. The UK has signed up to legally binding climate change targets but simply professing to be in favour of cleaner, greener transport is not enough: Introducing regulations to force the industry to reduce emissions - by moving to rail freight, electrification and / or research into alternative fuels, for example - would be effective and would also be cost efficient in the long-term.

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[11] Loc+al Transport Today letter 05 January 2018

[12] http://www.bettertransport.org.uk/media/february/2018-cricklewood-rail-freight-terminal

16. Ultimately, the freight industry requires certainty for planning. Short term expansions and contractions risk bringing the rail freight into decline. This is why, as a union, ASLEF has argued that the government should explore nationalising the freight industry to create the stability that it needs to bring the full benefits it can offer to Britain, economically, socially and environmentally.

2. How might the demand for freight develop and change over the next 20-30 years?

17. Rail freight services are more exposed to the free market than franchise passenger services and have very tight margins. Coal and steel have long been the core business of the rail freight sector but the charge on trains carrying coal for electricity contributed to coal volumes falling at a much faster pace than had been anticipated. Recent decades have been reasonably successful for the industry but its failure to diversify into new markets sooner has left it vulnerable. Freight services carrying consumer goods to distribution centres, goods for export and stone from quarries have been forecast to grow but the downturn in coal and steel has left a shortfall which the traffic of consumer goods is only gradually able to fill. Network Rail's Freight Market Study projected annual growth in total rail freight volumes of about 3% per annum to 2043, with intermodal volumes forecast to increase by over 5% per annum and construction volumes forecast to grow by 1% per annum. However, we have noted above that this growth is based on an unconstrained network, and we therefore call the projections into question. It is ASLEF's view that the rising demand from new sectors with different requirements will put pressure on existing infrastructure capacity. Accommodating growth will only be possible if steps are taken to guarantee more rail freight capacity on key corridors and to ensure that growth is not hampered by congestion.

18. ASLEF fears that failure to protect the rail freight industry could have a very damaging effect on the railway system overall. Investing in infrastructure to develop trans-modal operations will be essential to improving freight connectivity. We need sites for freight terminals with good road and rail access so that our strategic interchanges are in the right locations for transhipment from rail connected hubs into low emissions vehicles. We would like to see strategic interchanges and rail connected hubs built with railheads close to infrastructure projects where practical. Also any infrastructure upgrades or enhancements should be designed to accommodate the length and weight of freight trains because failure to do this constrains the volume of freight that trains can carry.

19. At present it is unclear whether the freight and national passenger operator (FNPO) will be responsible for allocating access and timetabling connections, and whether access to freight paths will be guaranteed. This adds to the uncertainty around the future of freight and needs clarifying as soon as possible. Obviously the impact of closing lines to freight would damage the network's ability to meet

growing demands and would be an extremely short-sighted solution to current pressure of congestion on the lines.

20. The railway needs long term planning and the uncertainty around rail freight's future is currently resulting in difficulties recruiting for train drivers. Training drivers is a long process and, like acquiring infrastructure, decline cannot be quickly reversed. In Scotland freight has been in serious decline since the decline of the coal and steel industries, the closure of the Longannet power station and the depot at Hunterston. The number of rail freight drivers employed by DB Cargo in Scotland has decimated from 250 in the late nineties to just 40 today. In the last 18 months, the number of drivers employed by DB Cargo nationally has dropped from 1,118 to just 683. Other drivers are also considering retirement, leaving the industry or moving to passenger services where they expect better job security. With so many freight drivers leaving the industry, there is a risk that there could soon be too few drivers available to fulfil contracts when demand rises again.

21. Network Rail were unwilling to pay for the retention of train crew during non-engineering periods, meaning that there are now insufficient crew available to service big rail infrastructure upgrade projects on an adhoc basis. It must also be remembered that it is freight operators who carry out the essential ballast and infrastructure enhancement work on our rail network. Freight operators carry out the repair and maintenance of traction, rolling stock and infrastructure, without which TOCs would not be able to run any services. There are many rail infrastructure projects due to be undertaken in the coming years, much of which will be undertaken by freight operators but ASLEF is concerned that the industry is being allowed to decline too rapidly, which will threaten maintenance of the whole network.

3. **What effects does congestion have on the efficiency of freight movement and emissions?**

22. Road congestion is estimated to cost businesses £17 billion a year and its impact in terms of pollution, making streets unpleasant places to be and delaying public transport journeys affects local residents' health and stress levels. Shops and businesses need freight vehicles to make deliveries but having too many on the roads reduces efficiency by causing delays and blocking roads to unload. ASLEF agrees that transport strategies should include plans to achieve fuller freight vans and a reduction in freight traffic during peak hours, but we would also argue for a more concerted effort to shift to a cross modal system with more freight transported on the railways.

23. We have already voiced our scepticism about platooning above, and outlined the practical and logistical reasons for this. Scheduling delivery times at quiet times of the day may partially relieve congestion but does nothing to tackle the fact that HGVs are a hazard (HGVs are over 6 times more likely than cars to be involved in fatal collisions on minor roads and are involved in almost half of fatal collisions on

motorways even though they only account for around 12% of miles driven[13]) and are far more polluting than rail freight. Furthermore, empty running is now at 30% and load utilisation is also at the highest level for years so we support calls for a move to a distance based lorry charging system to incentivise more efficient HGV use of the road network, as well as making it fairer for rail freight to compete[14].

24. Rail freight already makes a major contribution to reducing road congestion in parts of the country which generate major flows of bulk traffic – such as the Mendips and the Peak District (for aggregates) and major ports. When the right infrastructure is in place, this is an extremely convenient way of delivering construction materials and remove waste. For example, an aggregates train can remove up to 136 HGVs[15] and each freight train can deliver enough materials to build 30 houses. In urban areas we encourage the development of cross modal consolidation and distribution centres capable of being rail served and from where goods can then be delivered by low emissions road vehicles including electric vans and e-bikes for light loads.

25. The UK has signed up to legally binding climate change targets and has a responsibility to take all measures possible to reduce air pollution. We know that rail freight currently enjoys considerable environmental advantages over road haulage: In 2014 HGVs contributed 17% of CO2 emissions despite making up only 5% of road vehicles, whereas both passenger and freight rail combined contributed less than 2%[16]. Rail freight creates 76% less carbon dioxide emissions, almost 90% less small particulate matter (PM10) and up to 17 times less nitrogen oxide emissions than the equivalent road journey[17]. And a tonne of goods can travel 246 miles by rail on a gallon of diesel, compared to only 88 miles by road[18]. Technological improvements will slowly improve the environmental performance of lorries, but overall rail will still be significantly 'greener' than road for the foreseeable future. The environmental benefits would have been even greater if the government had not decided to abandon plans to invest in electrification (in October 2009 it was estimated that 40 per cent of Britain's rail network was electrified and since 1997 only a further 60 more miles of track have been[19]). This was a short term money-saving solution but the investment in the infrastructure would have paid off. Electric trains are cleaner, greener, faster and more reliable than diesel operation. Electric traction virtually eliminates carbon monoxide and hydrocarbons and they can be powered by renewable sources of energy such as solar and wind power. Another benefit of electric trains is that they are lighter, cause less track wear and have longer operational lives, which reduces maintenance costs and means that they are more cost efficient. They have fewer moving parts meaning that maintenance of these trains is

[13] DfT Traffic statistics table TRA0104, Accident statistics Table RAS 30017 September 2014
[14] http://www.freightonrail.org.uk/ConsultationsDepartmentForTransportCallForEvidence.htm
[15] Network Rail Value of Freight 2013
[16] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/552492/rail-freight-strategy.pdf
[17] Value and Importance of Rail Freight, Network Rail 2010
[18] http://www.networkrail.co.uk/wp-content/uploads/2016/11/The-Value-and-Importance-of-rail-Freight-summary-report.pdf
[19] Commons Briefing paper SN05907, 27.07.17

simpler and cheaper, and energy consumption can be reduced using regenerative braking (slowing down trains can generate electricity which goes back into the network). The trains are also less noisy, which benefits people who live close to rail lines. Unfortunately, the government has reneged on many promises to invest in electrification and FOCs will not invest in electric until this decision is reversed and paths have been electrified nationally.

26. While ASLEF would welcome the introduction of alternative, sustainable, reliable and economic fuels but we do not see this as a realistic likelihood any time soon. It is not currently feasible to electrify HGVs because the batteries would weigh more than the payload of their load, and for trains we don't see hydrogen as an alternative because existing loading gauges limit tank carrying capacities. ASLEF would encourage investment into research for alternative fuels and would urge the government to provide operators with incentives to upgrade and modernise aging locomotives, but in the meantime we will continue to encourage the government to review its decision not to invest further in the electrification of our railways.

5. How could new technologies be utilised to increase the efficiency and productivity of UK freight?

27. The deployment of ERTMS (European Rail Traffic Management System) with the gradual installation of ETCS (European Train Control System) to provide in-cab instructions to train drivers, is considered to be particularly beneficial to freight drivers, who travel across the entire country, passing route boundaries and interacting with various types of train traffic and signals. upgrading the network's signalling on-train systems with this technology, which forms part of the country's Digital Railway Programme, can allow more trains to run on existing tracks and provide better connections. It can improve use of the network and provide greater flexibility in the timetable, but does not change the fact that ultimately, our network is at maximum capacity in many places and demand is growing.

Closing comments:

28. In conclusion rail freight offers many social and environmental benefits that make it a faster, greener, safer and more efficient way of transporting goods than roads. Although many political figures proclaim the clean, green virtues of rail freight, little has genuinely been done to promote growth. There needs to be a huge shift for change if this is to happen and we fear that we are still a long way from this. Meanwhile, the rail freight sector is in decline. It is ASLEF's view that the rail freight sector has been marginalised by passenger services and devolution could pose more of a threat if freight and national passenger operators (FNPOs) do not have enough authority to protect freight paths.

29. The decision to make short-term savings by downgrading plans to invest in electrification of lines was a shameful example of the transport secretary's short-term thinking. Investment in infrastructure has been inadequate and now we need major infrastructure projects to address the capacity constraints that prevent rail freight from growing to meet demand. All investment and new infrastructure should work for the weight and length of freight trains as well as passenger services. Rail hubs are required with the interchanges necessary for freight to be transferred between transport modes: This means sites for freight terminals with good road and rail access and cross modal consolidation and distribution centres capable of being rail served and from where goods can then be delivered by low emissions road vehicles including electric vans and e-bikes for light loads. We would like to see strategic interchanges and rail connected hubs built with railheads close to infrastructure projects where practical. The investment necessary to support growth in rail freight would be significant, but worthwhile, economically, socially and environmentally.

30. Failing this, the constraints and uncertainties around the future reliability of rail freight will increasingly push goods onto the roads and train drivers into other jobs. The current shortage of drivers following the redundancies last year cannot be quickly reversed when demand grows back, and if the industry is allowed to decline too rapidly, freight operators could struggle to undertake essential repair, maintenance and infrastructure enhancement work which would threaten the whole railway network. We hope that ASLEF's concerns and suggestions will be taken into account and would be happy to respond to any further questions the NIC may have.

[Name redacted]
[Job title redacted]
77 St John Street
London
EC1M 4NN

National Infrastructure Commission: Freight Study Call for Evidence

Written response submitted by
Heathrow Airport Limited

26 February 2018

Introduction

Heathrow Airport is pleased to have the opportunity to respond to the National Infrastructure Commissions Freight Study Call for Evidence. This document focuses on air-freight as opposed to general freight required for the running of the airport (for example, retail supplies and construction logistics).

Since 1946, Heathrow has been connecting people from around the globe, making it one of the world's busiest international airports. Heathrow is the UK's biggest port by value of goods and last year over 1.6 million tonnes of air-freight passed through the airport – worth more than £106 billion in value. Heathrow is the global gateway to London and the United Kingdom with approximately 75 million passengers also passing through the airport in 2016. It is a driver of jobs and growth, and a focal point for other high performing industries such as pharmaceuticals, IT, and research and development. The expansion of Heathrow will deliver benefits across the UK and is a key strategic element of the Government's modern industrial strategy.

Air-freight is integral to the business models of many airlines that currently operate at Heathrow or have plans to operate at an expanded Heathrow. This is because many of the full-service or legacy carriers rely on air-freight and these carriers' commercial considerations in starting-up or continuing a new route depend to some extent on air-freight. For example, a route that is not profitable all year round on passengers alone can capitalise on the peak air-freight demand during winter to make it commercially viable.

Analysis by Heathrow in 2017 identified 13 long-haul routes that were only viable because of the revenue airlines received from what was carried in the belly-hold. Additionally, another 29 routes were identified as highly reliant on air-freight. In some cases, air-freight revenue for airlines can be equivalent to that received from 100 economy class passengers – so air-freight is vital to Heathrow's route network. If Government wishes to generate the greatest connectivity benefit from Heathrow's expansion then a competitive air-freight sector is essential, particularly in a post-Brexit environment

Air-freight is also vital for the UK economy. It enables the import and export of goods that would not otherwise be possible to trade. Time-sensitive and high-value goods use aviation because of the speed, reach and security provided by aviation. This includes products as varied as Scottish salmon, books, pharmaceuticals and fast fashion. Any interruption in the flow of these goods could result in value loss.

It is important the UK Government ensures exporters, importers, businesses and freight forwarders can continue to trade without disruption during the Brexit process by providing early certainty and agreeing a transition deal that maintains today's arrangements for an agreed period. Importantly, the Government should also ensure the UK continues to be an attractive place to trade with and hub through by ensuring frictionless trade.

Heathrow is unique among UK airports in combining large quantities of air-freight with passengers on normal passenger flights. Heathrow would be grateful for the opportunity to work closely with the Department for Transport (DfT) on how the Aviation Strategy supports the air-freight sector and delivers incentives for capital investment in air-freight facilities.

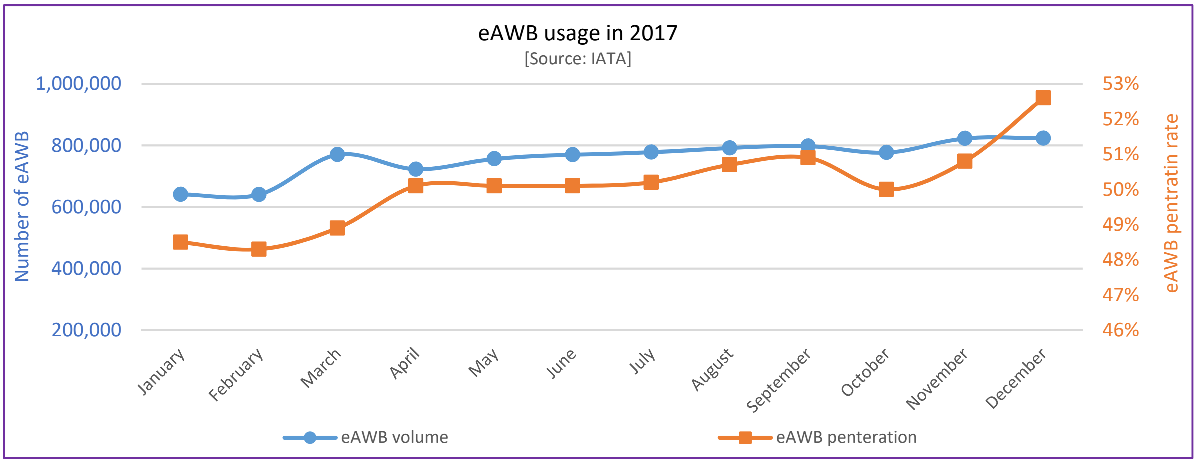
Questions

1. What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?

1.1. What do you see as the key drivers to a successful freight system that is fit for the future?

An effective and efficient air-freight system requires a highly predictable, right-in-time movement of goods to, through, and from the airport. One of the key benefits of air-freight is speed, for which customers are willing to pay a premium over other transport modes. Logistics providers that offer streamlined services - such as the fast-parcel operators (for example DHL, FedEx/TNT and UPS) - are the ultimate example of effective and efficient service providers.

The air-freight industry has been very slow at adopting technology over the last 20 years and is heavily reliant on paper-based, manual processes. The airlines' association – IATA – has worked hard over that time to have electronic air-waybills (eAWB) adopted broadly and in 2017 the industry achieved an average 50% of its members' air-waybills being in an electronic form. With still only 49 airlines reporting on eAWB usage in December 2017 out of a membership of 240 airlines, the challenge is clear.



Adoption of technology and redefining working practices to capitalise on its benefits are crucial to an effective and efficient air-freight system. The industry is highly competitive; however, this has not led to widespread innovation, with the cost of implementation and complexity of global jurisdictions cited as barriers to success.

1.2. Which are the key freight corridors that matter the most?

Port (London Heathrow)	Export to		Import from		Trade with	
Heathrow's Top-5 trade lanes in 2016	Value (£m)	Net mass (tonnes)	Value (£m)	Net mass (tonnes)	Value (£m)	Net mass (tonnes)
United States	14,177	90,133	17,572	122,630	31,749	212,763
China	3,064	34,740	4,821	106,925	7,886	141,665
India	1,235	14,517	1,016	41,192	2,251	55,708
Hong Kong	4,491	14,304	5,999	36,852	10,490	51,155
Japan	1,923	12,406	3,563	14,200	5,486	26,606

Source: UK Tradeinfo, 2016 (https://www.uktradeinfo.com/Statistics/BuildYourOwnTables/Pages/Table.aspx(; Heathrow analysis

Port (London Heathrow)	Trade in 2010		Trade in 2016		CAGR	
Heathrow's fastest growing trade lanes (2010-2016)	Value (£,000)	Net mass (kg)	Value (£,000)	Net mass (kg)	Value	Net mass
Honduras	1,486,552	41,918	7,142,334	1,366,898	30%	79%
Aruba	633,431	3,244	263,778	51,089	-14%	58%
Gambia	1,944,083	58,821	2,727,083	644,750	6%	49%
Ceuta	211,258	743	231,717	7,181	2%	46%
Burma	2,114,847	38,967	11,535,518	365,110	33%	45%
Source: UK Tradeinfo (https://www.uktradeinfo.com/Statistics/BuildYourOwnTables/Pages/Table.aspx(; Heathrow analysis. Excludes countries with no trade through Heathrow in 2010						

1.4. What are the regulatory and legal issues that, if changed, could improve freight efficiency without increasing costs or reducing efficiency?

Cargo rescreening:

Under current DfT rules, all air-freight arriving on a vehicle from mainland Europe must be security screened again, despite already having been security screened before loading and secured by tamper evident means. At the same time, if that same air-freight had arrived on an aircraft, it would not require security screening again. Removing this requirement would reduce industry costs and substantially reduce handling times making the UK much more competitive against other European hubs.

Load consolidation:

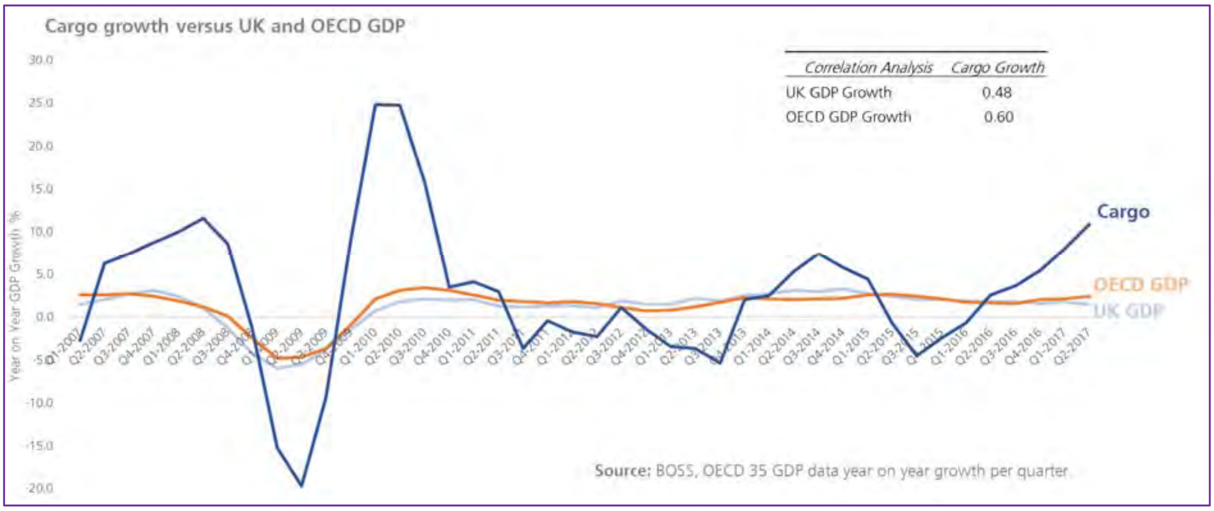
Under current HMRC rules, logistics providers are unable to load differently classified air-freight on to the same vehicle – for example imports cannot be carried with exports on the same vehicle. The result is additional vehicles coming to Heathrow with less-than-full loads (LTL) meaning they cannot be optimised. Logistics providers either send two vehicles – one to deliver exports and a second to collect imports – or they travel around Heathrow's Cargo Estate twice – the first time to deliver exports to different handling companies then once completed, revisit the same companies to collect imports.

Electronic forms:

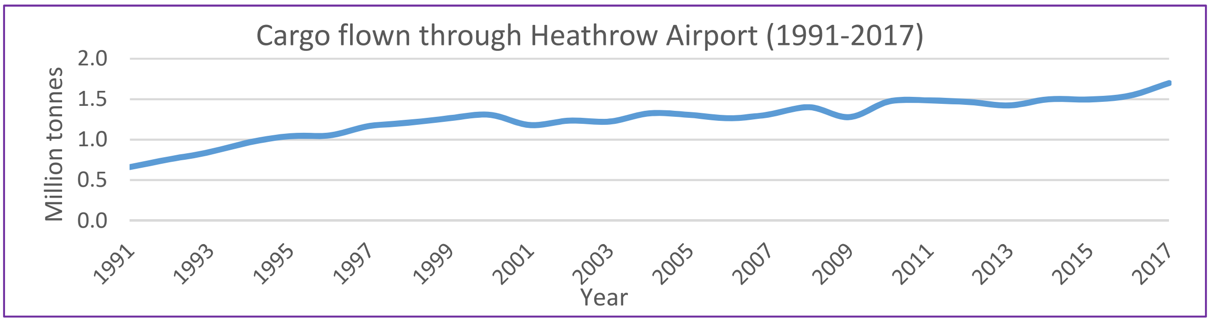
The low uptake in electronic forms creates significant inefficiencies, unnecessary vehicle movements and consumes a considerable quantity of paper which subsequently needs to be archived somewhere. Requiring all transactions to be electronic could provide the Government with richer insights and greater visibility on freight make-up whilst at the same time reducing the impact on the local environment and reducing industry costs. With up to 23 different forms currently travelling with a consignment, there is technology available today to move this information electronically. However, this will require a change in UK customs regulations.

2. How might the demand for freight develop and change over the next 20-30 years?

Given the uncertainty around future trading relationships post-2019, it is difficult to predict growth over that timescale. However, there has been reasonable correlation between OECD GDP growth and the volume of cargo flown through Heathrow. The Commission may wish to consider this as a reasonable indicator.



The volume of cargo flying via Heathrow has grown at a compound annual growth rate (CAGR) of 3.8% since 2001 and at a CAGR of 4.1% since 2009.



2.1. How has the demand for freight, and types of freight, changed over the last two decades, and what will be the drivers for changes in the future?

The growth in e-commerce and specialist cargo such as pharmaceuticals has far exceeded the background growth in general cargo, however one needs all types of freight for routes to be viable. Whilst the global financial crisis showed some manufacturers they could move their products by ocean and still meet their customers' expectations, the core attributes of air-cargo (speed, reach and security) means that air-cargo will continue to grow.

4. How can freight lower its carbon and air quality impacts?

As a part of efforts to reduce its environmental effects, Heathrow recently launched its ten-step 'Blueprint for Sustainable Freight', aimed at reducing the effects of freight around Heathrow. Heathrow is the UK's biggest port by value, handling over 30 per cent of the country's non-EU exports by value. With expansion, Heathrow's role as a trading hub will grow, with cargo capacity set to double with the addition of a third runway.

Heathrow's Blueprint for Sustainable Freight shows how it can reduce the environmental effects of air-freight operations by improving efficiency and limiting the effects of air-freight related vehicles, with the overall goal of ensuring airport-related traffic on the roads does not increase compared with today.

The Blueprint outlines ten practical steps to make air-freight operations more efficient, responsible and sustainable:

- Heathrow will launch an online load consolidation tool, allowing freight companies to share information about spare vehicle capacity or ask for assistance with transporting a load. The online tool will match up companies, allowing them to co-ordinate their operations.

- Heathrow will help its partners deliver a modern cargo village, allowing more direct trips to the airport, and allowing for more air-freight to be processed on site.

- Heathrow will begin consulting on its plans to install airside transhipment points, streamlining air-to-air processes and reducing the number of vehicles operating on the airport.

- Heathrow will consult on building off-site consolidation centres to reduce the number of air-freight related vehicles coming to the airport.

- Heathrow will consult on the introduction of a local code of conduct for all Heathrow freight operators, focusing on behaviours that affect the local community.

- Heathrow will work with local highway authorities and boroughs to ensure a consistent approach to the way freight activity is enforced.

- As part of a co-ordinated approach with local authorities, Heathrow will identify appropriate locations for freight facilities to try and avoid inappropriate traffic movements close to residential areas.

- Heathrow will establish a Sustainable Freight Group to exchange experience and best practice, support the development of initiatives to reduce emissions from freight activity at the airport, and feed into local and national freight policy development.

- In the leadup to expansion, Heathrow will look to trial the use of low-emission freight vehicles and geo-fencing technology to encourage use of electric vehicles at Heathrow.

- To further encourage companies operating on the airfield to make their fleets more sustainable, in 2025 Heathrow proposes to introduce airside vehicle emissions standards in line with London's Ultra-Low Emissions Zone. This will allow Heathrow to control airside access and tie airside vehicle permits to the age and emission standards of freight and other airside vehicles and eliminate the use of the most polluting vehicles.

4.1. Are there inefficiencies within freight management and distribution practices could help reduce the CO_2 and NO_x emissions from freight.

Current government policy in relation to movement of bonded goods by road is adding a significant amount of vehicle journeys with very low utilisation. Anecdotal evidence from logistics providers and customs facility operators is that HGV frequently arrive to deliver less than ½ tonne of air-cargo. HMRC's rule that vehicles cannot carry import and export freight simultaneously to multiple locations prevents logistics providers from optimising their fleet utilisation and consolidating the number of vehicles coming to Heathrow. Heathrow strongly supports industry in using technology to inform HMRC on the status and location of bonded goods and leaving it to industry to optimise the movement of those goods – it would reduce the number of vehicles and $CO_2$and NO_x emissions.

Given the rise in e-commerce and the increasing compliance costs associated with operating fleets of HGV, transport providers are shifting to vans for moving air-cargo to/from the airport. The increase in these types of vehicles could be beneficial were they to be switched to cleaner fuels. Although the development of electric HGV has been slow and complex, electric van size vehicles are already available. Whilst the additional number of vehicles could be problematic, they should be a lower source of emissions than maintaining a smaller fleet of diesel-fuelled HGV.

6. Are there good examples internationally of freight systems, policy, infrastructure or technology development and implementation that the UK can learn from to increase freight efficiency and/or reduce the carbon and congestion impacts?

In the European context, Amsterdam's Schiphol Airport is considered to be the benchmark. Schiphol has successfully introduced data sharing and efficient working practices to optimise the logistics chain, reduce the environmental impact and provide high quality service to their customers. Shared data platforms like Cargonaut allow the community to collaborate. Shared logistics under their "Milkrun Project" between the airport sheds (ITSF) and off-airport bonded warehouses (ETSF) means less vehicles on the road. Schiphol also benefits from a whole-of-government approach to supporting the air-cargo industry – from local authorities through to national government, policies are adopted that speed up the flow of goods, reduce waste and keep their borders secure.

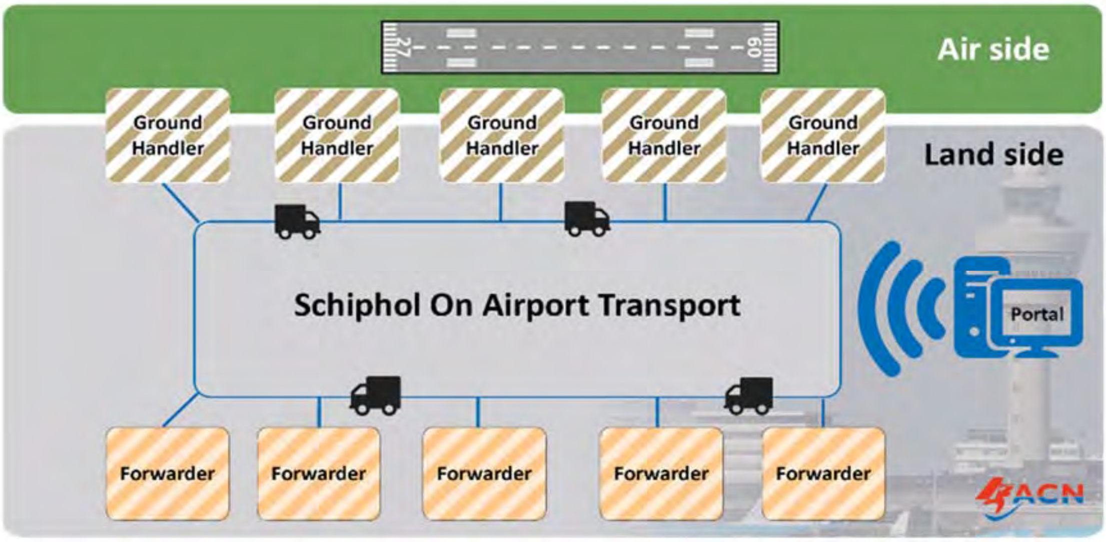


Figure: AMS/Air Cargo Netherland's Milkrun Project http://www.acn.nl/milkrun/milkrun-concept/?lang=en

Future of UK's Freight infrastructure
National Infrastructure Commission Call for Evidence

Port of Dover Submission

The Port of Dover is pleased to make its submission to the above call for evidence, which is timely as the issue of maintaining traffic and trade fluidity at this critical time between the UK and its largest and nearest trading partner – the EU – is relevant to not only the Port itself but also the strategic roads feeding it. The port infrastructure and that supporting it is fundamental to the ongoing success of the UK as a trading nation and the efficient movement of freight.

The Port of Dover provides the shortest crossing point between the UK and mainland Europe and has evolved over the past 60+ years to cater for high-speed just-in-time pan-European supply-chain movements. Today, it handles up to £122 billion of trade or 17% of the UK's trade in physical goods by value. Along with its neighbour, Eurotunnel, the cross-Channel corridor caters for almost one third of the UK's trade in goods.

Dover handles 2.6 million freight vehicles and has experienced freight growth of 33% in just the last five years. After Article 50 was triggered by the UK in 2016, Dover recorded another record year for freight volumes. After the EU agreed to move on to Phase 2 of the Brexit negotiations at the end of 2017, Dover recorded yet another record freight year. Dover and is sister ports of Calais and Dunkirk provide pan-European supply chains with the most efficient route to market. Together with Eurotunnel, we ensure that shops have food, flowers, drinks, drugs and many other goods when people want or need them; they ensure that car manufacturers operating across Europe have the components needed on the assembly line at just the right time.

In Dover's example, it can do this because it can operate 120 ferry movements each and every day on the shortest crossing. It can berth, re-load and depart a ferry in 45-50 minutes and turn over its land space 5-6 times per day in order to handle up to 180km of freight vehicles – or a queue of trucks from Dover to Stansted airport in Essex.

With around half of the UK's imports and exports being with the EU and together with the type and volume of goods handled at Dover, there is no substitutable capacity anywhere else in the UK that can take this essential road-based freight traffic.

The Port itself has been delivering major investments including the opening of a 4km freight buffer zone in the Eastern Docks ferry terminal in December 2015 as part of an £85 million capital investment programme to upgrade the Eastern Docks. Currently, the Port is delivering a £250 million development in its Western Docks, the Dover Western Docks Revival scheme, which by moving its general cargo operation out of the Eastern Docks will create a dedicated ferry terminal in the Eastern Docks whilst delivering a new cargo and logistics operation in the Western Docks. This is the Port's biggest ever single investment and enables the opportunity for a second buffer zone in the Eastern Docks capable of holding a further 6km of freight.

The Port's own investments are an essential component for the efficient and resilient operation of the Port and its significant contribution to keeping the nation's trade moving whilst minimising the impact on the local community both now and into the future. However, the success of this contribution is reliant on optimising the strategic road network. Insufficient capacity within the strategic network has the ability to impede traffic flows to the Port and reduce its efficiency.

Highways England has therefore rightly identified that the strategic road network (SRN) should provide reliable and resilient access to international gateways. It also acknowledges that more than three quarters of imports and exports leave and arrive at these international gateways by road.

As the UK's busiest roll-on roll-off ferry port, Dover's road access requirements are particularly acute with much of the current focus being on potential Operation Stack options from a Brexit contingency perspective.

The Port is delighted with the progress that has been made regarding the Lower Thames Crossing and its prioritisation for road period 2020-25. With half of the Port's road-based freight traffic heading beyond London to support economic activity in the Midlands and North of England, this is a critical investment to ensure fluid freight flows between these economic centres and Europe.

The Port receives freight from all over the country with direct access via the M20/A20 and M2/A2, both being viable routes from the M25. These routes converge in Dover. However, the Port is served primarily by the M20/A20, a three-lane motorway/dual carriageway road used by between 60% and 70% of freight vehicles heading to the Port. This consistent bias is due to the higher standard and capacity of the A20/M20. However at times of incident on the M20 or whilst Operation Stack is in force, freight vehicles quickly re-route to the A2/M2 corridor in an attempt to minimise disruption to their journey. This is a predictable response by lorry drivers, as it would be for any motorist in response to knowledge of network stress elsewhere, and was witnessed during the instances of Operation Stack during 2015.

When traffic does divert to the M2/A2 route, it experiences an inadequate alternative due to the inconsistencies of lane provision ranging from four lanes to the north to merely single carriageway for 5.5km between Lydden and Whitfield and then a further final section including Jubilee Way to Dover and the Port.

Therefore, improved resilience in the SRN through the enhancement of the alternative A2/M2 route would provide a better diversionary route during times of disruption. Dualling of sections of the A2 on approach to Dover and around Lydden to motorway or expressway standards is needed as well as junction enhancements with the M2 at Junction 7 Brenley Corner.

In order to accommodate increased local and strategic requirements and support the growth ambitions of the north west of the county, addressing the dualling of the A2 is paramount. The realisation of a new Lower Thames Crossing will provide a strategic economic benefit to the UK and to the movement of international traffic and trade. The preferred route will improve the north-south movement of trade from Dover and the other Channel ports (including Eurotunnel) to destinations north of London.

It will therefore provide additional resilience on the strategic network for much of the international traffic heading to/from the north of the UK to/from Dover/Eurotunnel which helps to maintain an effective international route for freight between the Midlands/North/Scotland and mainland Europe.

However, a new Lower Thames Crossing is likely to encourage greater usage of the M2/A2 and will focus further attention on the need for every link in the strategic transport chain along this route to be strong. WSP Consultants have reviewed the transport data for the Lower Thames Crossing and this suggests a circa 9% migration to the M2/A2 route. As such, this strategic consideration adds more emphasis on the need to dual the remaining single carriageway sections of the A2 between Lydden and Dover.

At times of high demand, traffic destined for the Port often queues along the A2 approach. Under these conditions, because there is intermittently only single lane capacity as far back as Whitfield and beyond, local traffic can be directly impeded by Port-bound traffic with no ability to bypass queues. If there was a consistent two-lane road between these points, with suitable traffic management, it would enable the impact of queuing Port traffic on local traffic to be minimised.

The benefits of this traffic management approach have successfully been demonstrated by Dover TAP (Traffic Assessment Project) on the A20. Since its introduction in 2015, Dover TAP has been implemented over 310 times, achieving the strategic aim of reducing congestion though the town of Dover safely and efficiently, whilst maintaining fluidity of freight traffic to the Port. Dover TAP has successfully enabled the use of a rolling road approach for queuing freight vehicles whilst keeping car and non-Port freight traffic flowing freely. This has recently been further enhanced by the introduction of an automated variable speed limit to optimise traffic flows at all times.

If there were to be a second TAP on the A2 coupled with its dualling, added to capacity enhancements (achieved and planned) in the Port itself, this could deliver around 30km of capacity. Ultimately, this would provide the opportunity to put back the need for Operation Stack to the most extreme of circumstances when no single off-road lorry park would be big enough to cope anyway. Importantly, it would increase the resilience and efficiency of a key trade flow on a daily basis.

In ensuring government does not deliver a flagship road improvement across the Thames only to move the major bottleneck to Dover, the earliest delivery of the A2 dualling within the same road period is imperative, but currently the scheme does not feature in Highways England's plans.

With the imperatives surrounding Brexit to maintain traffic fluidity looming large, prioritising resilience in the strategic road network supporting key gateways like Dover is essential. In delivering seamless end-to-end journeys, including via ports - and linked to last mile improvements to them (although in Dover's case it is the last few miles) – access to Dover has to be properly considered. The risks to trade, as has been very well publicised, are too great. Furthermore, delivering an enhanced road network with enhanced day-to-day operational resilience for UK-European supply chains would be seen as a positive outcome amidst all of the current uncertainty.

There needs to be a clear focus on delivering the right infrastructure to support the key trade flows at this crucial time for the economic future of the nation. Dualling of the A2 between Lydden and Dover together with a second Dover TAP on the A2 must be part of the essential road investment plans alongside the Lower Thames Crossing and with the clock ticking on Brexit, it is even more urgent to deliver this at the earliest opportunity to keep trade flowing between the UK and its largest trading partner.

Contact:
[Name redacted]
[Job title redacted]
Port of Dover
01304 240400 x[Extension redacted]
[Email address redacted]

NATIONAL INFRASTRUCTURE COMMISSION FREIGHT STUDY: CALL FOR EVIDENCE

A submission by:

University of Southampton, University of Lancaster, University College London and University of Westminster

As part of the Freight Traffic Control (FTC) 2050 project

- Professor Tom Cherrett (University of Southampton)
- Mr Fraser McLeod (University of Southampton)
- Professor Tolga Bektas (University of Southampton)
- Dr ThuBa Nguyen (University of Southampton)
- Dr Maja Piecyk (University of Westminster)
- Mr Julian Allen (University of Westminster)
- Ms Marzena Piotrowska (University of Westminster)
- Professor Adrian Friday (Lancaster University)
- Mr Oliver Bates ((Lancaster University)
- Dr Sarah Wise (University College London)
- Dr Kostas Cheliotis (University College London)

Background
We, the above named academics, are currently working on a project entitled Freight Traffic Control (FTC) 2050 (www.FTC2050.com) which has received funding from the Engineering and Physical Sciences Research Council (EPSRC). Partners in the project include freight transport companies and city transport authorities (including Transport for London). The FTC2050 project is currently investigating several topics that should be considered by authorities when developing integrated urban traffic management strategies to address and mitigate congestion which specifically tackle urban freight issues. These include to:

- Work with freight carriers to study their current operations in London and to quantify the geographical patterns and extent of driving and walking on vehicle delivery journeys.
- Identify the key issues and difficulties associated with these freight transport operations from public and private sector perspectives.
- Develop new computational approaches that can enhance vehicle and walking routeing and scheduling decision-making, and to demonstrate its potential effectiveness.
- Analyse what will happen to the efficiency of these vehicle operations and their negative traffic and environmental impacts if they are subject to slower vehicle speeds and more unpredictable journey time reliability in future.
- Trial and evaluate new methods of carrying out these deliveries that involve consolidation, including the use of walking porters to receive parcels at kerbside and carry out deliveries on-foot.
- Investigate using a ‘carrier’s carrier’ for last mile distribution where one carrier hands over goods to another to make the final deliveries using cleaner vehicles, in order to consolidate goods onto fewer delivery vehicles. Evaluate whether the logistics industry will be able to implement more efficient and sustainable operations in the face of pressures that include reducing road space allocation, slower vehicle speeds and logistics sprawl, or whether it will be necessary for a third-party ‘Freight Traffic Controller’ (which could be a private organisation or a city authority) to aid the management of vehicles over the urban last-mile for the more equitable and efficient use of road and kerbside space and time.

The answers provided below are based on the the work we are carrying out in the FTC 2050 project, and therefore refer specifically to freight (goods and service) transport in urban areas. We have only answered those questions which relate directly to the FTC 2050 project.

1. QUESTIONS

The questions the Commission is particularly keen to focus on in this initial phase of work are as follows. You may wish to respond to all or any of the below:

1. **What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?**

Freight transport infrastructure can potentially include all of the following (when considered from a public and private sector perspective): (i) the road, rail, water and air transport networks (and their availability in terms of space and time), (ii) interchange facilities between freight modes (such as ports, airports, rail terminals, (iii) kerbside and off-street loading space/time, (iv) warehouses and depots where goods are stored in the supply chain, (v) stockholding space (in commercial buildings that receive freight shops and offices), (vi) IT systems that support the use of public and private physical freight transport infrastructure, (vii) the freight vehicle fleet – and its time and space utilisation, and (viii) freight vehicle drivers.

The FTC 2050 project takes the view that there is expected to be a continued reduction in road space allocated to road freight vehicles in busy urban areas as a result of increases in bus and cycle lanes and pedestrian priority. As a result, without innovation, freight journeys will become more difficult, slower and less reliable. Also, without interventions by public sector bodies, there is also likely to be a continued relocation of freight depots ever further away from the centre of urban areas – these will be expected to move towards the urban fringe and beyond as land prices / rents continue to become ever less affordable by the freight industry.

Given these pressures, it is assumed that, at some point in the coming years, if the freight industry is not able to organise itself to bring about improvements in efficiency (through internal company initiatives and through joint operational collaboration between freight companies), then it may become necessary for a public sector governmental body to take the role of a 'Freight Traffic Controller' to manage the movement of freight into urban centres and, given all the freight and traffic data available to it, potentially become responsible for high-level allocation of goods flows between freight companies and their vehicle fleets in order to bring about more efficient and sustainable freight operations in urban areas.

Key constraints to the effective and efficient movement of freight in urban areas in the UK are:

- Traffic congestion
- Reducing road capacity for private motorised road vehicles due to reallocation of space and time to bus, cycling and pedestrians
- Road works
- Lack of kerbside stopping space and the design of freight needs into such kerbside space (together with the challenges that arise in making deliveries from the kerbside when segregated cycle and bus lanes have been installed). As the time spent looking for suitable vehicle parking space increases and the distance that the driver / service provider has to travel from the vehicle to the receiver increases, the efficiency of the freight operation diminishes (and the environmental and social impacts of the operation potentially increase)
- Demand and supply imbalances in the driver workforce (as the job of driving a freight vehicle and its rewards are often not viewed as attractive compared to alternatives)
- Turnover of freight vehicle drivers resulting in loss of tacit knowledge built up through driving / freight working experience

- Lack of IT tools / use of tools to improve the decision-making of inexperienced freight drivers (in relation to tasks such as vehicle loading, vehicle routeing and scheduling, vehicle, where to park the vehicle during unloading, whether to reposition the vehicle between deliveries or to walk (if distances are small and loads are relatively light), where the actual point of delivery is in a building – as vehicle manifests only provide registered address which may not be the delivery point which could be at side or rear of building on another street)
- Lack of collaboration between operators to share their freight vehicle capacity (due to issues of trust, security, privacy, and tradition/conservatism)
- Lack of available, affordable logistics /warehousing sites from which to make deliveries and collection. Unaffordability is resulting in logistics sites moving to the edge of / beyond the edge of urban areas and leading to increased stem mileages from depot to first delivery/collection address especially when serving inner and central urban locations. This has arisen due to lack of public protection of logistics land and a market situation in which the low profitability of freight transport operations mean that the industry cannot compete effectively with other land uses such as residential and office development
- Growing expectations from private individuals and companies about the speed with which they will receive their orders and servicing requirements (as demonstrated by the growing number of same-day delivery services and faster). This affects the ability to utilise vehicle load space and to consolidate goods flows. It also leads to more point-to-point vehicle operations on which vehicles may run empty in one direction
- Delivery failures especially in the case of last-mile deliveries to private individuals at their homes (because the receiver was not present to receive the goods and there was nowhere appropriate/safe to leave it instead). This results in the need for re-delivery of goods and additional vehicle activity. Returns of items ordered online are also resulting in additional road freight vehicle activity
- Lack of suitably-priced, shared collection point networks that can be used by private individuals for goods, and by service engineers for parts and tools that could help to reduce delivery failures and the need for service related motorised vehicle traffic
- Lack of enforcement of existing regulations concerning driver hours and vehicle safety, that add to the risk of vehicle incidents and collisions
- Lack of lorry parks and driver rest areas that provide affordable off-street stopping locations for drivers that need to take rest breaks either due to legal requirements or due to tiredness
- Lack of coordination of internal logistics in multi-tenanted buildings that can require delivery drivers to leave their vehicles parked on-street for substantial periods while they penetrate into and up large multi-storey buildings
- Reduction in storage space / capacity in many retail and commercial buildings over time, in efforts to use space for value-added activities, resulting in the need for more frequent, smaller deliveries
- Existing regulations/restrictions and lack of receiver facilities to permit a greater proportion of freight (goods and servicing) activity to take place during off-peak hours (especially in the evening and early morning) thereby making use of the road infrastructure when traffic levels are relatively low, thereby resulting in improved freight journey speeds and journey time reliability, and taking freight vehicles out of the daytime traffic peak
- Many freight deliveries in urban areas involve vehicles parking at the kerbside and the driver then making use of the pavement for the last leg of the delivery to the receiver's building. This can involve the use of trolleys, roll cages and other handling equipment depending on the size and weight of the consignment. However, the pavement is not normally considered as part of the road freight infrastructure by planners when designing the use of this space, and therefore freight considerations are not taken into account

1.1. What do you see as the key drivers to a successful freight system that is fit for the future?

- Collaboration – changes in attitudes to working between companies to share assets and resources including vehicle activities, and the IT technology to support this, together with demonstration of its benefits.
- Technology and collaborative data sharing platforms – affordable, widely available IT systems that can efficiently route and schedule vehicles, allocate goods and servicing workloads among vehicles/personnel (potentially between companies working together in a collaborative agreement), and allow operators to share vehicle and warehousing capacity.
- Vehicle technology – autonomous freight vehicles that facilitate more efficient driving, routeing and safety.
- Willingness by policy makers to allow and support meaningful real-world trials of up and coming freight delivery systems such as autonomous vehicles, droids and drones to quantify the industry and wider environmental benefits.
- Use of existing vehicle activity and manifest data held by freight transport operators by urban planners to help plan freight infrastructure including on-street loading/unloading space and time availability, and parking/loading bays (through a better understanding of freight vehicle trip generation patterns). Such insight could also be used to plan the necessary public freight infrastructure for major new development areas and regeneration zones, and to better understand the freight implications of designing pedestrian-friendly locations (and their freight infrastructure requirements).
- Greater efforts by the public and private sectors to work closely together to consider, trial and plan for the potential application and implementation of innovative freight transport operations, vehicle technologies and IT and physical infrastructures.

1.3. To what extent are the economic benefits of freight factored into wider transport infrastructure investment planning?

Insufficiently given the importance of freight (goods and services) operations to the efficient functioning and prosperity of the UK economy, and to individual's quality of life and standard of living in a modern consumer society. The goods and services provided by freight transport underpin the viability and smooth functioning of companies that have become reliant on demand-responsive, reliable supply chains that provide them with the goods and services they require when they require them.

1.4. What are the regulatory and legal issues that, if changed, could improve freight efficiency without increasing costs or reducing efficiency?

Regulations and restrictions concerning:

- Maximum vehicle sizes and weights
- Driver restrictions preventing those with car licences to drive up to 7.5 tonne gross weight vehicles (as was permitted until 1997)
- The difficulties in obtaining permissions to trial new vehicle technologies (such as longer, heavier vehicles, electric cargo cycles, guided and autonomous vehicles, drones, and pavement droids)
- Time restrictions limiting when sites can receive goods deliveries/collections (imposed as part of planning permissions for new buildings or later by Environmental Health Officers).
- Kerbside loading/unloading time and space restrictions
- Ensuring consistency in transport and traffic regulations between neighbouring areas with different political bodies (such as urban boroughs), and between different towns and cities. Especially in terms of regulations concerning regulations governing the types of vehicle technologies permitted to enter Low Emission Zones/Clean Air Zones Areas, and rules concerning the issuing of Penalty Charge Notices for parking and loading infringements

- Regularly reviewing the suitability of existing vehicle access and kerbside loading/unloading and parking regulations
- Using planning law to require large commercial buildings (especially those that are multi-tenanted) to: make use of shared supplier/transport services, use off-site consolidation services for deliveries, implement concierge for internal distribution of goods within buildings (rather than goods vehicle drivers having to penetrate such sites)
- Using planning law to protect logistics land in urban areas and other strategic locations in order to reduce freight vehicle stem mileages, improve vehicle load factors and hence reduce total freight activity
- Permitting public sector bodies to make land they own available for logistics uses (including consolidation centres and micro-consolidation centres) which may generate lower income than alternative uses but which support sustainable freight transport provision
- Using planning law to require suitable levels of storage space / capacity depending on the use and size of commercial buildings
- Using planning law to require suitable levels of off-street space for collection and delivery activity at the building

2. How might the demand for freight develop and change over the next 20-30 years?

2.1. How has the demand for freight, and types of freight, changed over the last two decades, and what will be the drivers for changes in the future?

Some factors may lead to a reduction in the demand for freight over the next 20-30 years such as the continued digitalisation of products (such as documents, letters, music, books etc.) and greater use of 3D-printing. Some widely-used technologies have replaced many products that were previously purchased in physical forms – for instance the uptake of the mobile phone and the apps developed for it have led to reductions in demand for home telephone apparatus and wiring, CDs and records, printed maps and atlases, and newspapers.

Continued change in the UK economy may well also result in changes in the nature of goods required and the type of vehicles needed to service this. For instance, the deindustrialisation of British industry over recent decades and the rise of the service economy has led to fundamental changes in the goods and service requirement and pattern of freight activity at many commercial land uses.

The rise of the on-demand consumer who expects rapid order fulfilment is likely to continue to gather momentum, given that the young are keenest among all age groups for the continuation of these trends, which will resulting in a growing demand for ever-more responsive freight vehicle operations to meet diminishing order lead times.

2.2. How is the freight industry planning for future changes in the demand? What levers might be available to shape future demand for freight transport?

On-demand retailers with significant investment funds (for example Amazon and major grocery retailers) are acquiring logistics land in urban areas to open networks of fulfilment centres to provide rapid response deliveries to their customers. Many traditional freight operators, as well as newer on-demand start-up delivery companies and IT providers are planning and developing new, rapid-response urban delivery operations and supporting IT infrastructures.

There is an important role for governmental bodies to play in education and awareness raising concerning the potentially negative traffic and environmental impacts of 'free' last-mile delivery operations, and thereby attempting to discourage environmentally-unfriendly purchasing decisions by companies and private individuals. If education and awareness-raising prove insufficient in addressing this problem, it may be necessary for public sector governmental bodies to extend their role in relation to this issue through the adoption and implementation of regulations concerning vehicle operations and/or pricing signals (which could potentially include taxes / charges on online transactions that include last mile delivery services to discourage those that require such rapid delivery that result in inefficient freight transport operations).

3. What effects does congestion have on the efficiency of freight movement and emissions?

3.1. How does congestion impact upon the productivity and economic contribution of freight? To what extent does congestion affect changes to mode, time or other freight choices?

3.2. How does congestion affect the environmental impacts of the movement of freight?

3.3. With limited space for new infrastructure, how can we better use our existing urban network to support freight? Are there changes – such as changes to modes, methods, or delivery times - that could help reduce the stress on the urban transport network?

Worsening road traffic conditions and difficulties finding suitable kerbside parking space in urban areas is making freight transport delivery and collection work ever-more difficult to perform to exacting customer requirements. Parking difficulties can force drivers to park further from the point of delivery, cover increasing distances on foot and risk incurring parking penalties. Thereby traffic congestion and lack of kerbside stopping space impacts on freight vehicle journey time and journey time reliability. This has cost implications for the freight transport operator (in terms of more expensive delivery and collection operations) and reduces the revenue earning potential of the vehicle and driver as the total amount of work that can be achieved in a given period of time reduces. From the perspective of a commercial shipper and receiver of the goods, longer or increasingly unreliable journey times can lead to lost sales, reductions in employee productivity, and in the most extreme cases, an inability to continue the core activity. When the receiver is a private individual, late / unreliable deliveries can lead to significant inconvenience and loss of earnings. Cases of late or unreliable visits from service vehicles (e.g. engineers or technicians whose journey purpose is to provide a service rather than deliver/collect goods) can be greater than in the case of goods movements, especially when the service is urgent and critical (such as in the case of malfunctioning payment systems in shops or failure of temperature control equipment in grocery stores.

Traffic congestion typically increases the environmental impacts of freight transport operations (either for goods or servicing provision) as it typically either involves vehicles idling, engaged in stop-and-start movements, and operating at sub-optimal speeds from a fuel efficiency perspective. Where kerbside parking space is unavailable it can increase vehicle distance travelled as drivers circulate looking for a suitable space. Similarly drivers unable to find kerbside parking space in order to deliver goods or services, may choose to simply queue or double park while waiting for a parking space, causing further impacts on road traffic speeds and potentially increasing the danger posed to other road users. In instances that drivers are forced to park further from the delivery/collection point than they would have wished, this increases the distance that they driver must travel on-foot, which can be especially problematic in the case of heavy and bulky items often requiring the use of handling equipment, thereby posing additional threats to the safety and wellbeing of the driver and other pedestrians.

4. How can freight lower its carbon and air quality impacts?

4.1. Are there efficiencies within freight management and distribution practices that could help reduce the CO_2 and NOx emissions from freight?

- Any initiatives that lead to increases in vehicle loads consolidation (in weight and volume terms) and reductions in vehicle empty running will have this effect. Improvements in load consolidation and reductions in empty running result in improvements in vehicle km, journey time, fuel consumption, kerbside space and time use per unit of freight moved. Consolidation can be achieved in many different ways and at many different locations in the urban supply chain, and is already achieved to varying degrees in many freight transport operations through efficient transhipment operations at depots in situations in which sufficient goods flows exist such as in grocery retail distribution and overnight parcel networks. However, in some cases, urban consolidation facilities can be required to achieve such benefits. These facilities can include: Urban Consolidation Centres, micro-consolidation centres and mobile depots, and collective procurement approaches to achieve consolidation in large multi-tenanted buildings and local neighbourhoods. In addition, through operational collaboration between carriers, freight transport operators can facilitate goods consolidation upstream in their supply chains so as to reduce vehicle trip generation prior to its last-leg despatch to/within the urban area - with companies working together to share their work for given geographical locations.

- In FTC 2050 we are examining the scope for operational collaboration between freight transport operators to share their freight work and capacity in order to achieve outcomes that are more efficient from a company perspective and which also lead to reductions in vehicle activity and energy consumption. For this to be achieved requires suitable IT systems and data and load sharing between companies (and the overcoming of the various barriers that exist to this being acceptable)
- Human portering systems for the last mile – see answer to question 5 for further details.
- Greater use of electric and other alternatively-fuelled road freight vehicles.
- Driver training
- Logistics management using sophisticated IT planning systems and telematics equipment.

4.2. What role do alternative fuels such as electricity, Liquid Petroleum Gas and biofuels have to play? What are the barriers and challenges to wide-scale uptake of alternatives to diesel and what could be done to help remove these issues?

Topics that require consideration include:

- suitable and affordable charging/recharging infrastructure for electric freight vehicles (and determining the most appropriate electrical supply system given the location i.e. on-board fully-charged batteries, overhead catenary for recharging, electrified roads/railroads). For freight operators currently operating electric vehicles with on-board batteries, recharging is problematic given that they cannot readily use roadside recharging points and instead require recharging infrastructure in their depots. At present, freight operators are subject to the costs of installations of this recharging infrastructure / upgrades to grid connections at their depots but do not subsequently own this asset, making investment difficult to justify.
- accessible recharging infrastructures for alternative fuels so that freight operators are prepared to make such vehicle fleet investment decisions.
- dispensations on the payload of electric vehicles to take account of payload lost to battery weight, so that these vehicles can compete with diesel vehicles on a more equal footing.
- vehicle manufacturers to achieve comparable vehicle retail prices, maintenance costs and whole of life operating costs for alternatively fuelled vehicles compared with diesel equivalents.

4.3. What technologies could best and most realistically be utilised to manage the carbon impacts of freight, both within urban areas and on longer strategic journeys?

Some sustainable freight distribution systems in cities require the availability of a consolidation centre or micro-consolidation centre in inner and/or central urban areas. For such transhipment points to be financially viable it is likely that the public sector would need to make such sites available from public land holdings or support the costs of such facilities (given high land values in urban areas and the relatively low profit margins involved in freight transport).

Micro-consolidation centres have the potential to support the use of electric vans and cargo cycles and other alternatively-fuelled delivery vehicles in inner and central urban areas (and can be supplied with goods for delivery during in off peak hours).

5. How could new technologies be utilised to increase the efficiency and productivity of UK freight?

5.1. How will new technologies change the capacity and performance of the freight transport network? Over what timeframes might these new technologies begin to affect the freight transport network?

5.2. How can the use of data such as real-time traffic information by artificial intelligence and machine learning systems help to improve freight efficiency and productivity? How might this affect the business models and requirements of freight in the future? Are there any barriers to the greater use of data in freight?

5.3. How do you see technologies such as HGV platooning, digital railway signalling, and autonomous vehicles being integrated into freight distribution?

5.4. How might regulations and physical infrastructure need to adapt to new technologies and business models in the freight sector?

Autonomous vehicles, drones and pavement robots/droids are currently generating much interest and research in relation to urban freight transport. Although all these technologies may be ready for use in a technological sense within the next 10 years, it is likely to take longer than this before they are widely used in freight operations due to the need to achieve acceptance by the public in terms of their safety, worker concern about the resulting job losses, and regulatory change to facilitate their use on British roads, especially in busy, complex urban areas.

In the use of autonomous vans and lorries, it is likely to be in the region of 20 or more years before they are fully operational in the UK. In addition, these vehicles are unlikely to be capable of making collections and deliveries to buildings as is required in modern logistics operations. Therefore, it is likely that they will need to be work in conjunction with human porters who would meet these vehicles at the kerbside and perform the last leg of the delivery to/into the building on-foot. This concept of human portering in conjunction with vehicles for deliveries in urban areas is currently being investigated in the FTC 2050 project (see below for further details).

In the case of aerial drones it is, at present, difficult to see how they will meet existing safety and security regulations to be used for freight operations in urban areas. In any case, they are not best-suited to operations in urban areas, which are most efficiently served by road vehicles capable of carrying substantial loads, given the large populations and high drop densities. Drones have several operational difficulties when thinking about urban freight. These include: how to get safely inside buildings – they are unlikely to be flown through doors and windows and cannot be navigated inside buildings; they cannot readily be used to travel up or down buildings internally, and are currently incapable of posting items through letter boxes etc. For drones to become potentially of use in urban areas, it may require the extensive redesign of delivery reception facilities at commercial and residential buildings. Drones, if they were to be used for goods transport in urban areas, would be best suited to the transport of time-critical, small loads such as medical and healthcare items required on an urgent basis.

There are several current examples where small machinery parts and medical samples have been successfully moved by drone between fixed locations (e.g. DHL Parcelcopter (http://www.dpdhl.com/en/media_relations/specials/parcelcopter.html), and the Matternet Station (https://mttr.net). Despite the legal and regulatory hurdles, drones do offer potentially large savings in journey times and emissions over conventional transport with a study by the University of Southampton looking into patient sample movements from seven central London clinics to a main hospital suggesting time and emissions savings of up to 61% and 93% respectively over the conventional courier operation.

Drones are more likely to have a freight transport role to play in far less dense, rural locations, where safety and security concerns would be far less, and existing road networks make delivery by road vehicle slow and inefficient.

In the case of delivery robots (i.e. droids using the pavement network) they also currently exhibit various shortcomings and weaknesses that prevent their widespread use for freight transport operations on urban pavements. These include problems in pressing buttons to cross roads, knocking on doors and pressing doorbells, climbing stairs, calling lifts, etc. Droids would also be likely to interfere with pedestrian flows in busy urban locations with high footfall. They are also prone to theft and vandalism on the street. Droids are more likely to be used for freight operations inside buildings rather than on-street in the coming years. For instance they have already been deployed within factories and hospitals for moving goods over relatively short, repetitive uncomplicated distances. For example, Aethon TUG autonomous mobile robots (or droids) are currently used in manufacturing plants such as those of Continental Automotive Systems. In addition, 450 of these Aethon TUG droids have so far been deployed in American hospitals to transport medicines, medical tools and equipment, meals, linen, and waste, and using wi-fi are able to open doors and call lifts (http://www.aethon.com/tug/how-it-works/). A trial using a droid for making deliveries in London is already underway in Greenwich by Starship Technologies but faces the operational difficulties outlined above in relation to pavement operations and building access (https://www.starship.xyz/starship-launches-in-uk/).

A 2017 report by Cebr indicated a positive relationship between robotics automation and economic development, and that the UK density of robot units in workplaces per million hours worked in 2015 was less than one-tenth of that in the USA, Japan and Germany. This indicates the potential for substantial growth in uptake in UK working environments (https://cebr.com/reports/new-study-shows-u-s-is-world-leader-in-robotics-automation/).

Delivery robots are more likely to have a viable future in the coming 20 years working inside buildings for goods distribution than for deliveries by street to buildings. Also, unlike aerial drones, they do not have a potential for outdoor use outside of urban areas.

It is therefore likely to be several decades before drones and delivery robots are deemed safe and operationally and financially feasible for use in mainstream, widespread freight transport operations in public air space and on public pavements in urban areas.

By contrast, for technological, operational cost, safety and regulatory reasons, delivery portering concepts using autonomous road freight vehicles in conjunction with human delivery porters are likely to materialise more quickly in urban freight transport operations. This concept of using humans (street porters) for the last stage of deliveries is being investigated in the FTC 2050 project to investigate the role that such portering systems could play in making road freight transport operations more efficient in urban areas for suitable goods flows, reducing vehicle driving distances and times, as well as the time spent and space occupied by vehicles at the kerbside (FTC 2050 project work indicates that current average vehicle kerbside stopping times of approximately 8 minutes in parcels operations in central London could be reduced to 30 seconds by using on-foot delivery porters receiving bag-loads of parcels at the kerbside, together with a substantial reduction in total vehicle kerbside stops necessary). These human portering systems would also be able to be used in conjunction with future autonomous road freight vehicles when these vehicles are ready for deployment. Given that autonomous vehicles will only be able to stop at the kerbside or off-street loading areas, human assistance will therefore be required for the last-leg of the delivery from the vehicle to the delivery point in the loading bay or elsewhere inside the building. These portering solutions will also offer employment opportunities that will help compensate for the loss of freight vehicle driving jobs that the deployment of autonomous vehicles will be responsible for.

6. Are there good examples internationally of freight systems, policy, infrastructure or technology development and implementation that the UK can learn from to increase freight efficiency and/or reduce the carbon and congestion impacts?

Several reviews of urban freight transport initiatives taken by the public and private sectors have been published in recent years that may be of assistance to the National Infrastructure Commission. Academic members of the FTC 2050 team have been involved in several of these reviews:

Allen, J. and Browne, M. (2017) Success factors of past initiatives and the role of public private cooperation, Deliverable D2.3, CITYLAB project. Available at: http://www.citylab-project.eu/deliverables/D2_3.pdf

Giuliano, G., O'Brien, T., Dablanc, L. and Holliday, K. (2013) Synthesis of Freight Research in Urban Transportation Planning, National Cooperative Freight Research Program Report 23, Transportation Research Board. Available at: http://www.trb.org/Publications/Blurbs/168987.aspx

Holguín-Veras, J., Amaya-Leal, J., Wojtowicz, J., Jaller, M., González-Calderón, C, Sánchez-Díaz, I., Wang, X., Haake, D., Rhodes, S., Hodge, S., Frazier, R., Nick, M., Dack, J., Casinelli, L. and Browne, M. (2015) Improving Freight System Performance in Metropolitan Areas, National Cooperative Freight Research Program Report 33, , Transportation Research Board. Available at: http://www.trb.org/Main/Blurbs/172487.aspx

Rhodes, S., Berndt, M., Bingham, P., Bryan, J., Cherrett, T., Plumeau, P. and Weisbrod, R. (2012) Guidebook for Understanding Urban Goods Movement, National Cooperative Freight Research Program Report 14, Transportation Research Board. Available at: http://www.trb.org/Main/Blurbs/166828.aspx

A review of urban last-miles delivery operations has been produced as part of the FTC 2050 project and is available at:

Allen, J., Piecyk, M. and Piotrowska, M. (2017) An Analysis of Online Shopping and Home Delivery in the UK, Internal Report, February 2017. Available at: http://www.ftc2050.com/reports/Online_shopping_and_home_delivery_in_the_UK_final_version_Feb_2017.pdf

Reference: Consultation 107

Cadent Gas Limited
Brick Kiln Street, Hinckley
Leicestershire LE10 0NA
cadentgas.com

Date
2nd March 2018

National Infrastructure Commission

Cadent
Your Gas Network

Dear National Infrastructure Commission

Cadent response to consultation on Freight Study Call for Evidence.

Cadent is a gas distribution company providing gas to 11million homes and businesses through 130,000km of pipelines. We own and operate four regulated gas distribution networks covering a geographically defined service territory that spreads across the East of England, North London, the North West and the West Midlands. We welcome the opportunity to respond to NIC's Freight Study Call for Evidence.

Cadent is committed to delivering energy to consumers, which include those in the freight sector. In addition, Cadent recognises the importance of continued efforts in reducing congestion and greenhouse gas emissions as well as improving air quality in the UK, which benefits all consumers.

Background

Reducing the future growth in oil demand from freight vehicles is challenging but entirely possible given today's technology. Opportunities arise from 3 main areas;

- Systemic improvements in road freight operations and logistics
- Vehicle efficiency improvements including aerodynamic retrofits, improved truck engines, transmissions and drivetrains
- Use of alternative fuels which also support other key political and environmental goals e.g. diversifying fuel supply, reducing CO2 and other air pollutant emissions

Converting biofuel resources to renewable gas provides an opportunity to substitute diesel with natural gas. The freight transport sector is recognised as being hard to decarbonise, so use of renewable gas in transport provides significant emission reductions in urban areas (see Cadent response to CCC Bio resources consultation for estimates of renewable gas). In addition to reduced emissions of GHGs and air pollutants, natural gas maintains security of supply.

Delivering lower emissions and improvement in air quality from freight transport requires a wider, more strategic approach, addressing local and regional infrastructure needs. It is essential that decision makers consider a whole energy system solution, including both gas and electricity networks, ensuring alternative fuels are available at sufficient scale, ideally ahead of consumer demand, or as with the decarbonisation of the electricity grid for plug-in vehicles, following in the short to medium term.

Cadent believe the low carbon fuel of choice for HGVs and buses over the coming years will be bio-CNG. There is strong evidence from the first high pressure (LTS) connected CNG refuelling station at Leyland (in partnership with Waitrose and CNG Fuels) that there are significant emission reductions from this approach. There is also strong driver and operator support for these vehicles, combined with quieter operation. Over the short / medium term biomethane represents the only practical means of decarbonising HGVs / heavy freight vehicles, and must also be central to any future clean air strategy.

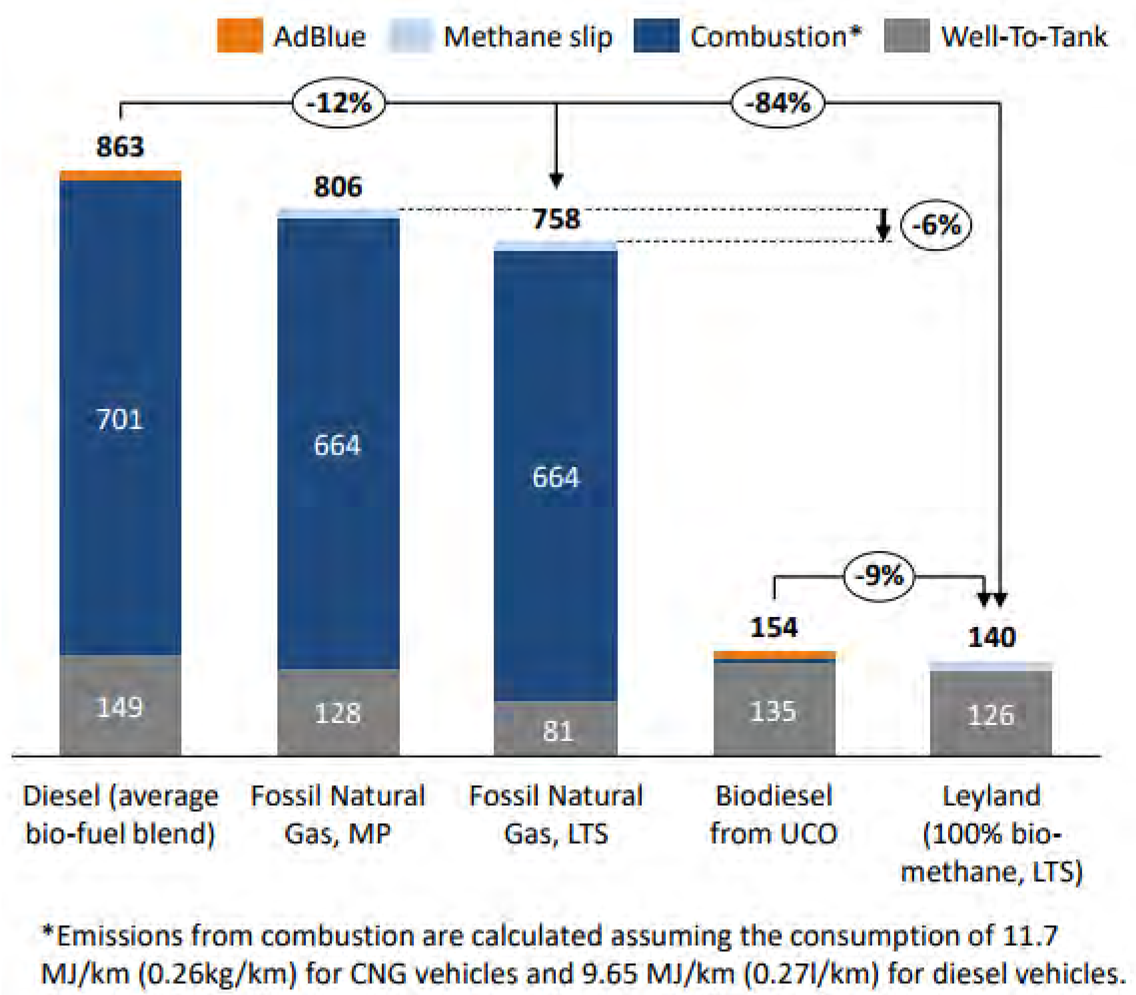
Cadent responses to specific questions.

As requested, in our detailed response below we have answered only those questions in which Cadent has knowledge or expertise. A summary of the key points we wish to make are made in bullet point form ahead of a detailed response.

4.2 What role do alternative fuels such as electricity, LPG, and biofuels have to play? What are the barriers and challenges to wide-scale uptake of alternatives to diesel and what could be done to help remove these issues?

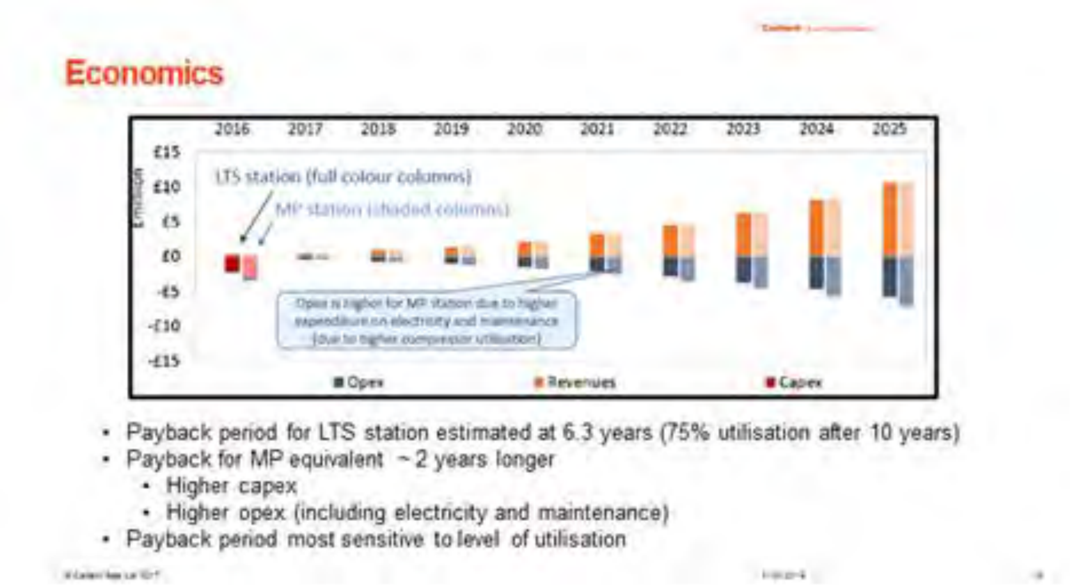
- A range of alternative fuels will be needed in the future and the market should not be skewed by policy – businesses should be free to make the most appropriate choices for their operations in line with emissions reduction targets
- Compressed Natural Gas (CNG) offers a proven, low emission alternative to diesel today enabling deep, cheap and rapid decarbonisation
- The emissions from production, distribution and supply must be considered for "zero carbon" fuels such as electricity
- Uncertainty of fuel duty differentials between diesel and natural gas is hampering conversion to low carbon energy in the HGV sector
- CNG acts as a bridge between diesel and hydrogen

The emissions of a vehicle are largely dependent on the fuel consumed by that vehicle. Alternative fuels to diesel now offer significant reductions in Carbon Dioxide and Nitrous Oxide emissions when compared to diesel. Currently, many fleets are composed of a variety of Euro Standard vehicles, of which the Euro VI is the most modern and least polluting. In a recent study by Element Energy (Element Energy 2016), the carbon dioxide and nitrous oxide emissions from a fleet running on Biomethane in the form of CNG were compared to their diesel counterparts. The study found that a switch to CNG Biomethane had resulted in an 84% reduction in well to wheel emissions of Carbon Dioxide.



Independent Assessment of the Benefits of Supplying Gas for Road Transport from the Local Transmission System, *Element Energy*, 2017 – Demonstrating contrast in CO2 emissions.

This study also identified the importance and value of connecting such refuelling infrastructure to the Local Transmission System (LTS) over the Medium Pressure (MP) network, identifying a 79% station-specific carbon emissions reduction of LTS over MP connections. In addition to the carbon reductions of the LTS connection, there are financial benefits over the MP connection. The higher inlet pressure of gas from the network results in less electricity requirement for compression and thus a reduction in Operating Expenditure. As such, the payback period for the connection to the LTS is brief (see below), thus making the economic case for infrastructure development for gas HGVs.



Payback and economics of connection models for gas stations, *Cadent*, 2017

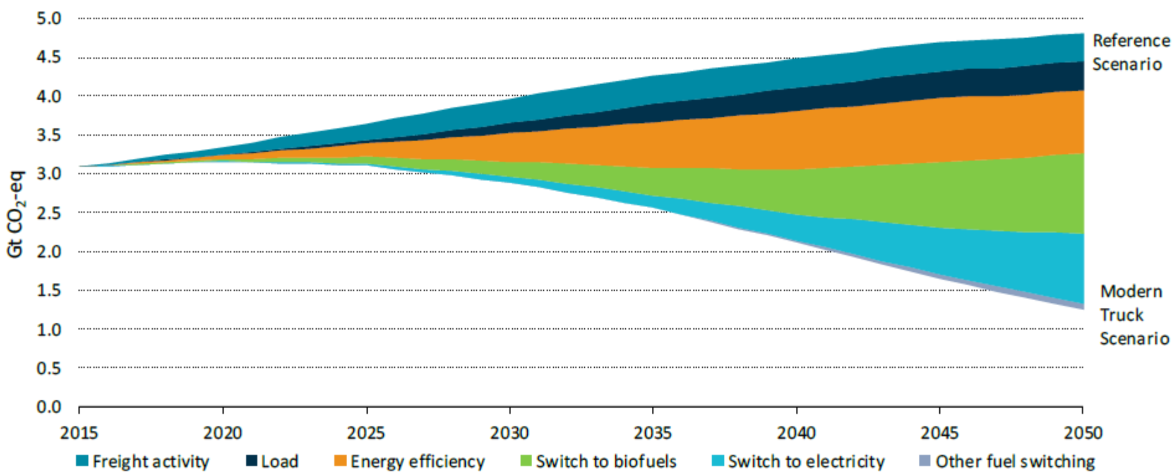
Electric vehicles have zero tailpipe emissions; however, there is currently limited availability of electric vehicles in the freight market. This is largely due to the current limitations of battery technology in providing the required power and energy storage capacity of freight operations, which often involve heavy vehicles travelling long distances.

When considering the role of alternative fuels, it is important to consider the emissions resulting from the production, distribution and supply of the fuel. This is of particular consideration for electric vehicles for which zero tailpipe emissions makes an attractive lure. However, electric vehicles are typically charged from the local electricity distribution network, fed from the national grid. In 2016, 75.5% of UK electricity was produced from non-renewable sources (DUKES, 2016). While there has been significant progress in the decarbonisation of UK power supply, it is important to not overlook the emissions that remain in the production and distribution of electricity, and which will remain for many years until the Grid is fully decarbonised. The production and distribution of liquid fuels such as LPG also carry emissions as these are currently distributed around the UK by diesel vehicles. Emissions from the Gas distribution network do exist although significant progress has been made in the reduction of leakage and other sources of emissions through the RIIO regulatory framework. (Ofgem Annual Report, 2016)

There is currently sufficient capacity to deliver predicted future energy demand for transport via the existing gas network, which is currently undergoing a mains replacement programme to effectively manage the risks arising from potential leakage from older cast iron gas mains. Other fuel transportation systems such as electricity distribution do not have sufficient capacity at present and to deliver future energy needs of transport via electricity would require significant reinforcement of local distribution systems, presenting significant cost to end consumers (UKPN, 2014), and wide scale disruption to make upgrades, with associated business and transport impact. In addition, exploratory work currently underway is paving the way to a gas network that transports and supplies increased (or up to 100%) hydrogen content, which will act to significantly reduce or ultimately eliminate, carbon emissions from the transportation of gaseous fuels.

Due to current vehicle availability and predicted advances in battery technology (Narrowband on Energy, 2017), as well as the practicalities of freight operations, it is clear that a variety of fuels and vehicle types would be most appropriate to decarbonise freight and reduce nitrous oxide emissions. Indeed, the Mobility Model explored by the IEA in 2017 (as shown below) demonstrates the need for a variety of energy types in the fuel mix of the future in order to achieve desired reductions in emissions. For short-range urban freight operations, smaller electric powered vehicles would seem a practical solution to issues of air quality, emissions, noise and congestion, if the electrify network challenges can be overcome. For longer distance, inter-city operations, biomethane fuelled Heavy Goods Vehicles would be the most practical option to reduce operating costs (biomethane is currently cheaper than diesel) and emissions.

Figure 39 • Contribution to GHG emissions reductions by measure in the Modern Truck Scenario, relative to the Reference Scenario



Source: IEA (2017a), Mobility Model, June 2017 version, database and simulation model, www.iea.org/etp/etpmodel/transport/.

IEA Mobility Model, *IEA*, 2017

Additional barriers to the expansion of alternative fuels and associated vehicles include the current uncertainty around fuel duty differential between alternative energies and diesel. Currently the fuel duty differential of around 50% provides a significant incentive for transition to CNG due to the OPEX savings accrued over the life of the vehicle. However, the current planned review of this fuel duty casts uncertainty over the future differential and is considered a blocker to fleet transition. The Renewable

Transport Fuel Obligation currently extends to 2032 and thus provides greater certainty for long term planning, confirming the longevity of the fuel duty differential will provide necessary certainty.

Therefore, Cadent believes that alternative fuels have a large and significant role to play in the reduction of emissions from freight. However, we stress that this can best be achieved by encouraging a variety of fuels so as to make most efficient use of vehicles, infrastructure and fuel availability while reducing the cost and operational impacts of such changes to industry and consumers. The alternative would be to push fleet operators into sub-optimal vehicle and fuel types that would have negative impacts on operational, cost and emissions performance.

4.3 What technologies could best and most realistically be utilised to manage carbon impacts of freight, both within urban areas and on longer strategic journeys?

- A range of fuels and vehicle types are necessary to provide the reduced emissions without impacting operations of fleets
- Electric vehicles are developing quickly, but CNG is market ready and provides a sustainable bridging fuel to future hydrogen, with existing incentives for CNG sufficient to encourage adoption
- The development of data capture and processing technologies will be needed to maximise logistical efficiency

As discussed in response to question 4.2, it is clear that a variety of different technologies, particularly in the areas of vehicle and fuel types, are required to achieve the desired reductions in carbon emissions. Indeed, technological developments at all stages of the production and delivery of fuel as well as the management and operations of fleets are necessary. Cadent strongly believes that Biomethane and Natural Gas in the form of CNG and LNG have key roles to play in bridging the gap between current diesel freight operations and a future zero-carbon state based on hydrogen fuelled vehicles. CNG delivered by the existing gas infrastructure provides a reduced carbon option, while paving the way for economically viable and sustainable transition to zero carbon hydrogen delivery. Electric vehicles do have potential and battery technology is developing quickly. However, there is a significant payload penalty for HGVs running on batteries (payload penalty of between 3.5 and 5 tonnes). This payload sacrifice reduces the amount of goods that can be carried, thus reducing the financial efficiency of the fleet. Indeed, in order to carry the same mass of goods, additional journeys must be made, thus increasing emissions and congestion. In comparison, CNG vehicles currently operate with little payload sacrifice compared to diesel and thus do not impact the operation of fleets. Cadent strongly believes that while CNG does not provide Zero tailpipe emissions, it acts as a vital bridging fuel between current diesel and future hydrogen, which can be drawn from the gas network in the future. Hydrogen also has zero tailpipe emissions and current exploratory work by Cadent is laying the foundations of network supplied hydrogen fuel. Furthermore, Biomethane in the form of CNG can contribute to achieving the government's Biofuel target. Utilising Biomethane in HGVs can reduce the carbon emissions of the fleet while also increasing the biofuel utilisation in transport.

The role of data and its supporting technologies in terms of capture and processing should not be overlooked. There are clear applications in traffic management and driving style as well as maximising logistical efficiency, all of which help provide incremental but vital carbon reductions, while managing reduction in carbon emissions from freight in tandem with other key issues such as congestion, air quality and noise pollution in urban areas.

Q6. Are there good examples internationally of freight systems, policy, infrastructure or technology development and implementation that the UK can learn from to increase freight efficiency and/or reduce the carbon and congestion impacts?

- Good examples of policy supporting low carbon transitions in freight have been seen in the EU, China and the USA
- A holistic approach, providing both infrastructure and vehicle incentives together has been seen to deliver the best improvements
- Governmental guidance on strategical positioning of critical refuelling infrastructure helps encourage market development

One method of tackling carbon impacts of freight is to diversify fuels away from diesel. However, this is only practicable if the cost of fleet conversion and cost of fuel are competitive to diesel and conversion represents a solid investment for fleet operators and infrastructure providers.

Gas is, of course, not the only alternative fuel to diesel and other fuels such as electricity and hydrogen have key roles to play in the energy future of the UK. However, for freight, electricity and hydrogen vehicles are currently not market-ready and significant barriers remain to their expansion. Gas, in the form of CNG and LNG currently offer the most practical alternatives to diesel for HGVs. Currently, there are approximately 23 million natural gas vehicles globally, with high market penetration in the Middle East, South America and Europe. In Europe, Germany and Italy lead the way.

Recently, three key areas globally have encouraged expansion in gas fuelled HGVs: USA, EU and China.

<u>United States of America</u>

- Policy: Fixing America's Surface Transportation Act

- Encouraging building of CNG refuelling stations strategically across the USA from 2015.
- Deployment targets for alternative fuels set by Department for Transport.
- Sets maximum distance of 150km between CNG stations (1,741 built by 2017) and 200km between LNG stations (143 built by 2017) – in line with European Ten-T Core Network Directive. (NGV America, 2017)

- Fleet Operators including UPS, FedEx and Dillan Transport are increasing the share of alternatively fuelled vehicles in their fleets, encouraged by greater differential in taxes and levies of diesel and alternative fuels provided by the Alternative Fuel Excise Tax Credit.

<u>European Union</u>

- Gas Networks Ireland, who own and operate gas transmission and distribution infrastructure in the Republic of Ireland, have recently announced (Gas Networks Ireland, 2017) the Causeway Project, which provides for the construction of 14 gas refuelling stations (vision for 70 after 10 years) for vehicles, together with €20,000 grants for vehicle conversion. This project tackles barriers to market conversion away from diesel at both the infrastructure and fleet level, removing the "chicken and egg" scenario, which currently plagues the UK.

Causeway Project, *Gas Networks Ireland*, 2017

- In Germany, the development of the Natural Gas Vehicle market has also benefited strongly from this type of joined up approach. In Germany, fuel providers of gas have committed to building a defined number of refuelling stations with collaboratively agreed geographical coverage to avoid duplication, gas distribution companies have pushed market development and the government has committed to maintaining a fuel duty differential between diesel and natural gas.

China

- Air Quality issues, particularly in cities and short range intercity routes are driving a central government push to cleaner fuels.
  - A significant increase in stations has been seen (c.1,000 in 2008 up to 7,950 in 2016).
  - Number of natural gas vehicles operating in China has grown from 6,000 in the year 2000 to 5 million in the year 2016 (Wang, 2016).
  - 56% of new trucks produced in China are dedicated Gas vehicles (Wang, 2016).

As can be seen by these examples, from a UK policy perspective, there are three important near term policy enablers:

(i) Tightening fuel economy standards and expanding their geographical coverage; standards can be supported by differentiated vehicle taxation to incentivise purchase of efficient trucks;

(ii) Data availability and data sharing; underpins systemic improvements in freight logistics, capitalising on advancement in digital technology;

(iii) Support for alternative fuels and vehicles; covers four key areas;

a. Research, Development and Deployment;
b. Market uptake of alternative fuelled vehicles;
c. Adequate access to charging and refuelling infrastructure;
d. Availability of alternative energy carriers;

This policy support, together with developments in infrastructure availability will create necessary conditions for the development of a low carbon freight sector at sustainable cost.

Yours sincerely
By email

[Name redacted]
[Job title redacted]

National Infrastructure Commission – Freight Study Call for Evidence

Submission by the Chartered Institute of Transport and Logistics (CILT)

Introduction

1. CILT (UK) welcomes the National Infrastructure Commission's study into freight in the UK covering all modes: road, rail, water and other modes. We see it as a logical and essential exercise following its consultation on developing a National Infrastructure Assessment, to which we also responded.
2. The Chartered Institute of Logistics and Transport (CILT) is the membership organisation for professionals involved in the movement of goods and people and their associated supply chains. It is independent of commercial organisations in the sector, does not undertake lobbying of any kind and uses its broad membership to form balanced viewpoints and policy recommendations.
3. Members of the Institute are involved in the management and design of infrastructure, systems, processes and information flows and in the creation, management and development of effective organisations. The work of our members impacts directly on people, society and the environment, on business profitability and economic growth.
4. The CILT represents logistics and transport professionals who work across a wide variety of disciplines and modes. We have an industry forum structure organised in Professional Sectors that provide specialist activity for a particular area of interest whilst continuing to offer plenty of opportunity for involvement across the whole spectrum.
5. This response to the call for evidence has been prepared by the CILT Freight and Logistics Policy Group with support from the Rail and Aviation Policy Groups with the aim of providing a modally independent and objective point of view.

Overview and Q1: Key constraints

6. In our previous submission, CILT stressed a core theme that the NIC take an holistic approach in considering how to deliver its aims, from the way proposals for transport schemes are planned and assessed to the way performance is measured, new technology is provided and the way users pay for transport. This approach will focus investment on delivering the widest possible benefits to all members of society, help promote changes in the way people and goods use transport so that networks and cities function more efficiently and ensure charges are fair.
7. This holistic supply chain oriented approach is continued in our response to the call for evidence following.
8. The **key constraints to the effective and efficient movement of freight in the UK** can be simply summarised as:
    a. Capacity, congestion, emissions, conflicts. Freight is an exclusively private sector commercial operation that runs on public sector road and rail networks; it is constrained by that capacity and land use planning which may impede its access to suitable sites for terminals and warehouses: ports, rail, distribution centres.
    b. It has been suggested that freight is simply a derived demand, moving goods and services that are made and demanded in the economy. This is too simplistic since new logistics models have enabled long term growth and each in turn has been dependent on new infrastructure. e.g.: canals, railways, motorways, international container freight, etc. Each of these innovations have driven step changes in economic growth by making goods available with lower transport costs, passing on economies of scale in manufacturing and sources of supply to drive economic growth.
    c. The latest revolution is the growth in e-commerce which is enabled by high speed internet together with advanced large-scale warehouse technology combined with integrated package delivery networks.

d. In simple terms, all operating model innovations to which transport infrastructure contributes have increased the distance over which goods can be supplied by reducing the cost of the movement and exploiting the reduced costs of production and supply.

e. Freight has been neglected in policy terms because, first, it has continued to deliver without the need for political intervention and, second, the political priority is, understandably, the movement of people. One of our contributors wrote eloquently:

In assessing infrastructure investment and development, the impact of freight has often been overlooked; partly because the safe and efficient movement of people is a greater priority and partly because the true economic benefit and returns from freight transport are not clearly measured. This means that it is common to characterise freight particularly road freight as a problem rather than a necessary service which allows all aspects of the physical economy to function.

f. Stagnating productivity in the UK and its significant 'gap' vs. other major nations may in part be due to our declining manufacturing mix, the maturity of our distribution systems and their declining effectiveness as they operate on increasingly congested public road and track resources.

g. The fact is that there is no definitive work on how freight interacts with the economy[1] [2]. As a result, the CILT Freight and Logistics Policy Group is about to embark on an holistic review of all the published sources, alongside developing some new models for understanding the economic impact and value of freight.

9. **The key drivers to a successful freight system that is fit for the future are**

a. The provision of cost effective capacity (road space, rail paths and land for holding and transit) priced consistently to its users across modes to reflect the externalities caused by freight: e.g. congestion, emissions and air quality.

b. Infrastructure measures for a successful freight system will specifically include (1) urban freight systems and (2) inter-urban systems and (3) the means to integrate the two. We develop these strands later. However, one of our contributors wrote eloquently:

Urban/Interurban Logistics - there is considerable focus on urban logistics, but it is essential that the NIC understands that, as we said in our NIA response 'supply chains that end in cities originate in other areas. Almost all are regional, most are national and many are global. There is a continuum from point of production (in the UK or abroad) to the point of consumption in UK cities. Inter-urban transport infrastructure is thus of crucial importance to the successful economic and social functioning of cities, as well as to the UK as a whole. We recommend that the NIC should place significantly more emphasis on these interurban links than was evident in the draft NIA. This applies to both road and rail infrastructure and to the intermodal facilities needed to achieve a lower carbon/lower emission supply chain to, and within, urban areas'.

c. The CILT has long advocated road user charging for all freight vehicles, including vans, as a replacement for fuel and VED taxes; charges would be varied by time of day to encourage new operating models that work at off peak times. Vans are key element of the freight and logistics mix. When the use of vans as well as trucks is factored, it occupies significant road space – we estimate 25% to 35% on inter-urban carriageways and in cities around 25%; there are significant variations around this number time of day and day of week.

d. Such an approach would recognise the disproportionate contribution of freight to accidents, emissions and health issues and put in place the right relativity between road and rail. Rail for inter-urban is considerably better from both an environmental and congestion perspective. It is important to note that the CILT has significant reservations on the scope and accuracy of the data in Webtag which is the public sector reference for scheme justifications.

e. Positive planning for land use to support an integrated system is essential; this is primarily a private investment for freight and land values for logistics compete unfavourably with other land uses including housing.

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[1] Independent Transport Commission (2014) 'Improving the efficiency of Freight Movements: the contribution to UK economic growth'

[2] The Scottish Government published a report in 2006 and the DfT issued in 2011 The Logistics Growth Review. CILT responded to that review with concerns about the stats and the context

f. **The key freight corridors are well-charted, and the bottlenecks identified**[3]. The worst bottlenecks are where constrained road capacity is occupied by both passenger and freight vehicles (trucks and vans) such as Manchester and round the M25. Without the construction of new infrastructure (dedicated freight roads) or pricing to move more road freight to off peak, these bottlenecks will remain and grow based on the current-source destination profile in the UK.

g. **The hierarchy of public investment upgrades** in order of best value for money are

#1 Road user charging to incentivise re-timing, route scheduling, modal choice and consolidation

#2= integrated rail freight network development to give both national and international coverage (track, paths and terminals)

#2= mandated consolidation centres at the edge of major conurbations

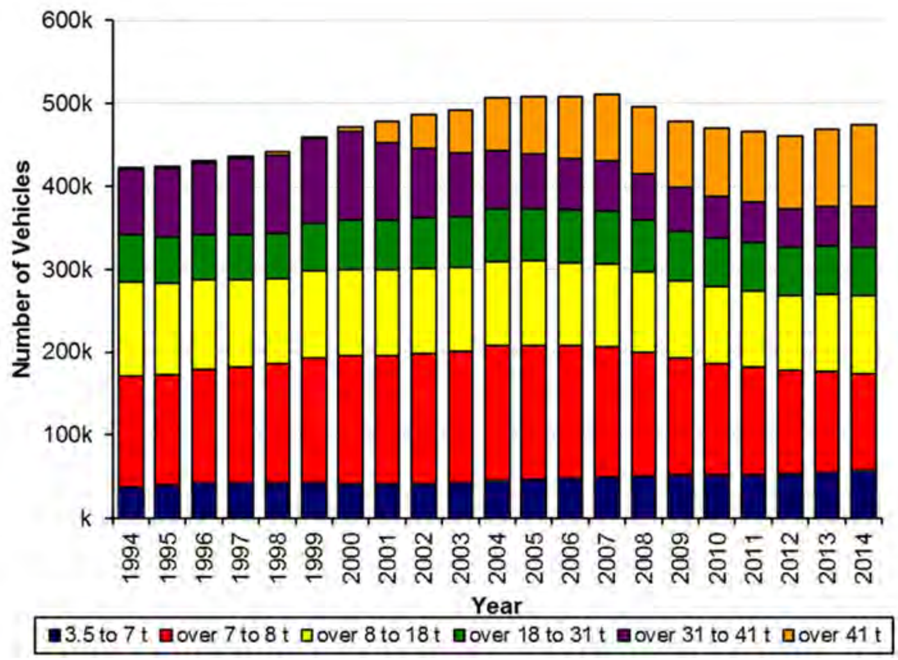
#3 dedicated freight routes on key stretches including freight tunnels and enabling physical internet concepts

h. In response to the question "To what extent are the economic benefits of freight factored into wider transport infrastructure investment planning?" the CILT public policy groups would say 'inadequately and insufficiently'. See the comment on Webtag earlier. It is this realisation that has led to the initiative outlined in 8.g. above.

i. The regulatory and legal issues that will need to be addressed include mandating land use, road user charging and competition law to enable effective collaboration. Existing freight and logistics networks are economically constrained by sub-optimal depot locations, a lack of effective inter-urban <> urban switching points and an inherent aversion to collaboration between operators.

10. The development of demand for freight over the next 20-30 years?

a. **The demand for freight has changed considerably over the last 2 decades**. The net effect has been freight tonne-kms growing less than GDP and the average length of haul increasing slightly. HGV numbers have not increased significantly but the proportion that can haul the heaviest weight has increased within the parc. **SEE DIAGRAM below**. However, more than 70% of the HGV parc is made up of so-called 'rigids' and this mix has not changed significantly in more than 20 years. These vehicles service everything from refuse collection, recycling, radial distribution and animal transport to fuels distribution and construction.



[3] MDS Transmodal Ltd for DfT and Transport for Greater Manchester: The Rees Jeffreys Report on the Major Roads Network

b. **The big trend in distribution structures** has been increasing centralisation into larger distribution centres for sectors such as retail and wholesale. The reduced costs of handling and storage have more than offset the increased road freight miles. Different commodities and sectors have different network structures, length of haul and engage different shares of the HGV parc; there is not adequate information on this and further research is needed.

c. At the same time the growth in the van parc has been well above the rate of growth of the economy as a whole: say 5% to 6% vs 1.5% to 3%. Research published by the RAC Foundation showed that this growth is not primarily attributable to the growth in e-commerce[4]. The range of activities on which vans are engaged is poorly researched but there can be no question that they are an integral part of many supply chains: services, food, retail, construction, wholesale, freight, post and parcel. Work in the London Borough of Barking and Dagenham in 2017 showed that 32% of vans were clearly identified as being involved in services but another 30% was engaged in food, retail, freight, parcels and waste.

d. In the rail sector, the big changes have been the collapse of coal transport and the growth in the haulage of containers from ports to central distribution points. This has been a consequence of the growth in global sourcing. There is no question that the movement of containers from ports to DCs has saved cost, carbon and congestion.

e. In rail there has also been some development of inter-urban freight within the UK but this has been constrained by the lack of a suitable network of terminals and track gauge (bridge height) – CILT consider this is a major infrastructure investment opportunity.

f. **The freight industry planning for future changes in demand** is primarily focused on the growth of e-commerce. At present it is the main driver of the warehousing market both for picking and packing and parcel handling. The associated parcel delivery services are growing at 6% to 9%. Click and collect services are growing by c.30% pa. Nonetheless, the RAC Foundation study showed that e-commerce is not the only or main segment of freight. In relation to these other segments, our experience is that the freight sector has a poor track record of innovation and mostly responds to new markets and technologies[5]: for example, container transport or e-commerce. Once the trend is clear then the industry will get behind the change quickly. Since margins and barriers to entry are low for road freight, this is entirely logical.

g. **Future changes in demand will be shaped by shippers' strategies and public policy.** Shippers' strategies are shaped by (1) their development of new markets and services and (2) their exploration of new facilities, technologies and networks to reduce costs and increase service. They will then tender with the freight industry for the provision of the services. <u>So, the question should be</u> "what are the trends in demand or distribution or technology or policy that will open opportunities for transformation in the economic and environmental performance of freight?" Since the major societal concerns are congestion and emissions and these are in the public domain to determine, government and local authorities will need to do more than regulate and / or invest; there is a need to become actively involved in the consequences of regulation and investment on future structures and hence demand. Otherwise cost and service to the economy will deteriorate; there is no more potent political threat than the nation paying more for its food or going unfed.

h. In this context, the CILT is clear that the combination of policy and investment will shape demand for freight in the future and that must be done in a more joined-up way that ever before. We have been told repeatedly in various consultations and meetings over the last 12 months with the DfT and GO-Science that Freight has been neglected. We agree and welcome this call for evidence; we also point to the poor state of integrated data to identify the real potential for public sector intervention.

i. **In summary, the levers to shape future demand for freight transport will be some combination of**:
   - Freight road user charging (HGV and LGV) and rail track access cost alignment
   - Integrated land use planning and safeguarding key sites particularly in urban peripheries and inner cities

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[4] RAC Foundation, 2017, 'The implications of Internet shopping growth on the van fleet and traffic activity'

[5] DTI (2005) Innovation in the UK: Indicators and Insights, DTI Occasional Paper No. 6, July 2006

- Selective investment in road infrastructure (perhaps with dedicated freight roads)
- Selective investment in rail capacity and gauge height
- Regulations on access, technology use, competition and collaboration

j. **Congestion can have a significant impact on the efficiency of freight movements and emissions.** The efficiency of freight can be measured in terms of the cost per kilo or cubic metre with the latter being more appropriate for most goods. This is derived from the cost resulting from miles covered and time taken divided by the weight or cube of the cargo. If a vehicle is exposed to congestion it will be able to deliver less in the time and hence the unit cost will increase. The tactical response to mitigate the worst effects may be to try to adjust schedules to accommodate endemic congestion or to reduce the vehicle size, perhaps using vans as against HGV. Transport managers are very concerned to maintain reliable service as well as contain costs; as a result, schedules often contain significant safety time, effectively planning for congestion.

k. There is very limited academic material on the cost impact of congestion. One study suggested it may be much higher than the costs quoted for passengers. Quoting from the RAC Foundation report:

   Modelling carried out for a Masters' Thesis at Cranfield University (Liu, 2014)[6] *analysed the impact of congestion on a delivery fleet of 30 vehicles operating in London, in an attempt to test the effect of a reduction in road speeds on the requirement for fleet capacity to undertake B2B customer deliveries. The vehicles were vans with a payload potential of 900 kg being served from a single depot for London. Customers' delivery requirements were quite exacting in terms of the time of day specified for delivery. Simulation showed that the fleet cost and capacity under expected conditions of congestion was roughly double that needed if the vans operated in free-flow conditions. This is a powerful insight into the cost of congestion; for this one company, the cost impact modelled was around £2 million a year. If this was extended across just 15% of the UK van parc the cost to the economy would be around £60bn.*

l. The implication of congestion for HGVs is different. HGVs are unlikely to be despatched at less than 70% full and the slack in HGV routings to accommodate congestion is more likely to show up in unused running time – causing extra vehicles in the fleet as well as wasted hours and wages. Commentary available to the CILT points to transport managers finding that schedule reliability is declining, and they are having to plan for mitigations. This may explain the recent rise in tonne-kms, which had been flatlining; tonnes are not increasing but kms are.

m. **Congestion affects the environmental impacts of the movement of freight**. This is because diesel powered trucks and vans in idling mode are at their least efficient. The air quality maps published in the last year as a result of the Supreme Court case from Planet Earth show that the worst air quality locations coincide with the major congestion pinch-points? Recent papers seen by the institute call into question the viability of the Euro VI engine standard in congested situations.

n. **Better use of the existing urban network by has been effectively flagged by TfL** and is now embodied in the Mayor's Draft Transport Strategy. The core themes are "Combine" and "Re-time". The mayoral strategy has set a target of a reduction by 50% in the number of goods vehicles; this is a serious challenge when volumes and service expectations are still rising which is forcing additional fragmentation. If freight journeys are to be halved for the same demand, then there will have to be some level of mandating consolidation and the provision of facilities (land and buildings) on which to do it. This takes our response back to land use planning, mentioned earlier. In cities like London, there are opportunities to use the river, bicycle logistics, passenger train terminals off peak, freight tubes and a range of other innovations. These will only ever have a partial impact across the whole of the freight spectrum. In our opinion it is naïve to expect magically that consolidation will occur without proactive intervention for which there is currently no political precedent.

11. How can freight lower its carbon and air quality impacts?

a. The answers to this question depend on whether freight is inter-urban or urban.

b. For long distance inter-urban freight, the options (not mutually exclusive) are:

[6] Liu, K. (2014). Evaluating the True Cost of Road Congestion for Road Freight Operators. Master's Thesis. Cranfield School of Management.

- Move more freight to rail which is environmentally much more efficient – but this requires a comprehensive terminal network and service
- Move the truck fleet away from diesel to alternative fuels such as CNG (truck makers are experimenting with large electric powered HGVs and these may become viable with advances in technology)
- Increase consolidation and return load movements to reduce trucks on the road – this only applies to a part of the parc as many truck applications are not interchangeable and cannot find return loads
- Re-design supply chains to eliminate complete legs in the chain using digital technology to consolidate the final delivery in real time through edge-of-urban facilities. This point can only operate with a new model consolidation approach, mentioned earlier

c. For urban movements, the CILT expects that EVs (HGV and LGV) will be the big trend. These may be supplemented by hybrid or alternative fuels. The reduced range of EVs will require consolidation into urban areas based on edge of town, taking us back to land use yet again.

d. The barriers to the adoption of these vehicle technologies are, first, the distribution of fuel and charging points. Grid capacity in London is limiting (probably more widely) at present and alternative fuels are narrowly available. Second, the payload certification of EVs needs to be changed to avoid the loss of effective carrying capacity.

e. The availability of proven vehicles in volume production is also a major constraint.

f. As is the handing of privacy, confidentiality and competition concerns in the event of consolidation initiatives.

12. How could new technologies be utilised to increase the efficiency and productivity of UK freight?

a. The CILT response to the NIA said: *'Significant social and technological research is needed before any decisions are taken on the future role of radical new technologies in the transport system. This should include understanding fully the implications of operating connected and autonomous vehicles – especially HGV's – on motorways and trunk roads, including the effects on safety, congestion and modal split. We do not agree with the NIA's view that platooned lorries could largely replace rail freight and consider that this would have strongly adverse impacts on congestion, capacity and carbon emissions. Further, platooning of HGV's does not reduce the number of lorries required and is thus not a solution to congestion - it could make emissions worse if, by making road more competitive, it took traffic off rail.'*

b. In this context, **new technologies have the potential to transform the capacity and performance of the freight transport network**.

- Digital railway signalling

  The Digital Railway will allow more trains to use a given route and needs to be accompanied by improvements to key nodes/junctions on the Network. This will often involve grade separation to eliminate conflicting moves - Reading provides an excellent example of what can, and should, be done elsewhere. Dynamic loops are needed on busy 2-track sections to allow passenger trains to overtake freight trains on the move, thereby saving energy and allowing more efficient use of capacity. Strategically, capacity released on the WCML from 2025 by the transfer of inter-city passenger services to HS2 needs to be ring fenced for additional freight volume - WCML is the key artery for consumer goods, connecting virtually all the major ports, distribution clusters and centres of consumption. This will also apply to the MML and ECML from 2033 when HS2 Phase 2 is commissioned - capacity on the MML is needed for more aggregates trains from Leicestershire to the South East and on the ECML for intermodal services from Felixstowe.

- Intelligent roads including ANPR, road user charging and capacity management

  Intelligent roads can provide support for capacity management both in immediate measures such as use of extra lanes and signage on incidents. Sensors could be integrated with digital capabilities in vehicles (to a greater extent than at present) providing reactive driver routing advice. Such facilities would also be a platform for road user charging. The proactive use of big data to predict route viability will also be applicable, guiding operators as to when to set out and the routing to take; this could be linked to differential road charging which would enable proactive capacity management.

- Connected (not necessarily autonomous) vehicles

  Many commentators are excited by the prospect of platooning of vehicles on inter-urban routes. CILT recognise the potential to increase capacity by tightly connecting vehicles on the motorways but more sceptical about the safety of full autonomy in a UK context with many motorway junctions and during transition with other users not connected. Also the economics of freight will not be hugely improved while a person is still in the cab and that will be another barrier to adoption.

  The potential to connect vehicles so that flows can be synchronised and more tightly coupled with increased safety seems more immediately attractive than full autonomy.

  In the urban situation, CILT is also cautious over the adoption of autonomous urban delivery technologies. Fist the vehicle will mostly continue to need a driver to load and unload; second the mix with conventional traffic and pedestrian movement can be problematic. In any event designated parking areas or fully developed servicing plans will be needed; that once again brings our commentary back to land use and planning.

- Connected cargoes

  The potential to connect available cargoes across the widest possible network offers exciting potential with fewer dependencies. The use of big data to enable cooperative consolidation and backhauling can reduce urban delivery vehicles and to increase delivery efficiency. This could work on a short term reactive mode as well as using the data for longer term proactive traffic pattern matching. This is about one cargo and carrier being able to see and bid for (or place with) others' traffic. The barrier will always be revenue defensive behaviours by carriers, which is why the CILT expect that some degree of public intervention will be needed.

c. **None of these new technologies can operate independently of the physical infrastructure** and there are technological developments here too (more prosaic and mostly possible today, but nonetheless central to improved performance):

- Longer freight trains

  Bigger Trains - longer trains (minimum 750m, with a target of 1000m - France is experimenting with 1500m trains) and heavier trains (3500t minimum, with a target of 4000t) allow better use of capacity and make rail more efficient and thus more competitive. This can be achieved by progressively removing infrastructure constraints that limit train size and by the introduction of more powerful electric locos. The heaviest trains of aggregates and other bulk commodities will probably continue to operate mainly at night, away from passenger services, with the empty trains returning to the quarry etc after the morning peak - at 75mph they are able to keep up with all but express passenger trains.

- Advanced automated cross dock, transhipment and consolidation handling systems and facilities

  A project with the Transport Systems Catapult and Transport for Greater Manchester developed a feasibility assessment of large scale fully automated consolidation centres. This work confirmed the opportunity and pointed to a range of uncertainties and dependencies. Technically it is possible, and the economics look close to breakeven, but the detailed design and viability will be subject to careful operational scheduling.

  Rail has similar issues and there is an urgent need for easier connection into the rail network - a quicker and cheaper process of connecting into the national Network is required. One company alone has around 10 locations situated next to railway lines and could move an additional 1-2m tonnes p.a by rail if connections were available; but the costs and time of doing so are prohibitive under current arrangements. Digital railway should help, but this needs to be tested, and design/approvals timescales need to be considerably shortened.

- Electrification of the rail freight network and HGV/LGV capacity including the use of fast charging pantographs

  In rail freight, the UK lags way behind the rest of Europe in electric haulage of freight trains. However, almost 2/3rd of UK rail freight could be fairly readily converted to electric haulage, including virtually all intermodal and automotive trains, along with most construction services, if a little over 300 miles were electrified. This is mostly made up of sections between, or extensions to, already-electrified passenger routes - the one completely 'new' route would be Felixstowe to the West Midlands, connecting to both the ECML and WCML en route, which alone accounts for over half the 300 miles. In due course further 150 miles might be required as diversionary routes. A new breed of heavy-haul electric freight loco (with a fuel cell/battery 'last mile' capability) will be required to replace the current diesel fleet, which will be approaching the end of its life in c.15 years time - design work on this should start now. In the shorter term, overhauling and restoring to service the existing pool of electric locos, plus taking into freight use those shortly to be displaced from passenger services, would probably be sufficient to handle approaching half the freight moved by rail in the UK, if the 300 or so miles were electrified and freight operating companies were incentivised to do so.

In the road vehicle segment, the opportunity to electrify was discussed earlier. City environments will require pantographs and induction charging as well as fixed charge points. The payload plating regulations of EVs also need to be revised to enable economic payloads.

d. **New technologies change the capacity and performance of the freight transport network simply by:**
    - Increasing the utilisation of road and track space
    - Reducing the journeys made or distance / time taken for the same payload
    - This can work on a reactive basis (what do I do next?) or a proactive basis (how do I design this in terms of flow, movement, consolidation?)
    - Improving the environmental effectiveness of the movement.
    - It is worth pointing out that autonomy will lower journey costs to the extent that some shippers may reduce payloads and increase shipping frequency; this will cause autonomous vehicle congestion

e. The timeframes for new technologies to begin to affect the freight transport network will depend on how quickly a viable integrated network is put in place. e.g.
    - Long electric freight trains are useless without terminals
    - Urban consolidation centres only work when they have a good supply of viable EV's to do the final delivery and consignees have signed up for the scheme

f. **The use of data such as real-time traffic information by artificial intelligence and machine learning systems** can help to improve freight efficiency and productivity but possibly not as much as some expect. Many traffic segments are not interchangeable between vehicles so the available pool of opportunity is often over-stated.

g. **The evolution of new business models to meet the requirements of freight in the future** will be critical and there are some significant barriers to their adoption. The Transport Systems Catapult report covered some of these details.

h. **The interaction of regulations and physical infrastructure** will need a new public and private mindset.

13. Are there good examples internationally of freight systems, policy, infrastructure or technology development and implementation that the UK can learn from to increase freight efficiency and/or reduce the carbon and congestion impacts?

a. The example of Singapore seems to be highly relevant. They have a universal ERP system (Electronic Road Pricing) that applies to trucks and cars and buses. The pricing mechanism has been used powerfully to change personal travel practice and the use of freight. It has been done with integration of public transport. The important thing to note is that this levies different charges at different times of day and location.

b. In the UAE, trucks are banned from operating at peak hours.

c. In China and other countries there are assertive moves to ban polluting diesel trucks and also during commute times.

d. It appears that different countries are proactively limiting access of all vehicles using some combination of hard restrictions (for example by fuel type and registration plate) and pricing measures. The technology is available based on ANPR and Dart systems, in some cases integrated with telematics.

14. In summary….

a. Government's current ambition to modernise the trunk and major roads networks, together with a mandate to focus on freight infrastructure, provides a generational opportunity for new models for freight and logistics. They must address the simultaneous needs of improving national productivity and reducing freight's impact on the environment and congestion.

b. Structural changes in supply chains, arising from Brexit, alongside the pressing issue of air quality provide a platform of urgency to create new operating models for freight and logistics.

c. Infrastructure investment will be funded by both public and private sectors; it is crucial that there is a shared vision of possible end-states and that programmes are brought through in a coordinated way – embracing new technologies and dealing with the real barriers including land use, regulation and governance detailed in this response.

Submitted by:
[Name redacted]
[Job title redacted]
The Chartered Institute of Logistics and Transport
[Email address redacted]
[Telephone numbers redacted]

March 2018

RAC Foundation

Mobility • Safety • Economy • Environment

RAC Foundation's Response to the National Infrastructure Commission:

Freight Study – Call for Evidence, March 2018

1. Introduction

The RAC Foundation is an independent transport policy and research organisation which explores the economic, mobility, safety and environmental issues relating to motoring and road use. We are happy for our response to be published in full.

The Foundation responded in August 2016[1] to the Commission's Consultation on The National Infrastructure Assessment Process and Methodology[2], in February 2017[3] to the Commission's Consultation on National Infrastructure Assessment Call for Evidence[4] and in January 2018[5] to the Commissions Consultation on Congestion, Capacity, Carbon: Priorities for National Infrastructure: Consultation on a National Infrastructure Assessment[6].

The Foundation welcomes the opportunity to respond to the Commission's latest consultation (NIA) and, as in previous responses our response concentrates on roads and road-use in particular. However, we recognise that the national freight system is multi-modal and that road freight must be considered in the context of the wider arena of logistics and the roles of water, rail, pipeline and air transport.

Specifically on road freight, it bears stating by way of introduction that the current pattern of freight movements is predicated on the UK having an extensive, well-developed road network. Axle weight is a key factor in the wear and tear imposed by vehicles on the network ergo the strategic road network, which carries a disproportionately high volume of freight movements, is likely to require carriageways built and maintained to a higher – more expensive – standard than other roads. But maintenance of the remainder of the network is also a matter of concern. We would like to see the government's recognition of the Major Road Network – roads of national or regional significance not currently badged as 'strategic' should extend to maintenance as well as potential funding for enhancement.

Secondly, as a broad generalisation, crashes involving heavy vehicles tend to be more serious than those only involving cars. More serious for those involved, and more serious in terms of the ensuing delays. Ruptured diesel tanks lead to carriageway damage that

[1] RACF 2016.
[2] NIC 2016a.
[3] RACF 2017b.
[4] NIC 2016b.
[5] RACF 2018.
[6] NIC 2017.

requires resurfacing before lanes can be re-opened. We would argue that more work is needed to understand the causes and impacts of crashes involving heavy vehicles (as, indeed, we would say is the case for all road crashes[7]) in order to identify opportunities to reduce the incidence and mitigate the impact of these incidents.

2. The wider picture

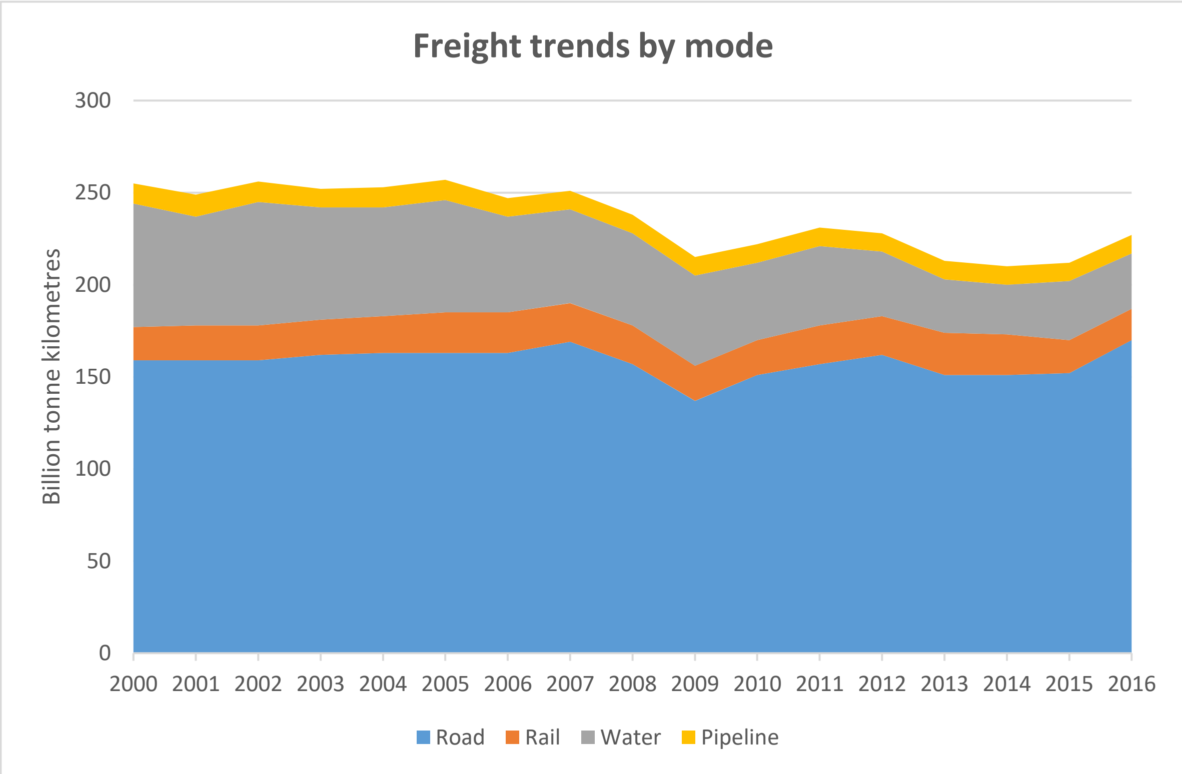
The movement of goods comprises a range of types of activity from a simple transfer of material from its source to a processing plant at one extreme to a link in a complex production chain, where transport issues are necessarily subordinated to a principle industrial or commercial process. This often means that freight transport has to be addressed in its setting as part of a complex process including routes, terminals and storage; the roles and capabilities of each mode in its own right and as part of a multi-modal system and the particular requirements of the economic sector which it serves.

Transport by road has a range of characteristics which make it particularly suitable for inland domestic freight in Great Britain both in its own right and as major player in multi modal transportation. This wider picture of the UK freight industry was covered comprehensively in the DfT's publication 'Focus on Freight' in 2006[8] although this is now rather out of date.

Figure 2.1 shows recent trends in domestic freight movement. Since 2000 there has been a decline in freight traffic – principally as a result of reduced water transportation. Waterways carry scarcely any internal traffic and the reduction of traffic between UK ports and from offshore sources has shrunk with the decline of the North Sea oil activities[9]. As shown in Figure 2.3 there has been little change in rail freight over this period but the mix of traffic has changed - with a large reduction in coal shipments and significant increases in construction and container traffics. This is expected to form the continuing trend over the next two or three decades[10] and the infrastructure options needed to accommodate this has been set out by Network Rail[11].

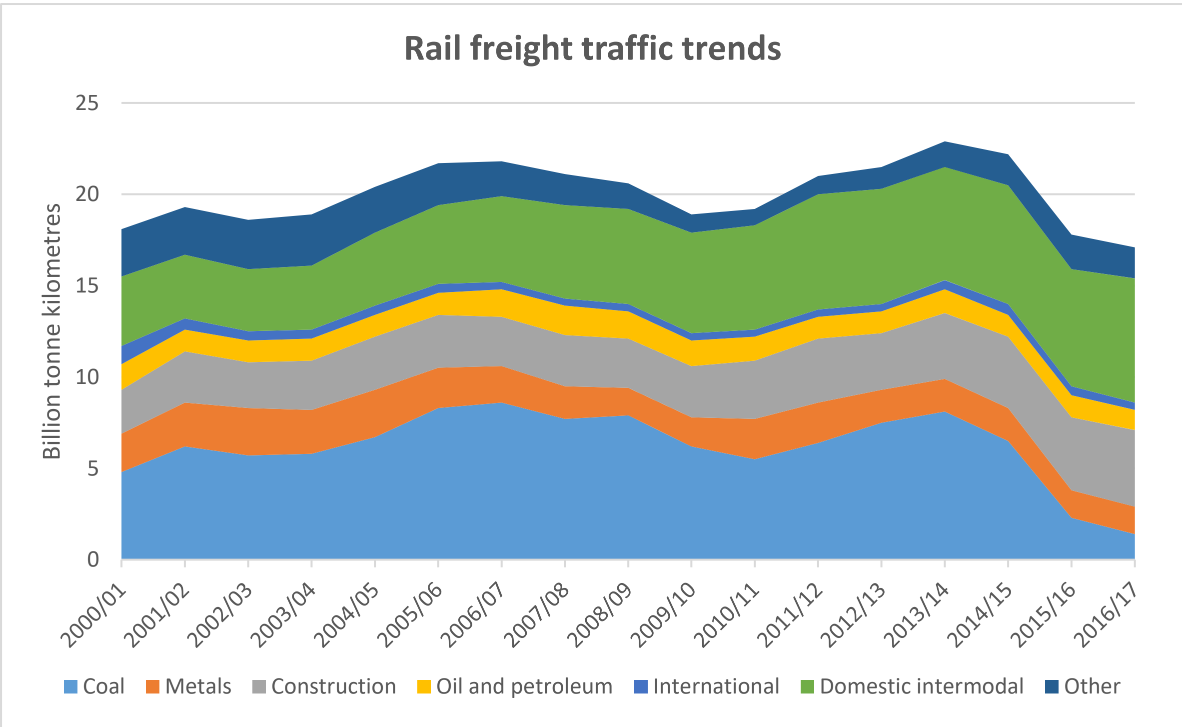
[7] RACF 2017
[8] DfT 2006b.
[9] OGA 2018 (60% reduction between 2000 and 2016).
[10] Network Rail 2013.
[11] Network Rail 2017.

Figure 2.1: Freight traffic trends by mode 2000 – 2016 (Billion tonne kilometres/year)



Source: DfT 2017a.

Figure 2.2: Rail freight traffic trends by type of traffic, 2000/01 – 2016/17 (Billion tonne kilometres/year)



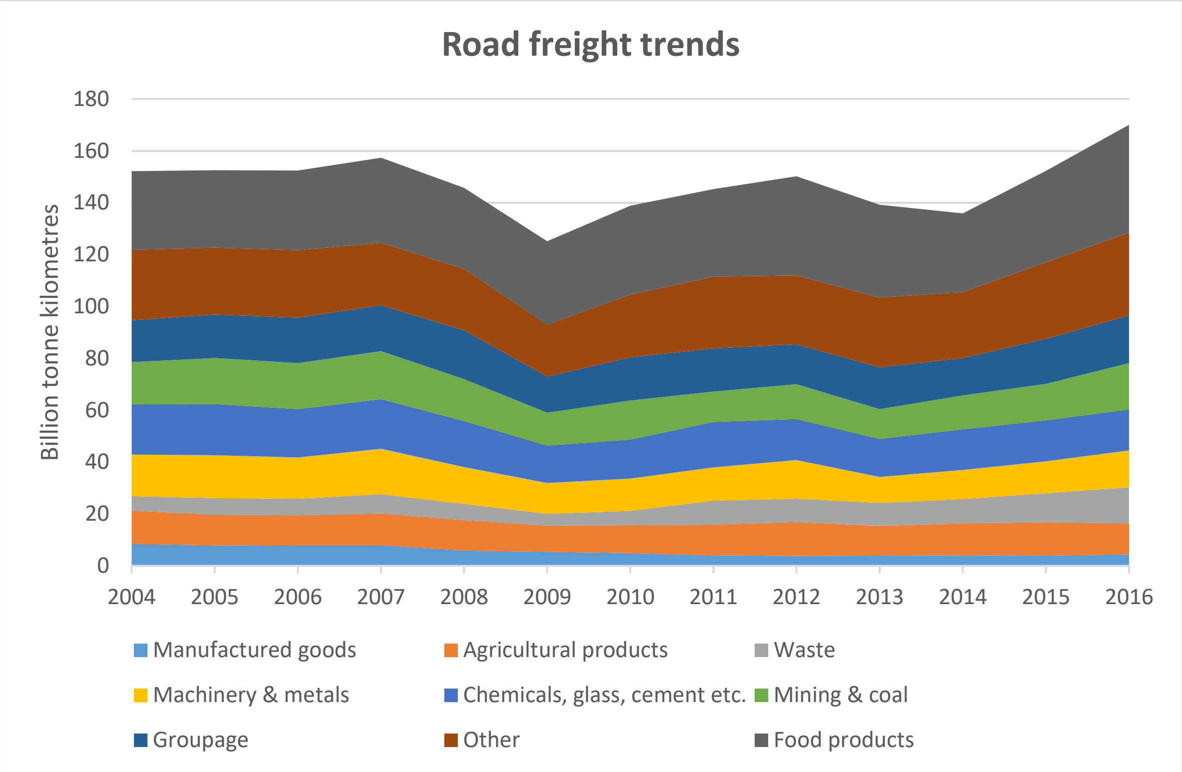
Source: DfT 2017d.

Road freight is now 7% greater than in 2000 although it fell to 20% below its current level in 2009 - illustrating just how sensitive it is to the state of the economy. To a lesser extent the

3

other modes' usages are linked to the fortunes of particular industries. Figure 2.3 shows the wide range of types of goods shipped by Heavy Goods Vehicles (HGVs). In addition to this a great deal of light freight is shipped by vans which carry equipment to and from worksites as well as making deliveries to commercial and increasingly domestic premises[12,13].

Figure 2.3: Road freight trends by type of traffic 2004 – 2016 (Billion tonne kilometres/year)



Source: DfT 2017e. (Groupage are combinations of small consignments usually of finished & semi-finished goods).

Vans mainly make fairly short journeys (average journey length less than 20 miles[14]) and, as such, mostly use local roads with just one third of van traffic is on the strategic road network (motorways and trunk roads)[15]. Lorries on the other hand are heavily dependent on the strategic road network (which carries two thirds of lorry traffic[16]) with average journey lengths of 56 miles. Whilst being the dominant inland freight carrier, the Freight Transport Association notes [17] that of the UK's transport infrastructure, roads are the least competitive ranking 27th internationally compared with rail at 19th, air at 18th and ports at 12th.

12 CfIT 2010.
13 Braithwaite 2017.
14 CfIT 2010.
15 DfT 2017f.
16 Ibid.
17 FTA 2017.

Whilst air transport plays a significant role in the carriage of international freight, its role in domestic freight is confined to small belly-hold shipments of high value goods transported to and from airports almost exclusively by road.

3 Specific Questions

Not all questions in the consultation paper have been addressed as there are some issues on which the Foundation is not in a position to give a well-founded view.

What do you see as the key drivers to a successful freight system that is fit for the future?

An efficient freight system for the UK requires:

- A regulatory regime which secures a competitive framework for all modes and types of operation yet provides the necessary environmental protection
- A healthy logistics industry in which shippers, carriers and TPLMs[18] all play their complementary roles
- Infrastructure (routes, terminals and communications) which enables the capacity and quality of service each type of freight operation requires
- A pricing and taxation regime which does not distort markets except to remedy market failures and mitigate externalities such as pollution and congestion.

Which are the key freight corridors that matter the most? Where are the bottlenecks in the freight network, and what investments in upgrades could deliver the best value for money for freight efficiency and UK plc?

The most important road freight corridors are those which carry heavy volumes of commercial vehicles (HGVs and vans). The Department for Transport published data on traffic flows[19] which includes tables and an interactive map of traffic volumes on individual roads[20]. Highways England also publishes traffic flow and journey times in which vehicles longer than 6.6 metres are separately identified[21]. In a study carried out by Quarmby and Carey for the Rees Jeffreys Road Fund[22], an English Main Road Network (MRN) was identified which was significantly longer than the current trunk road network (8,000 miles compared with 4,200 miles). More recently the DfT has identified and even larger MRN at about 5,000 miles longer than the trunk road network[23].

Apart from the border between Northern Ireland and the Irish Republic there are no international road connections to and from the UK so the road freight system must be well connected to international portals – maritime, the Channel Tunnel and air services. The main freight airports are London's, East Midlands and Manchester which respectively carry

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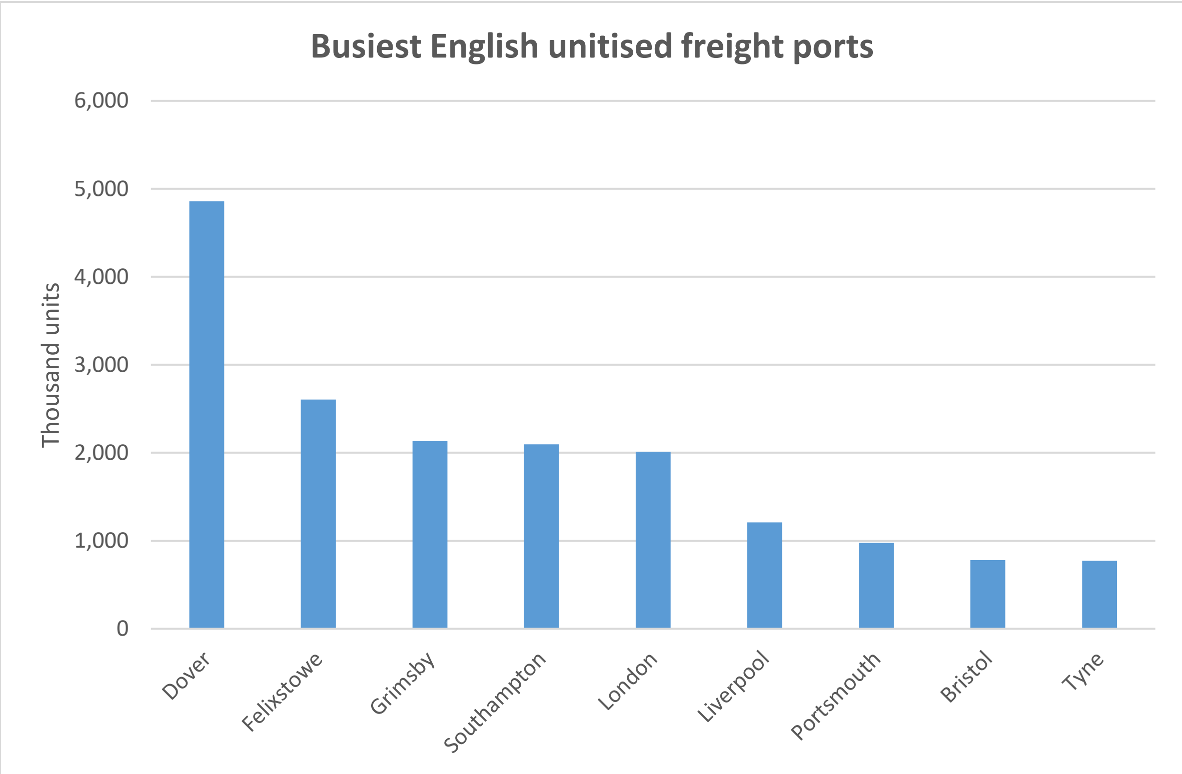
[18] Third Party Logistic Managers.
[19] DfT 2018a.
[20] DfT 2018b.
[21] Highways England 2018.
[22] Quarmby & Carey 2016.
[23] DfT 2017g.

75%, 12% and 5% of the roundly one million tonnes of air freight lifted annually[24]. The main unitised freight seaports are shown in Figure 3.1. These carry over 90% of unitised traffic – which includes some rail and barge units but is overwhelmingly one or other type of lorry movement. In addition, the Euro shuttle services carried 1.64 million lorries between England and the Continent in 2016.

Figure 3.1: Eight busiest English unitised freight ports 2016.



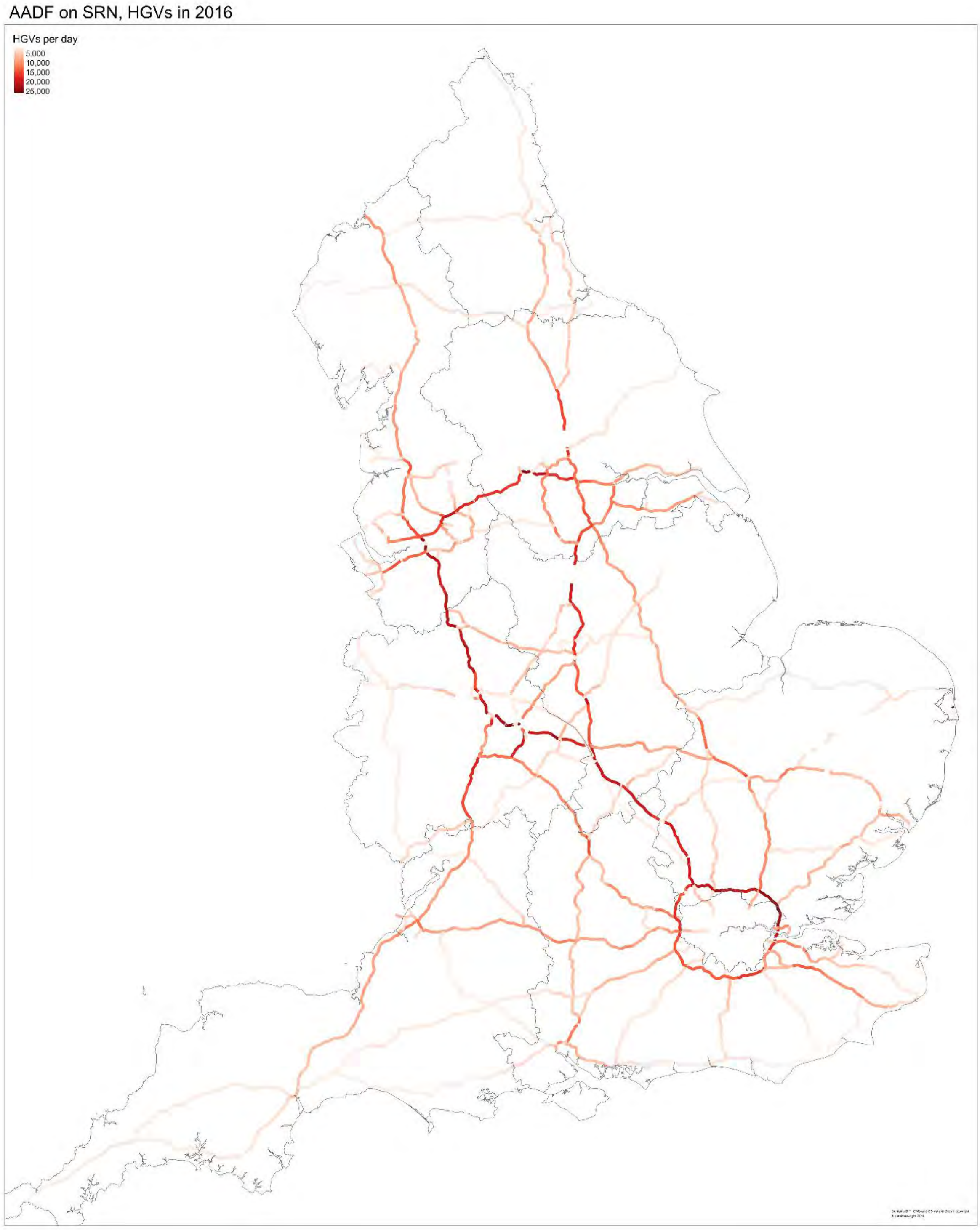
Source: DfT 2017j.

Figures 3.2 and 3.3 show van and HGV flows on the Strategic (trunk) Road Network in 2016. The location of the most severe congestion sites can easily be established from the sources identified above and Figure 3.4 shows the present and prospective congestion on the Strategic Road Network. Not surprisingly the M1, M6, M25 and M62 stand out but the influence of the ports of Dover, Southampton, Felixstowe and Hull are also to be seen. Whilst goods traffic is not necessarily the main cause of strategic road congestion, the coincidence between the most congested roads and those on which freight transport is most dependent means that the prospective worsening of road congestion will have particularly severe consequences for the movement of goods.

The road investments that will provide particular benefits for freight are those that eliminate physical restrictions requiring diversions from the shortest routes and those which reduce delays, and particularly improve journey time reliability, on routes heavily used by commercial vehicles.

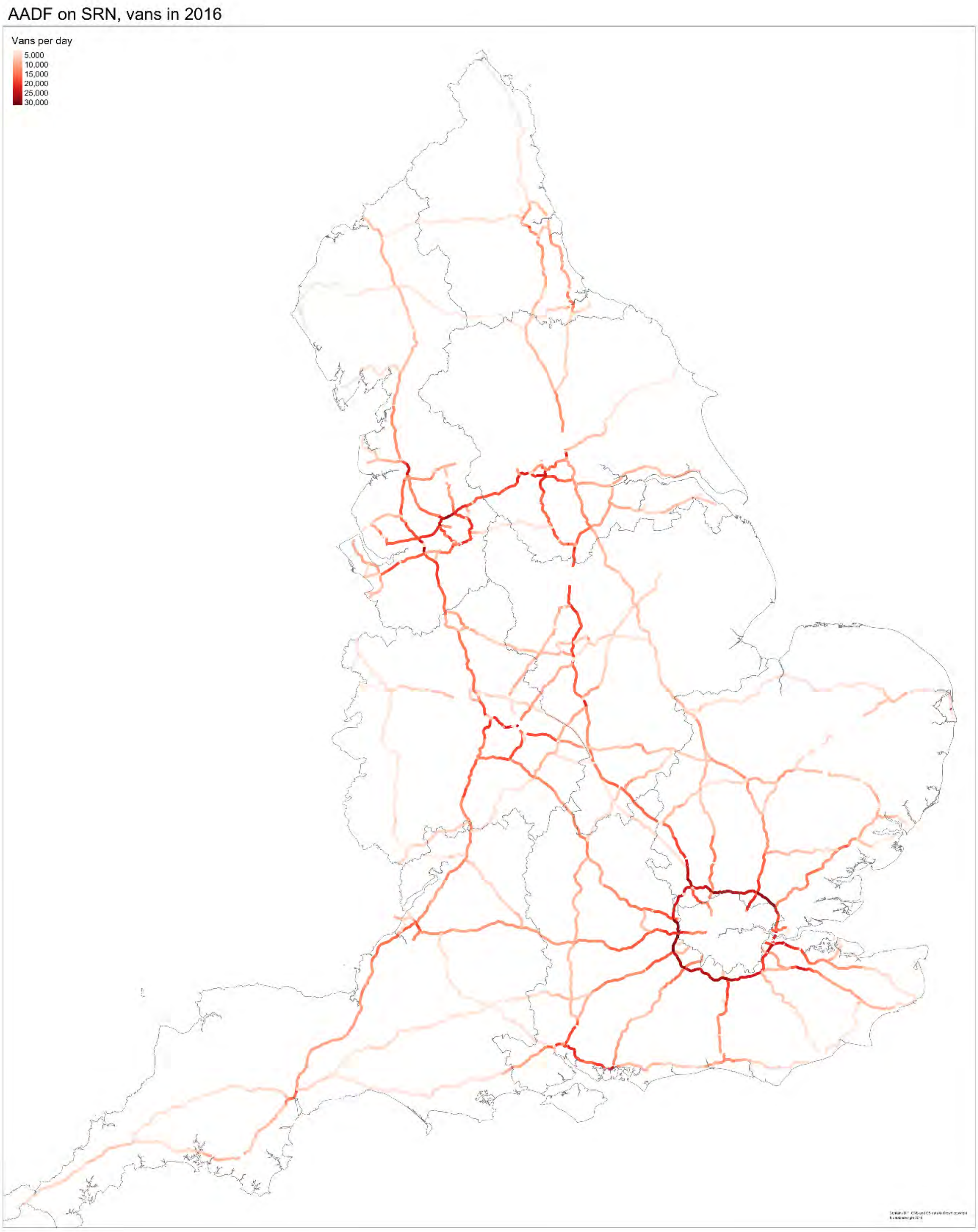
[24] DfT 2017i.

Figure 3.2: Lorry and flows on the Strategic Road Network 2016



Source: RAC Foundation using Highways England data.

Figure 3.3: Van flows on the Strategic Road Network 2016

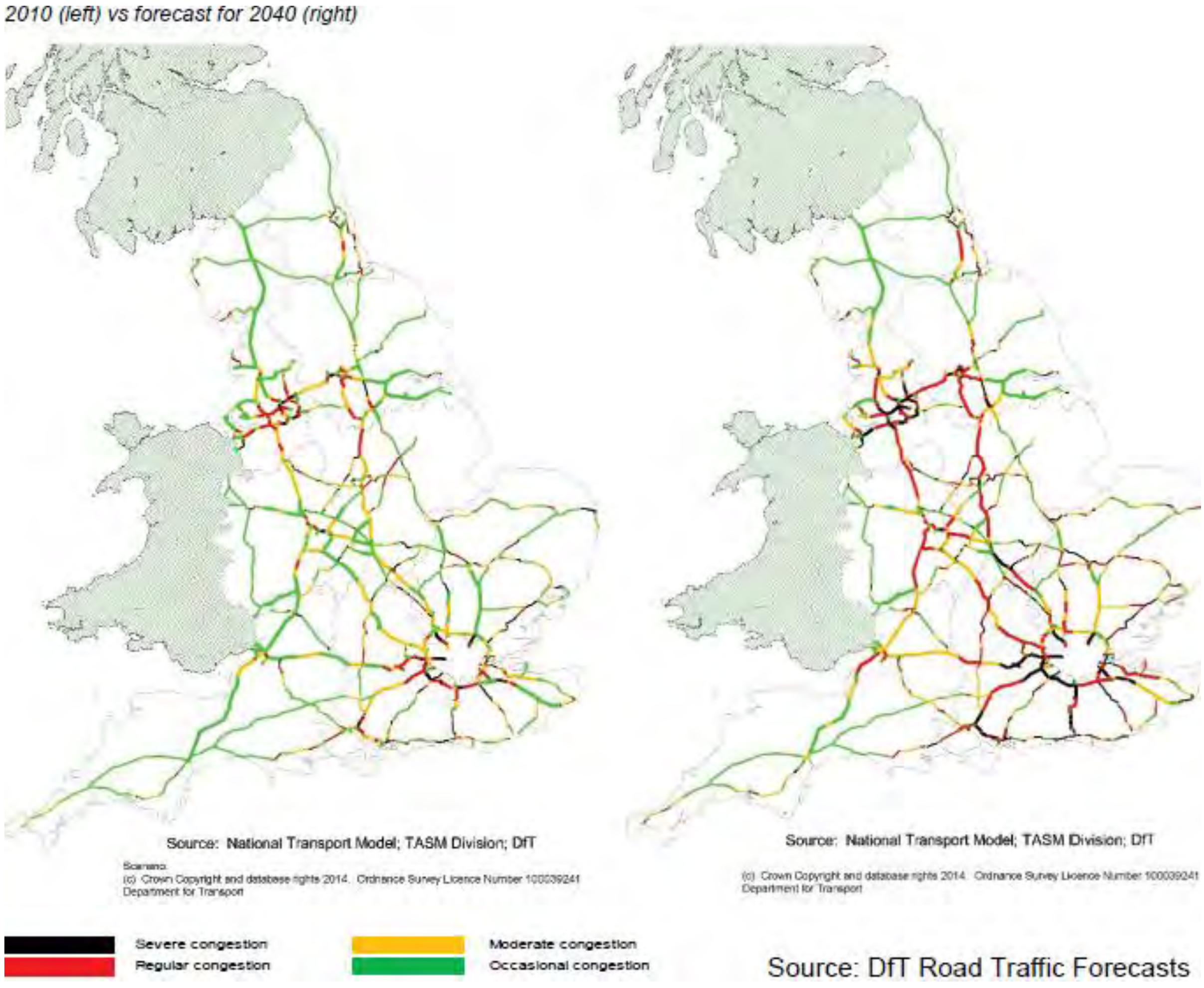


Source: RAC Foundation using Highways England data.

To what extent are the economic benefits of freight factored into wider transport infrastructure investment planning?

Current transport appraisal methods incorporate benefits to road freight as part of overall evaluations by considering the high proportion of working time by vehicle occupants, higher fuel consumption rates of lorries, higher vehicle operating costs[25]. However, they do not always consider the costs of coping with extended and unreliable travel times - which can require higher inventory costs and significant buffer times in delivery schedules to achieve the levels of service required in a modern economy. It has been estimated that of the total £307bn costs of road congestion between 2013 and 2030 £115bn (37%) will be due to these indirect effects.[26]

Figure 3.4: Strategic Road Network congestion 2010 and 2040 (forecast)



Source: DfT 2015.

[25] DfT 2017l.
[26] CEBR 2017.

What are the regulatory and legal issues that, if changed, could improve freight efficiency without increasing costs or reducing efficiency?

The freight *market* in the UK has been only lightly regulated since the removal of the post WWII quantitative licensing system by the 1968 Transport Act[27]. However, road transport *operations* are heavily regulated and operators of vehicles over 3,500kgs must be licensed, vehicles have to be safe, meet prescribed environmental standards and be well maintained and drivers are licensed. Drivers' hours are also controlled. Whilst road freight costs could be lowered somewhat if these regulations were eased, by and large they are reasonable on health, safety and environmental grounds and there is no case for a substantial change.

Lorry traffic is also subject to a range of road traffic regulations such as height and weight restrictions which disproportionately affect HGVs and easing these by infrastructure improvements would increase freight efficiency. Also the increasing stringency in environmental standards for road transport operations bears heavily on commercial vehicles with their near universal use of diesel engines. It has been estimated that the introduction of clean air zones in line with government policy, although producing substantial net benefits, would incur fleet adjustment costs of roundly £1bn of which £455m would fall on businesses[28].

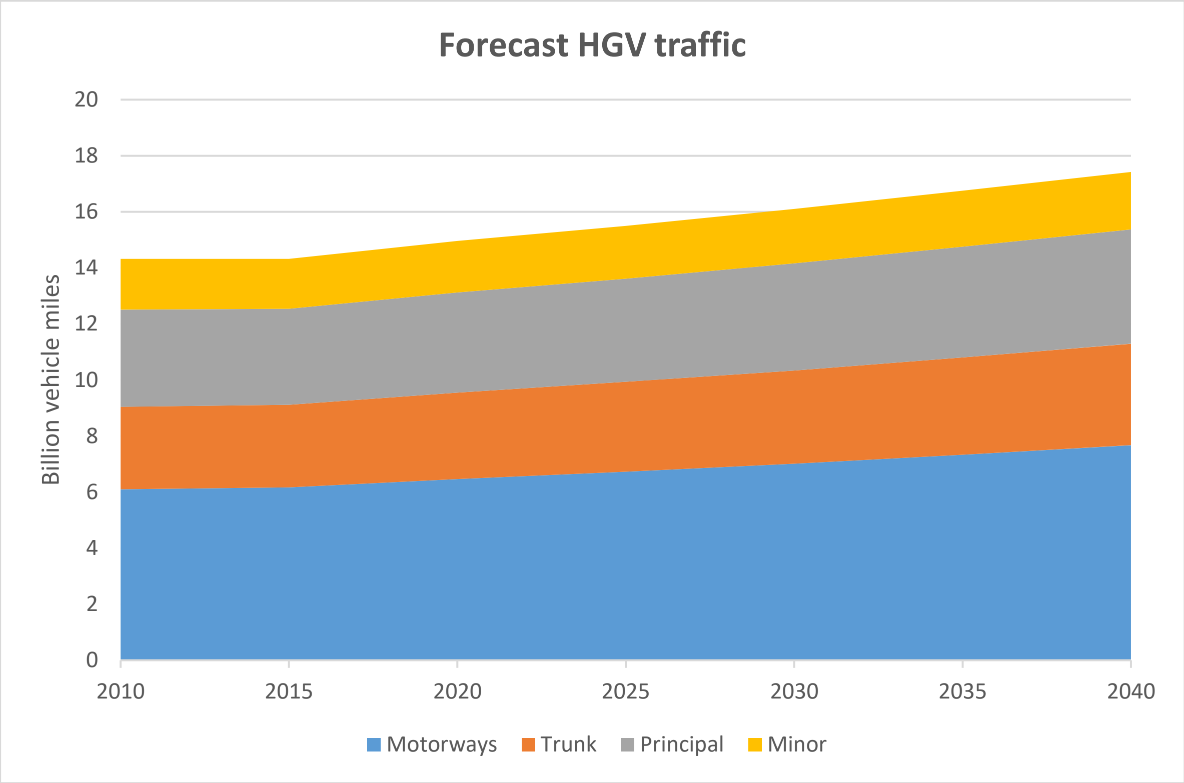
As well as regulations, the tax regime has implications for the efficiency of the freight sector. Road freight operations pay significant sums in transport taxes whilst the rail sector pays relatively little. HGVs payed £290m in VED in 2016/17[29] and vans about £600m[30]. Of the £27.9bn paid in fuel duty in 2016/17 £9¾bn was came from lorries and vans[31] (GB Figures). Some rail and waterborne operations also received subsidies in respect of the lorry movements they were estimated to remove from the road system. For 2015/16 these amounted to £20.6m[32]. So the road freight sector suffers both higher tax and congestion costs than rail or waterborne freight.

How might the demand for freight develop and change over the next 20-30 years

The Foundation is not in a position to provide guidance on this matter except to point to the work done for the Department for Transport by MBS Transmodal[33] and an initiative by DfT/WSP back in 2007[34]. These are reflected in the National Road Traffic Forecasts illustrated in Figures 3.4 and 3.5. Scenario 1 is used as this represents a central macro-economic growth estimate, historic trip rates and a declining income effect on traffic generation. Of note are the continuation of motorways as the major carrier of HGVs and the forecast large growth of van traffic on local authority roads.

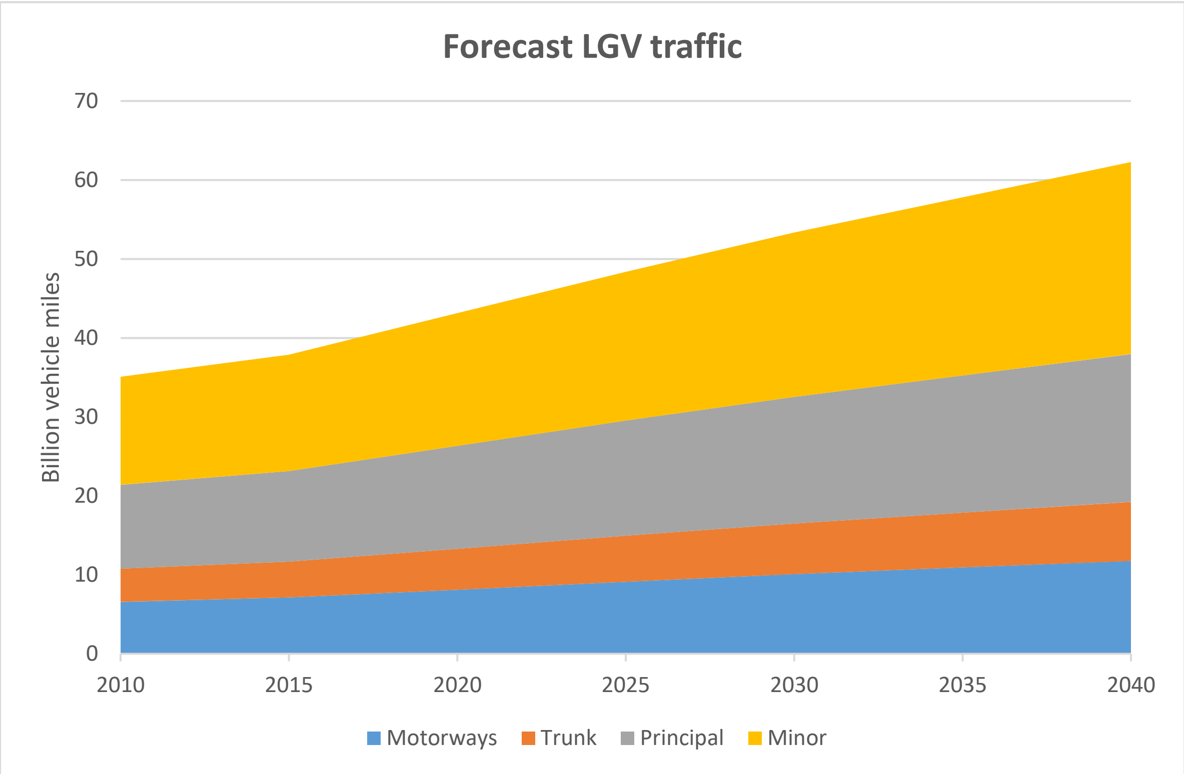
[27] Transport Act 1968, chapter 73.
[28] DEFRA 2016.
[29] DfT 2017m
[30] DfT 2017n & 2017o.
[31] DfT 2017m & DBEIS 2017.
[32] DfT 2017p.
[33] MDS Transmodal 2018.
[34] WSP 2007.

Figure 3.4: English HGV traffic forecast (Scenario 1) by road type 2010 – 2040



Source: DfT 2015.

Figure 3.5: English LGC traffic forecast (Scenario 1) by road type 2010 – 2040



Source: DfT 2015.

How has the demand for freight, and types of freight, changed over the last two decades, and what will be the drivers for changes in the future?

Figures 2.1, 2.2 & 2.3 identify key freight trends over recent years and identify statistical sources. However, they do not show the rapid growth in van traffic with a 70% increase in the last twenty years and a doubling since 1989[35]. Insights into the use of vans are given in DfT 2004, DfT 2006a, Clarke et al 2010 and Brathwaite 2017.

Future freight demand is likely to be affected by the consolidation and growth of the economy around service functions, the introduction of technologies that will increase automation, including – potentially - lorry platooning - on motorways at least. Whilst the use of drones for deliveries is being trialled it seems most probable that this will be limited to niche low weight/high value products. Improvements to diesel engine characteristics should mean that lorries are less objectionable in sensitive areas than at present (noise reductions have already been substantial[36]). In the case of vans the increased use of electric and hybrid technology offers the prospect of quiet, emission free operations making evening and night time deliveries more acceptable and the application of connected and autonomous vehicles making these economic.

It is also possible that more dispersed patters of activity, enabled by high quality electronic communications, will result in a less well-defined pattern of freight origins and destinations coupled with smaller and more frequent shipments. However, the structure of the economy could be affected by the new trading regime following the UK's exit from the European Union and the balance between service and manufacturing may change.

What effects does congestion have on the efficiency of freight movement and emissions?

Congestion is a major drag on the efficiency of road freight. It extends journey times, impairs reliability, increases fuel consumption and can be a source of stress for workers in the industry. An estimate of the costs of congestion to road freight was made in the 2006 Eddington Study[37], this represented between £400m and £500m currently at today's prices (excluding indirect costs). More recent estimates of the costs of congestion, based on actual measurements in September 2016, project this to be £61.8bn in 2025 for all traffic[38]. If freight traffic experienced its share by proportion of vehicle miles[39] (probably an under estimate) this would amount to £12.3bn.

Congestion also less smooth traffic flow which in turn increases vehicle emissions. Figure 3.6 illustrates this for a heavy diesel engine vehicle.

When speeds drop below 30kph emissions start to rise progressively and at 10kph have more than doubled. As more stringent emission standards come in and are implemented across the parc then this problem becomes less severe and the figure shows the expected effect as these are the proportion of the more heavily polluting vehicles is reduced. Over

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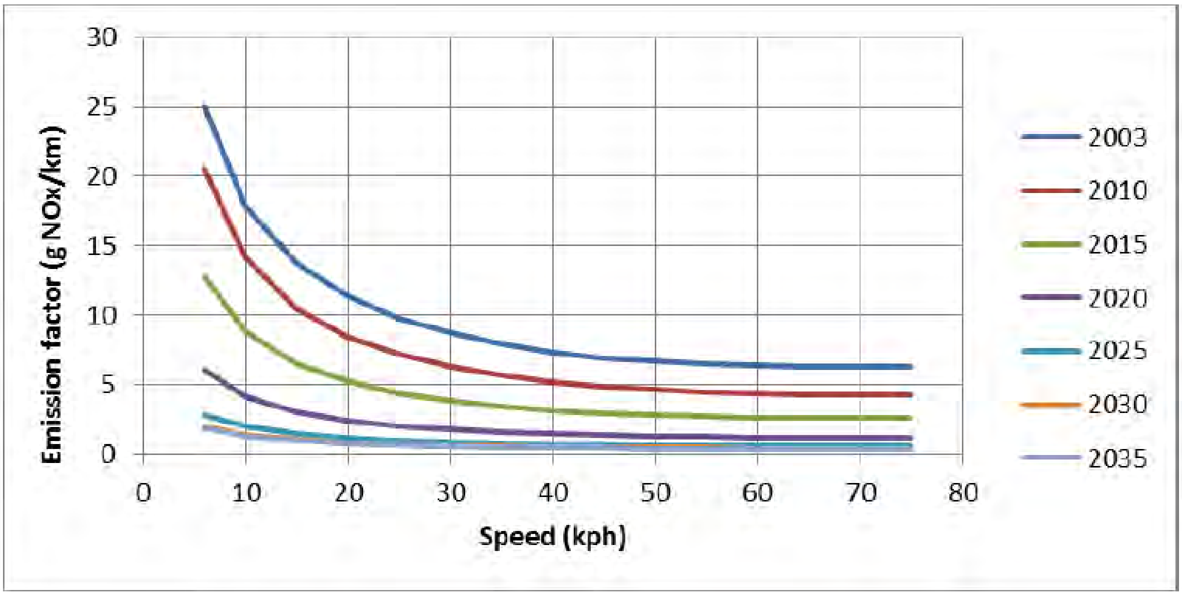
[35] DfT 2017q.
[36] EAMA 2018.
[37] Eddington 2006.
[38] INRIX 2016.
[39] DfT 2015.

the last six years the average annual replacement rate for HGVs has been 9.64% and the progressive introduction of clean air zones will provide added incentives for the retiring of the worst polluting vehicles.

Figure 3.6: Illustrative NO_X speed emissions curve for heavy diesel vehicle 2003 – 2035



Source Ricardo-AEA 2014.

How does congestion impact upon the productivity and economic contribution of freight? To what extent does congestion affect changes to mode, time or other freight choices?

The economic costs of congestion to road freight has been referred to above. The contingent effects of freight prompt shippers to change their transport schedules by incorporating buffer times - especially where there are constraints on reception slots. This is seen particularly in deliveries to urban retailers where space constraints and the need to replenish stocks frequently mean that failure to arrive promptly can result in curtailment of deliveries or lorries being turned away to return for a later slot.

Drivers' hours restrictions, with compliance now automatically monitored by digital tachographs, are such that unexpected congestion can require drivers to break before their planned time or risk penalties for infringement of the rules.

It is also probable that congestion has spread more traffic – including lorries and vans – into off peak periods and from weekdays to weekends. However, we have not been able to identify statistical evidence of this as the published data[40] does not span a sufficiently long period. Braithwaite suggests however that the expansion of online shopping may remove some off-peak personal shopping trips at the expense of more home deliveries by vans

[40] DfT 2017s.

which have to operate in peak as well as off-peak periods[41] and a study by Ipsos MORI concluded that 61% of home deliveries were on weekdays during the daytime.

How does congestion affect the environmental impacts of the movement of freight?

Road traffic congestion impacts on lorry and van emissions as described above. It will displace some movements to quieter times which are likely to be more sensitive to traffic noise and fumes and there will be some displacement of goods traffic (especially vans) away from congested main roads where less congested alternative routes exist with adverse implications for their frontagers. Road congestion may also encourage some switching of traffic to waterways and rail however this is likely to be very limited because of the different characteristics of road and other forms of transportation.

With limited space for new infrastructure, how can we better use our existing urban network to support freight? Are there changes – such as changes to modes, methods, or delivery times - that could help reduce the stress on the urban transport network?

Urban freight movements are almost exclusively by road – even when they arrive or leave the area by another mode of transport - and the scope for modal change is negligible because of the scarcity of portals to rail and waterborne transport in even the largest urban areas. There is scope for changes in delivery times and with the growth of internet shipping home deliveries this is already occurring to some extent[42]. Attempts have been made from time to time to promote 'out of hours' deliveries such as Operation Moondrop in central London in the late 1960s[43]. This failed because too few retailers were prepared to staff their premises during the night.

With the development of modern logistics it should be easier to deal with this problem and there are a number of European examples of successful implementation of night time deliveries[44]. A demonstration project was carried out into the run up to the 2012 Olympic Games[45] which met with partial success and Transport for London is promoting out of hours deliveries[46] with some success. However, caution should be exercised in estimating the potential for this policy as only certain types of operation are amenable to conversion to out of hours deliveries, it requires careful planning and management and it can impact adversely on local residential amenity.

Another measure that has been tried over many years is the provision of freight consolidation centres where large loads are broken down at peripheral facilities, near large towns and cities, and consolidated into smaller shipments serving a round of urban retailers. To have a significant impact these need to have associated warehousing space and logistic services and some restrictions of HGVs in inner city areas. A well know example is the Garanor complex near Paris[47]. An attempt to provide a similar facility in London at Neasden

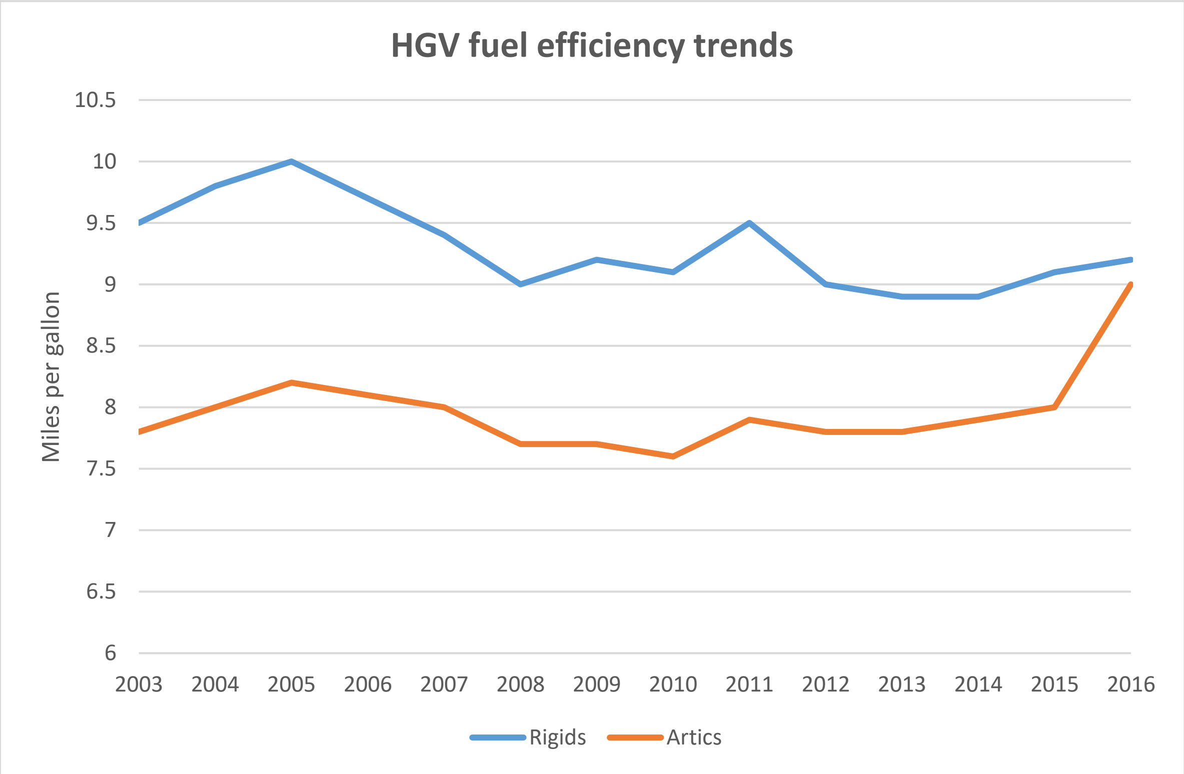
[41] Braithwaite 2017, P29.
[42] Ibid.
[43] Commercial Motor 2018a.
[44] Polis 2018.
[45] DfT 2011.
[46] TfL 2018a.
[47] Garanor 2018.

in the 1970s did not achieve a general consolidation capability. More recently there have been some examples of the use of industry specific consolidation centres in London[48] notably for the construction industry and for organised groups of users with similar needs and where there is no immediate commercial rivalry[49].

Are there efficiencies within freight management and distribution practices that could help reduce the CO2 and NOx emissions from freight?

As Figure 3.6 makes clear the introduction and diffusion of cleaner diesel engines will provide a considerable reduction in noxious emissions (these curves are for NO_X but the picture is similar for particulates). However, the picture for CO2 is less encouraging as can be seen from Figure 3.7.

Figure 3.7: Average rigid and articulated fuel consumption 2003 – 2016.



Source: DfT 2017t.
Note: the sharp improvement in Articulated HGV consumption between 2015 and 2016 may be as a result of rounding.

The increase in fuel consumption for rigid HGVs is a result of the parc mix changing in favour of heavier vehicles as weight for weight there have generally been fuel efficiency improvements. This modest trend of fuel consumption improvements is likely to continue as modern diesel and engines are already very efficient. Substantial reductions of CO_2 emissions from urban freight activity could be achieved by electrification of vans operating in towns and cities. Van electrification is a practicable proposition as many vans have duty

[48] TfL 2018b.
[49] TfL 2018c.

cycles which are capable of being met with electric vehicles[50] and are operated from premises where fast charging facilities can readily be provided.

With the help of the government Ultra Low Emission Vehicle grant scheme[51] the number of plug in vans has been growing strongly over the last few years – albeit from a very low base[52] and clearly more needs to be done to provide a richer public charging network[53]. There is now a wide range of electric vans under development and in production[54] but the limited public charging network, the range, reliability and flexibility of the modern diesel van and the, as yet, undeveloped second hand and leasing markets raises questions as to how readily the many smaller van operators will adopt this technology.

How charging networks should relate to developing operating patterns also needs to be addressed especially in the context of logistic centres extended charging episodes may not fit with rapid turnaround scheduling.

What role do alternative fuels such as electricity, Liquid Petroleum Gas and biofuels have to play? What are the barriers and challenges to wide-scale uptake of alternatives to diesel and what could be done to help remove these issues?

Whilst LPG and some other alternative fuels have merits for urban van operations, plug in electric and hybrid electric traction offers the greatest potential in reducing both noxious and CO_2 emissions as described above. For HGV operation it is less clear. A number of manufacturers (e.g. Mercedes, BMW and Tesla) have prototype electric HGVs but these have yet to demonstrate that they have the range and performance needed for general HGV operations with HGVs covering, on average, 34 thousand miles a year[55]. For lighter HGVs hybrid (diesel-electric) operations are a realistic medium-term prospect but for heavier vehicles diesel traction seems set to continue to dominate and an initiative to develop a (more efficient) commercial gas turbine diesel tuck in the late 1960s[56] ended in failure. In the longer-term hydrogen power is a possibility but alternatives to fossil fuel feedstocks will be needed if carbon emissions are to be much reduced and, of course, a new national hydrogen fuelling infrastructure would be needed.

What technologies could best and most realistically be utilised to manage the carbon impacts of freight, both within urban areas and on longer strategic journeys? How could new technologies be utilised to increase the efficiency and productivity of UK freight?

Changing traction technology referred to above is one way of reducing carbon emissions from individual vehicles. Other means involve increasing the efficiency of the way in which road freight vehicles are used and here telematics have a role to play and can, along with changes in freight management, help develop:

[50] Bayliss 1979.
[51] Office for ULEV 2018.
[52] DfT 2017u.
[53] Dermott 2017.
[54] Hubbard 2018.
[55] DfT 2017v & 2017x.
[56] Commercial Motor 2018b.

- Urban consolidation centres
- Port centric logistics
- Reducing empty running[57]
- Reducing empty container movements
- Efficient road charging

With the exception of efficient road charging, there are examples of good practice to be found for each of these developments[58] however their implementation is rarely straightforward.

How will new technologies change the capacity and performance of the freight transport network? Over what timeframes might these new technologies begin to affect the freight transport network?

It is not possible to give a comprehensive answer to such a general question. A more tractable approach is to look at where present trends are leading and then examine what diversions and disruptions are likely or possible.

As described earlier the environmental impacts of road freight transport emissions are set to be reduced through the introduction and dissemination of cleaner engine technologies. Following an earlier feasibility study[59] the government has commissioned trials of lorry platooning which are to take place this year[60]. These are designed to help understand issues such as fuel efficiency and reduced emissions, safety, acceptance by drivers and other road users, implications for future infrastructure, and the commercial case for adoption. It is possible that platooning may increase highway capacity but the extent to which this could arise is, as yet, uncertain and given the relatively close spacing of junctions on many stretches of UK motorway, the prospects for improved traffic efficiency (as opposed to cost savings from employing fewer drivers) seem relatively low. Efficient road charging applying to all traffic could potentially have beneficial effects of road freight operations by reducing journey times and improving reliability. However, despite this, and detailed analysis of a national road pricing scheme[61], there is no political appetite for developing plans for implementation.

How can the use of data such as real-time traffic information by artificial intelligence and machine learning systems help to improve freight efficiency and productivity? How might this affect the business models and requirements of freight in the future? Are there any barriers to the greater use of data in freight?

Real time traffic information can be used firstly to provide a detailed history of road traffic conditions and how these are affected by external factors such as weather, traffic incidents, major events etc. and so establish more accurate bases for vehicle scheduling. Secondly, they can be used to revise schedules in real time and advise dispatchers and recipients of

[57] See Chani 2016 for example.
[58] See Gazard 2014 and ITC 2017.
[59] Riccardo et al 2014.
[60] TRL 2017a.
[61] DfT 2004b.

changes in expected dispatch and delivery times. These in turn should help improve inventory management and staff rostering. Potentially they could also be used to re-plan shipment timings to reduce journeys in congested conditions. Whilst there could be potential for greater inter-company collaboration through TPLMs the commercial interests of individual companies may not always make this a viable proposition.

How do you see technologies such as HGV platooning, digital railway signalling, and autonomous vehicles being integrated into freight distribution?

HGV platooning might conceivably provide lower cost lorry operations on motorways, but as noted above, that is far from certain at this stage. Platoon planning – somewhat akin to rail freight operations – in which shippers can book slots in scheduled platoons also seems a possibility but the need for most journeys to take place in part on, often congested, all-purpose roads means that platoon formation is more likely to be on an 'as and when' basis.

Autonomous vehicles could be used for local deliveries and the Gateway trial of home deliveries of groceries in a part of the London Borough of Greenwich[62] will provide a useful indicator of how such schemes might operate. Whilst single operator/product systems offer relatively simple logistical problems, multi-user/multi product systems are more complex and their potential more uncertain.

How might regulations and physical infrastructure need to adapt to new technologies and business models in the freight sector?

Vehicle construction and use regulations will have to be changed to allow the operation of Connected and Autonomous Vehicles (CAVs) and the government has started to address the issues involved[63]. There may also be a need to change traffic regulations to enable the operation of CAVs in defined traffic circumstances and to restrict access to defined types of traffic operations to vehicles not suitable equipped. A fuller statement of the Foundation's position is contained in its response to the Centre for Autonomous & Connected Vehicles Consultation on Pathway to Driverless Cars: Proposals to support advanced driver assistance systems and automated vehicle technologies[64].

Improvements to the physical infrastructure to enable technological development in the freight sector should include those that support CAVs in general including high quality carriageway markings and signage and the plant and easements necessary to enable the installation of electronic communication systems.

The concentration of HGV movements on the strategic road system make the improvement of this, and the management of traffic on it, of particular importance. At present it appears that the main freight-specific CAV innovation lies with lorry platooning but the paucity of high quality roads, on which this is suitable, forms a major barrier to the deployment of this technology. Currently 58% of Britain's strategic road network is motorway or dual

[62] TRL 2017b.
[63] DfT 2017y and 2017z.
[64] RACF 2017a.

carriageway and just 32% of the major road network[65]. The full benefits of CAVs are most likely to be realised on these limited access roads for both freight and general traffic and the UK comes close to the bottom of the EU league table in this regard with only 28% of the EU average of motorways/unit of GDP[66]. This means that road freight in the UK has less potential to benefit from limited access highway applications of CAV technology than its major European competitors.

Are there good examples internationally of freight systems, policy, infrastructure or technology development and implementation that the UK can learn from to increase freight efficiency and/or reduce the carbon and congestion impacts?

There are many examples of overseas developments in freight and logistics from which UK practice can potentially benefit, although it should be recognised that that UK road freight industry has long been very competitive. Some of these have been cited in answers to specific questions[67] and there are a number of other studies[68]. Whilst there is a wealth of material on freight and logistics care needs to be taken in interpreting its findings in the particulars of the UK's industrial structure, transport infrastructure and pattern of demand for goods and services.

[65] DfT 2017aa.
[66] EU 2017 tables 1.1 and 2.5.1.
[67] E.g. CFIT 2010, Garanor/Logicor 2018, Gazard 2014, ITC 2017 and Polis 2018
[68] E.g. Euro-CASE 2001, Ecorys 2015 and EU 2015.

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Calor Gas response to the National Infrastructure Commission Freight Consultation
March 2018

Calor is the UK's leading supplier of liquid gaseous fuels, which can be used for both heating and transport. Calor is fully supportive of a cost-effective, pragmatic yet ambitious approach to emissions reduction, air quality improvement, and is devoting significant resources to innovation and diversification. Liquefied Petroleum Gas (LPG) and Liquefied Natural Gas (LNG) both have great potential for reducing emissions from vehicles. They both also have a lower carbon footprint than commonly used alternative fuels, such as diesel and petrol.

Calor welcomes this opportunity to provide examples of how LPG and LNG could help with issues such as air quality and carbon emissions associated with the freight industry in the UK. Should the Commission require further guidance on the topics discussed below, Calor is available to provide further evidence, both written and in person.

<u>Answers to Questions</u>

4. How can freight lower its carbon and air quality impacts?

I. Are there efficiencies within freight management and distribution practices that could help reduce the CO_2 and NOx emissions from freight?

Calor Gas believes that there is considerable potential in using alternative fuels in freight transport that can help reduce emissions, and improve fuel- and cost- efficiencies in the sector.

Calor's work with LPG (liquefied petroleum gas) and LNG (liquefied natural gas) as alternative vehicle fuels has proven this, as these fuels offer an efficient, low-cost and lower-carbon option that is available now to improve CO_2 and NOx emissions in freight. Additionally, Calor is bringing BioLPG to the UK market in 2018, which has the potential to reduce carbon emissions by up to 80% (dependent on the production method). Biomethane, which is already available, can also be liquefied and Calor can therefore provide LBM (liquefied biomethane) to its customers.

Calor has rolled out a number of successful projects to demonstrate the value of switching to LPG in light road vehicles, including a highly effective taxi retrofit scheme in Birmingham. Independent testing of a TX4 taxi (a typical Black Cab) repowered to run on LPG revealed that after conversion the taxi emitted 99% less PM, 80% less NO_x, and 7% less CO_2.

Calor is currently working with Dutch EV vehicle developer Emoss Ltd to provide the UK market with an electric powered truck with an LPG range extender (RE), to meet the needs of larger freight vehicles. This model has a total range of 400km, and can travel for 64km solely on battery. Using BioLPG, the total CO_2 reduction would be 94% compared to a diesel equivalent. The figure below illustrates the influence of hybrid technologies, such as this LPG RE truck, to produce significantly lower greenhouse gas emissions when compared with conventional diesel HGVs.

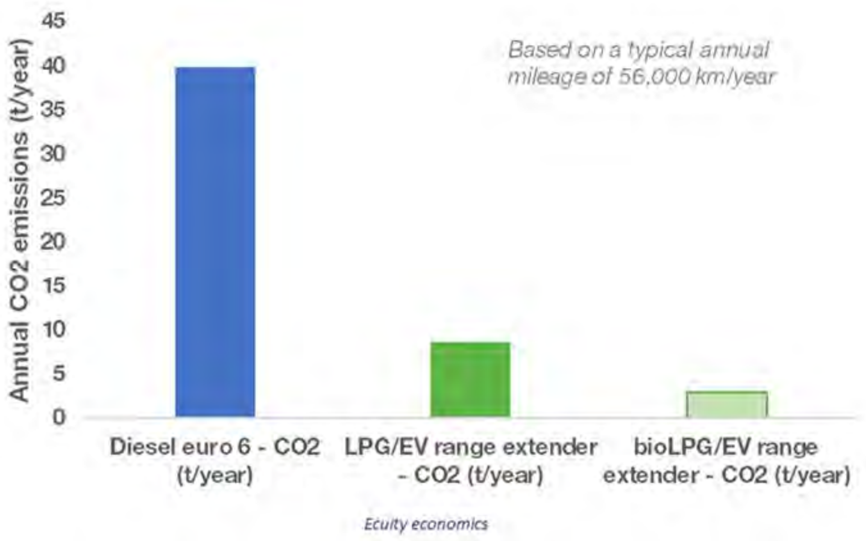


Figure 1: Taken from London environment strategy response

LNG is most-suited to larger HGVs. Calor is currently working with a number of vehicle manufacturers, which are looking to introduce LNG-fuelled trucks into the UK market. These provide an immediate 20% reduction in carbon emissions from conventional diesel, offering the same load capacity and performance. Additionally, there is a 39% reduction in NOx, and a 68% reduction in particulate matter.

II. **What role do alternative fuels such as electricity, Liquid Petroleum Gas and biofuels have to play?**
   a. **What are the barriers and challenges to wide-scale uptake of alternatives to diesel; and**
   b. **What could be done to help remove these issues?**

As discussed above, Calor believes that alternative fuels, particularly LPG and LNG (including the bio-versions of both fuels) have a significant role to play in the future of freight, and they are available now to reduce carbon and air pollution.

Calor finds, however, that the barrier to the wide-scale uptake of these fuels is primarily a supply issue. Manufacturers are reticent to bring factory-fitted LPG vehicles to the UK market, even when the production of left-hand drive vehicles using the same technology is widely available across the continent. There is an already installed LPG refulleing network across the country, which would be expanded at no cost to the government, if demand forautomotive LPG increased. We feel that there is an interest, and indeed an imperative, for the industry to switch to alternative fuels, but the industry lacks the vehicle supply to make this change. That being said, Calor is working closely with Volvo, Iveco and Scania to lead in the manufacture of LNG trucks in the UK, and upgrade the largest, public LNG network across the UK by investing £3.5 million in new refuelling technology.

We feel that the industry would benefit from stronger signalling of support from the Government to demonstrate that LPG/BioLPG and LNG/LBM are realistic alternatives to diesel. The availability of refuelling infrastructure is one such example. In the instance of LNG, Calor Gas is actively rolling out refuelling networks across UK highways, and as demand for the fuel increases Calor will build the infrastructure to accommodate this, at no cost to local authorities or government. Calor already has a strong presence in the UK's LNG infrastructure along the road network, operating a total of 7 publicly available refuelling hubs. This includes one near Donnington and one near Grantham, supported by the Department for Transport's Project Evergreen, a particularly effective funding and policy mechanism. We are undertaking an extensive upgrade of our infrastructure in the coming months to further grow capacity, and local haulage firms have welcomed our refuelling hubs. However, as yet they are only used by vehicles running dual fuel LNG and diesel. Against the rest of Europe, the UK is faring relatively poorly on the uptake of LNG infrastructure for freight movement: the continent has seen a 348% increase in refuelling stations since 2013, taking the number available to 101.

We would argue that the Government should be technology neutral in its policy. Indeed, we welcome the recent announcement in the 2017 Autumn Budget to freeze the Fuel Duty Escalator for LPG. The industry would greatly benefit from further meaningful signals of support from Government like this, but more needs to be done to future-proof the industry.

Financing the transition away from diesel fuel remains however a considerable challenge to freight companies, particularly SMEs and individual drivers. At this time, Calor would also reiterate its policy suggestion of a diesel scrappage scheme, aimed especially at vans and lighter freight vehicles, to assist in this transition. This would enable the switch to cleaner vehicles by smaller businesses and individuals, who are otherwise unable to afford a new vehicle. Under a scheme proposed by Autogas (Calor's joint venture with Shell), end-users would be able to access a fixed grant of £2,000 for the purchase of an LPG van. This would cover the cost of conversion of the petrol engines (including the warranty), and would make LPG vans cheaper than diesel models as, in the vast majority of cases, diesel vans have a similar purchase price to the LPG equivalent (based on price points offered for right hand drive).

III. What technologies could best and most realistically be utilised to manage the carbon impacts of freight, both within urban and on longer strategic journeys?

First of all, Calor is leading the drive to incorporate BioLPG in its products to yet further reduce the carbon intensity and improve the air quality benefits of alternative fuels. Calor is in the process of supplying over 20,000 tonnes of BioLPG into the UK, with the first shipment expected to arrive in spring 2018. Calor's first delivery of BioLPG is produced as a by-product of biodiesel and Calor is actively researching other methods, such as using gasification of household waste to create propane. BioLPG offers a potential well-to-wheel greenhouse gas savings of up to 95% compared to fossil LPG.

For large vehicles making longer journeys, LNG in HGVs is more suitable, and air quality improvements can similarly be made using LBM as a drop-in fuel. Volvo state by using LBM and biodiesel (HVO) on a tank to wheel basis reduces CO_2 by 100%. Volvo, Iveco and Scania all offer LNG for long distance haulage, which demonstrates the demand in this sector to move to LNG, due to it offering greater reductions in particulates and emissions from existing fleets.

To improve the carbon emissions and air quality impacts of freight journeys in urban areas, Calor would also recommend a strategic approach to freight management by establishing hubs on urban peripheries where larger HGVs can off-load goods into smaller vans. This would improve movement efficiency whilst reducing localised air quality concerns of stationary vehicles with running engines. Vans and light freight vehicles have, arguably, even greater potential for the use of LPG as a fuel alternative. Existing vans can easily be retrofitted from diesel to LPG engines, as we have discussed earlier in this submission.

6. Are there good examples internationally of freight systems, policy, infrastructure or technology development and implementation that the UK can learn from to increase freight efficiency and/or reduce the carbon and congestion impacts?

Looking abroad, the Government should seek inspiration from Germany which finds itself in a very similar position to the UK; greenhouse gas emissions from Germany's energy sector were reduced by 21% between 1990 and 2015 whilst the reduction in the transport sector was just 2%. Germany is looking to LNG HGVs to replace petrol, diesel and heavy fuel oils in order to bring down freight emissions quickly in the clear absence of any direct electric or battery electric alternatives. A consortium of 61 companies is participating in a Europe-wide project called *European Blue Corridors* which will increase the uptake of LNG by creating four routes or "blue corridors" with a fuelling station positioned every 400km along Europe's main roads. This will mirror the highly developed network of LNG stations which already exists in the Netherlands, for example.

From an air quality perspective, there are a variety of innovative schemes which could be examined in many cities. For example, in Berlin as well as in 80 other German cities, a Low Emission Zone has been operating since 2008. Berlin initially banned pre-Euro 2 diesel vehicles before banning pre-Euro 4 diesel in 2010; consequently in the first two years of operation alone, levels of PM and NO_X in the Zone reduced by 58% and 20% respectively[1]. Drivers not displaying a colour-coded sticker indicating the cleanliness of their vehicle are fined €80[2]. The Berlin state government also sent positive signals about alternative fuels, stating on its website that "natural gas is particularly clean fuel", and encouraged its uptake with preferentially low tax rates leaving fuel costs around 50% lower than petrol and 30% lower than diesel[3].

[1] Impact of Low Emission Zones, European Commission website.

[2] Vehicles and badges, Berlin State Government website.

[3] Retrofitting, funding and financing options, Berlin State Government website.

Magway: Delivering the Future

3 MARCH 2018

MAGWAY LIMITED
Authored by: [Names redacted]

Delivering the Future

Magway is a novel solution to the UK's current and future freight challenges

"Q2. How might the demand for freight develop and change over the next 20-30 years?"

The UK is currently at a transportation cross-roads. The continuing growth in e-commerce has driven a huge increase in parcel and grocery deliveries to consumers. The expectation is that this will only increase over the next 20-30 years. At the same time urbanisation continues at a pace with an increasing proportion of people living in densely populated conurbations. The UK, with 54% of its population living in the 64 largest cities [1] reflects a global trend where forecasts predict over 60% of the world's population will live in cities between 2040-2050 [2].

Consumers are going to buy online rather than off a shelf and this will create a vast increase in parcel deliveries. A radically new solution is needed to reduce the impact of these parcels on our existing transport infrastructure.

"Q3. What effects does congestion have on the efficiency of freight movement and emissions?"

The combination of these factors has contributed to a rise in the volume of vans on our roads. The number of HGVs registered in the UK, has risen steadily by 9% since 2010 to over 500,000 vehicles. [3]. Similarly, LGV van miles have grown by 70% over the last 20 years and are the fastest growing sub-category with over 4 million vehicles already on the road. [3]

Our road network is struggling to cope, with the UK being the 4th most congested developed country in the world [4], with drivers spending an average of 32 hours a year in peak hour congestion. The annual cost of this to the UK, was £30.8bn in 2016, an average of £968 per driver [4]. London the most congested city accounted for 20% of the total at an average cost of £1,911 per driver [4]. The other UK cities making up the top 5 in terms of congestion are Manchester, Aberdeen, Birmingham and Edinburgh.

Government, capital expenditure is playing catch-up to improve our road network. Meanwhile maintenance costs alone amount to more than £2bn pa across the network [5]. This excludes an additional £12bn required to bring just local roads up to scratch.

The only way to tackle congestion is by removing vehicles from the system and delivering parcels through another means.

"Q4. How can freight lower its carbon and air quality impacts?"

Noise and air pollution present further on-going challenges with over 40,000 premature deaths, linked to air pollution annually in the UK of which 9,000 were just in London [6]. Whilst road accidents and safety have seen a steady downtrend, they remain too high with 1,284 deaths or serious injuries caused by HGV's in 2016. Whilst HGV's account for 12.2% of motorway traffic they are involved in 41% of motorway accidents resulting in fatalities [7].

Whilst cleaner vehicle types can lower emissions there is a more fundamental solution that can use clean energy, remove vehicles and produce no emissions. Now is the time to plan for change!

Magway Overview

> ***"Q5. How could new technologies be utilised to increase the efficiency and productivity of UK freight?***

Magway, is a new solution, converging the benefits of road and rail to address these challenges. Taking a novel approach to tried and tested linear motor technology, combined with its own IP, it can transport high volumes of goods between retail distribution centres and multiple consolidation centres bypassing and relieving current bottlenecks. The goods are moved rapidly, reliably and sustainably, via small unmanned vehicles travelling within enclosed pipes, like those currently used by utilities. The pipes can run above ground, be shallow or deep buried or combine these options. The solution is modular and includes various resiliency options in the rare event of a blockage occurring.

Magway generates zero-emissions, is safe and non-weather or driver dependent. Additionally, its operating costs are substantially lower than current road solutions meaning that e-tailers can save substantial amounts of money by trunking their goods via Magway, and provide an improved service to their clients.

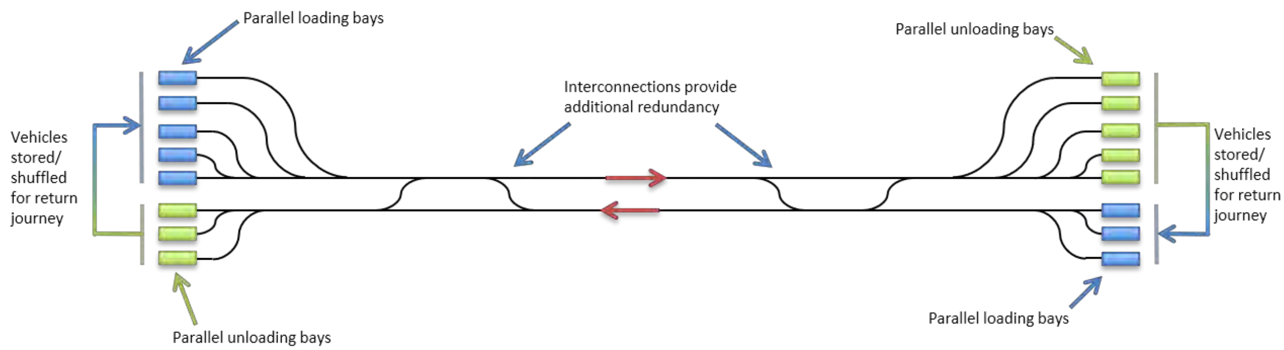
Costs

Infrastructure projects are notoriously capital intensive and often the up-front costs become prohibitively expensive. By focusing on freight and automation, and utilizing small pipes of only 0.9m in diameter we have been able to reduce the complexity and associated capital cost of installation to below £1m per km. The pipes are still sufficiently large enough to accommodate the entire home grocery delivery market, forecast to grow by 68%, to 1bn totes per annum by 2021 [8], as well as more than 90% of the 3bn annual parcel delivery market currently coming out of Customer Fulfillment Centres (CFC's) [9]. Taking a significant proportion of these goods off the roads would have a major impact on reducing HGV and LGV miles and the associated detrimental effect of these vehicles. Also, by shortening the distance of the "last mile" delivery we are opening the way for a broader range of delivery options including autonomous and electric vehicles, click and collect, couriers and drones. Having a commercial operating system up and running would also provide evidence for further, more ambitious routes.

- Hatfield to Old Oak & Park Royal
- Milton Keynes to Hatfield (extension)
- Manchester to Liverpool
- Manchester to Leeds
- Leeds to Sheffield
- Oxford to Cambridge
- Gatwick to Heathrow
- Glasgow to Edinburgh
- Bristol to Cardiff
- Birmingham to Leicester
- …

Magway Operation

Magway transports plastic totes from distribution centres; within enclosed carriages. The system provides for automatic on-boarding and off-boarding of the carriages onto the system from multiple distribution centres. This will be available to commercial partners as a turn key solution, presenting a limited up-front cost to them. The individual vehicles are coordinated using computer control systems to enable vehicles to travel rapidly and at close proximity. Linear synchronous motors (LSMs) are ideal for such a system, as they enable precise control over speed and position. This combines the benefits of platooning, automated digital switching and autonomous unmanned vehicles.



In the case of general merchandise e-tailers the goods and carriages at the other end will be managed by their preferred third party logistics company/ies including DHL, Royal Mail, Clipper etc. As it stands the grocery retailers will receive the totes into their own consolidation centres for delivery into their client's homes.

Online delivery logistics is currently dominated by road transport, largely serviced by HGV and LGVs. Magway is an automated, non- polluting solution that takes traffic off the roads, and will deliver multiple benefits to the public sector the environment, the population at large and to commercial partners.

Benefits

Public Sector

- ✓ Zero emissions; reduces air pollution
- ✓ Near silent operation; reduces noise
- ✓ Provides alternative to HGV/LGV transportation
- ✓ Reduced congestion
- ✓ Reduced impact of HGV/LGVs on road network & associated maintenance costs
- ✓ Improved safety
- ✓ Relatively low capital costs <£1m per km
- ✓ Privately funded
- ✓ Small footprint reduces disruption around installation.
- ✓ Consolidation of goods reduces volume of "final mile" deliveries.

Commercial Partners

- ✓ Significantly lower operating costs
- ✓ Removes driver limitations costs and availability for trunking goods
- ✓ Improved safety along route
- ✓ Improved security along route
- ✓ All weather solution
- ✓ Turn-key solution with limited up-front capital costs
- ✓ Reduced distance of "last mile" facilitates
    - Broader range of delivery options including electric and autonomous vehicles, click & collect, drones, courier, …
    - Improves predictability and availability and variety of delivery slots
    - Improves customer service
    - Reduces packaging requirements

General Public

- ✓ Reduced air and noise pollution
- ✓ Reduced congestion
- ✓ Improved safety
- ✓ More efficient deliveries

Competing Systems

"Q6. Are there good examples internationally of freight systems, policy, infrastructure or technology development and implementation that the UK can learn from to increase freight efficiency and/or reduce the carbon and congestion impacts?"

There are several competing consortia that are looking at transportation via linear motor pipeline. These include Virgin Hyperloop One, various Hyperloop Consortia (UK & international), Cargo Sous Terraine (Switzerland), Mole Solutions (UK), Cargocap (Germany) and The Boring Company (USA). All of these are focused on either people and/or bulk goods transportation. Whilst they recognize many of the challenges that Magway addresses, the increased complexity and size of the proposed solutions adds substantially to the upfront capital costs and planning issues.

Challenges

Linear motors are currently installed in some of the most extreme environments; temperature, altitude and sub aqua. Hence the technology is tried and tested and the solution extremely resilient.

We see the most significant challenges for Magway and similar solution being around rights of way and planning. Public policy could contribute significantly towards facilitating and accelerating the introduction and roll-out of this as a future option for the transportation of UK freight.

References

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6. The Royal College of Physicians and of Paediatrics and Child Health, *Every breath we take: the lifelong impact of pollution* 2016
7. Department for Transport, *Reported road casualties Great Britain 2016*
8. IGD Retail Analysis *UK Online Grocery Market,* 2017
9. Apex Insight *UK Parcels Market Insight Report 2017*

Contact details

[Name redacted]
[Job title redacted]
[Email address redacted]
[Telephone number redacted]

[Name redacted]
[Job title redacted]
[Email address redacted]
[Telephone number redacted]

Magway Limited is registered in England and Wales.
Company number 11011754. VAT registration number GB 288 6023 74.
32A Maresfield Gardens, London NW3 5SX United Kingdom

www.magway.tech

Submission from Highways England to the National Infrastructure Commission's freight study

About Highways England

Highways England is the government-owned company responsible for operating, maintaining and improving England's strategic road network (SRN). The SRN comprises over 4,300 miles of motorways and major A roads, which support journeys totalling 85 billion miles a year.

With more than nine in 10 businesses within 10 miles of the network and 90 per cent of the population living within 6 miles, the SRN delivers essential social and economic value every day. Totalling only 2% of England's roads the SRN carries one third of all traffic and two thirds of all freight.

Highways England is part way through the Road Investment Strategy 2015-2020, an ambitious £15 billion plan to invest in roads infrastructure to boost the economy, connect communities and to keep England moving.

There are over 45,000 people employed in the highways industry, and many more jobs rely on the connections it creates. Safety is Highways England's number one priority and we believe that nobody should be harmed when travelling or working on our roads. Highways England strives to be at the forefront of road infrastructure and new technologies, including delivering smart motorways, supporting the use of electric and autonomous vehicles, and using new materials to deliver a quieter, more environmentally friendly road network.

Highways England's role in road freight

Highways England was created as a government-owned company in April 2015 in order to take a long-term, strategic and evidence-based approach to operating, maintaining and improving the SRN. A move to five year planning and funding cycles has provided greater certainty and clarity over investment priorities and ensures that Highways England is fully accountable for its performance. As a government-owned company, Highways England is well placed to build an economic evidence-base to inform investment decisions and to engage with customers, stakeholders and partners across the country. This represents a step change in how road investment is delivered in England and means that our customers, including the freight industry, benefit.

The SRN connects the country, carrying a third of all traffic and two thirds of all freight. In one year, 1 billion tonnes of freight is transported on the SRN - more than on all other roads and transport modes combined. Below we set out how we are working to support the SRN's key role in boosting the economy; how managing the network delivers for the freight sector; how Highways England's investment is helping to improve and develop the SRN further; how we work with partners to ensure we deliver; and how we are working to help shape the network to support the freight industry of the future.

Boosting the economy

The SRN is an essential piece of national infrastructure. It is vital in unlocking the social benefits of mobility and critical to national and regional economies. The freight industry depends on good availability of the strategic road network allowing goods to be transported nationally and internationally through access to the UK's network of ports. It has specific user needs and constraints, for example commercial drivers are subject to driving time limits and are legally obliged to take regular breaks and rests. The transportation of goods is increasingly multi-modal, with at least part of the journey undertaken on the country's motorways or major A roads. Sectors heavily reliant on the SRN employ 7.4 million people and contribute £314 billion in Gross Value Added to the economy. An SRN, managed with a strategic and national view of the network, creates connections to the country's urban centres and ports, ensuring vital connectivity for the freight industry.

Managing the network

Highways England operates the network to make sure it performs in an optimum way for all customers, including the freight industry. We recognise the economic and social value of keeping the strategic road network moving safely. This includes a focus on using technology to improve traffic flows and to make journeys more reliable, a crucial component of freight management. Smart motorways provide additional capacity on the SRN through the use of all-lane running (ALR), with technology deployed to ensure safe operation and to manage traffic flow through variable speed limits. Our dedicated team of traffic officers is on the network 24/7 to keep our roads as free-flowing as possible – taking pre-emptive action to avoid incidents occurring and responding quickly to clear them when they do. In 2016/17 we cleared 85.93% of incidents within one hour, achieving the 85% target set.

Investing in the network

As well as managing the network, Highways England is delivering the biggest modernisation programme the SRN has seen in a generation. This investment is targeted and informed by evidence, and is driven by economic and strategic considerations. The £15bn first road investment strategy (2015-20) is already delivering significant improvements across the country and will see a balanced programme of delivery. We will continue to advance transformational road projects including the Lower Thames Crossing, the A303 at Stonehenge and the A14 in Cambridgeshire, whilst also delivering smaller schemes that increase capacity, alleviate congestion and offer better, more reliable journeys. Since 2015, we have completed 18 major schemes, and started work on a further 15. The second road investment period (RIS 2, which will run from 2020-25), will be based on a strategic, evidence-based analysis of performance and future demand across the network. In spring 2017 we published our RIS-2 Route Strategies which take a high-level view of performance and demand pressures across 18 key transport corridors[1]. Our national outlook allows us to ensure these transport corridors deliver for the freight sector and other users of the network. Our Initial Report sets out that these route strategies will deliver a network that is safe and serviceable, more free-flowing, more accessible and integrated and one that will help to support economic growth and improve the environment[2].

Working with partners

Highways England works closely with partners and users of the SRN, both on the day-to-day management of the network and longer term strategic investments. Through close working with the freight sector, local authorities, local enterprise partnerships and sub-national transport bodies, Highways England is able to better plan for the future and to deliver a network that meets our customers' current and emerging requirements. Highways England is a statutory consultee on planning decisions that affect the SRN, including roadside facilities and parking for freight vehicles. Day-to-day engagement with stakeholders and customers helps us to understand current issues and to ensure that the impact of both major projects and routine maintenance is minimised. This dialogue is crucial to ensure that the SRN is responsive to both the operational and long-term needs of the freight industry.

Shaping the future of the network

It is essential that Highways England takes a long-term view of the SRN. We need to understand and keep pace with predicted advances in technology, changes in social attitudes to transport and the environment and further globalisation. Highways England's work on connected and autonomous vehicles (CAVs), freight platooning and electric vehicles will help shape the future of the transport network, and how the SRN needs to adapt to the new challenges ahead. We are shaping the network, driven by new technologies, the needs of our customers and the future needs of the economy.

[1] Highways England "Route Strategies: Our high-level approach to informing future investment on roads", March 2017. The individual route strategies can be found here: https://www.gov.uk/guidance/future-investment-in-englands-motorways-and-major-roads#route-strategies-march-2017.

[2] Highways England, "Strategic Road Network Initial Report", December 2017, page 13.

Questions

1. What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?

Road freight is a key part of the freight sector. Below we aim to set out the role of road freight, the key corridors in which freight is transported, the constraints to the movement of freight and the work of Highways England in addressing this, and finally the economic benefits that freight brings to the economy as a whole.

The large majority of freight in Britain is transported by road, with almost three times the quantity of goods moved by road than by rail and water combined[3]. Many goods rely on multi-modal supply chains, with at least part of the journey being undertaken by road. The SRN, for which Highways England is responsible for maintaining, is therefore a key component within the freight sector, and we recognise the importance of improving and maintaining links to airports and sea ports across England.

Whilst much industrial development remains centred on the highly accessible M1/M6/M25 motorway corridors, speculative logistics development is now starting to spread along other strategic roads, for example Omega in Warrington (M62) and Andover Business Park (A303/A34)[4]. The majority (60%) of the large developments since 2014 are located across the Midlands, which benefits from a central location and good access to the motorway network (M40, M6, M1). Major speculative industrial development in England between April 2014 and April 2016 highlights a South East to North West corridor (approximately Kent to Merseyside) where the largest developments are focused[5]. Global shipping numbers are rising and ports are well served by the SRN. This trend will likely continue to drive demand for large warehousing in locations with good accessibility to both ports and the SRN where goods can be stored and re-distributed nationally.

Access to airports will also form part of the mix. In 2015 London Heathrow airport had the highest freight air transport movements (1,496,551 tonnes), followed by East Midlands (291,689 tonnes), Stansted (207,996 tonnes) and Manchester Airport (100,031 tonnes). Highways England will play an important role in supporting the expansion of Heathrow Airport, constructing the critical road projects (such as the M25) in order to support expansion by 2030. This work, along with ensuring the M4 motorway is upgraded to a smart motorway, is essential work to ensure the extra air capacity is supported by improved connections to the strategic road network.

One of the key constraints to the movement of freight is capacity. In question 3 we set out how we are addressing congestion on the network. Highways England is delivering new road schemes that unlock economic and social benefits, overcoming some of the constraints to the effective and efficient movement of freight. Highways England's first business plan 2015-2020[6] set out that encouraging economic growth was a key performance specification, and something the government would monitor the organisation's success on. Our subsequent 'Road to Growth' strategy sets out how we seek to contribute to the economy by supporting SRN–reliant sectors and providing efficient routes to global markets. By understanding the economic significance of locations and their reliance on the SRN, we are better able to invest in schemes that will have the greatest economic impact. As part of the research stage for the second road investment strategy covering 2020-25 (RIS2) we have taken account of economic locations identified by local enterprise partnerships (LEPs) and incorporated these into the evidence-base supporting route strategies. By identifying Economic Opportunity Areas (highly reliant sectors are identified as international gateways, industrial clusters, logistics clusters and multi-modal transport hubs), we are more effectively able to deliver schemes that benefit economic development the most. In spring 2017 we published our RIS-2 Route Strategies which take a high-level view of performance and demand pressures across 18 key transport corridors, ensuring connectivity across the whole network. Platooning (discussed in question 5) may have a role to play in utilising the existing strategic road network more efficiently.

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3 Highways England, "The Road to Growth: our strategic economic growth plan", March 2017, page 25.

4 Highways England, "Commercial development and the strategic road network", November 2016, page 5.

5 Ibid, page 7.

6 Highways England, "Strategic Business Plan 2015-20", December 2014, page 6.

Stakeholder forums help Highways England to identify the current and future requirements of these sectors and we will use that knowledge to inform our operational and strategic planning. We have established a cross-modal partnership with the Department for Transport, Network Rail and the High Speed 2 Growth Partnership and will use this to explore how we can enhance domestic and international connectivity to better support business productivity and competitiveness. We have committed to share our economic evidence-base with government to inform the National Industrial Strategy and the National Infrastructure Needs Assessment. Our Network Planning team regularly meets with the strategic planning team at Network Rail to take forward pieces of work aimed at better multi-modal approaches, and this includes a specific work area on freight.

2. How might the demand for freight develop and change over the next 20-30 years?

The growth of online spending has led to e-commerce becoming the most influential sector in the UK big box industrial and logistics market, with retail accounting for 38% of total take up in 2015, the highest level since 2010. The UK has the most mature online retail market in Europe with 16% of total retail spend anticipated to be spent online by 2019. As online consumers have become increasingly demanding, logistics operators have had to streamline and optimise their supply chains to ensure next day deliveries and 'click and collect' deliveries can be made. This increasing need to quickly move large volumes of stock has resulted in requirements for progressively larger distribution centres built to high specifications in suitable locations near to consumers. There is increased interest in multi-modal facilities such as DIRFT (Daventry International Rail Freight Terminal) enabling heavier goods to be transported over longer distances.

Traffic on motorways has increased by over 50% since 1993, and is projected to grow another 31% by 2041. Online consumers' demands are likely to increase in the next 20 to 30 years, meaning road freight will place a significant demand on the network. Economic forecasts produced as part of the evidence-base for Road to Growth show that employment and Gross Value Added (GVA) growth in road-reliant sectors will be increasingly concentrated around key nodes on the SRN, in close proximity to key cities and with good access to international gateways. This includes routes in the South East radiating from Greater London and around the city regions of Birmingham, Bristol, Leicester, Nottingham and Leeds. Other hotspots are Milton Keynes, Manchester, Liverpool, York, Middlesbrough, Newcastle and the southern coastal towns. By identifying these trends, Highways England is better able to ensure investment in future capacity is targeted appropriately.

3. What effects does congestion have on the efficiency of freight movement and emissions?

Highways England recognises that delays on the SRN can be costly and disruptive to the freight industry, with current projections suggesting the cost of congestion could cost the freight industry £14 billion in 2040[7]. Any delays to freight vehicles can compound problems through delays delivering to clients, missed connections and general implications for highly restrictive schedules. By managing the network 24/7 we minimise these delays and keep our roads as free-flowing as possible. We regularly engage with the freight sector to discuss operational issues and to understand their view of the network's performance.

Highways England has targets to ensure congestion and delays are minimised, including a commitment to ensure that there is 97% lane availability on the SRN in any one year to support the flow of traffic. In 2016/17, we secured lane availability of 98.41%. Incidents on the network are also a key factor in causing delays, and Highways England has a target to ensure that at least 85% of incidents are cleared within an hour (in 2016/17 we achieved 85.93%.[8])

HGVs are the biggest contributors to NO_2 emissions close to the motorway network. As part of our air quality strategy, we are developing a range of ways in which we more accurately monitor air quality to help inform future decisions about the network. In addition, we are piloting schemes such as barriers and polymer material that absorbs NO_2 to explore how the network can help improve air quality[9].

[7] Highways England, "Strategic Road Network Initial Report", December 2017, page 9.

[8] Highways England, "Annual report and accounts 2016-17", July 2017, page 12.

[9] Highways England, "Our strategy to improve air quality", August 2017, page 7.

Smart motorways are a key part of Highways England's current and future delivery plans. By utilising technology we are able to increase the capacity of the motorway network in a way that is safe and offers more reliable journeys for motorists and industry. We believe that the 33% additional capacity provided by smart motorways will deliver substantial benefits to the freight industry by relieving congestion and enabling better journey planning.

4. How can freight lower its carbon and air quality impacts?

Road freight impacts on air quality, with emissions from HGVs being the largest element. A shift to cleaner fuels is taking place, driven by the market. However, HGVs currently represent 38% of NO_2 emissions close to the motorway network[10].

To support the uptake of electric vehicles, Highways England is working to ensure that customers driving on the SRN are never more than 20 miles away from a charging point (applying to 95% of the SRN by the end of this road period). The rolling out of charging points along the SRN is a first step, with changes in the market expected to be driven by the private sector as electric vehicles become more widespread.

Highways England is working with government and industry to help tackle the cleanliness of the road freight fleet. Highways England's air quality strategy sets out a number of pilots we have funded, including a feasibility pilot study into the use of incentives to speed up the modernisation of the HGV fleet and an electric van demonstrator project seeking to find ways to accelerate the uptake of these cleanest vehicles[11]. Because the average life span for HGVs (7 years) is considerably lower than that for cars (15 years), any new technologies have the potential to be taken up more quickly by the freight sector than by cars. However, the market in electric cars is currently more advanced than that for electric and alternative fuel HGVs. HGV platooning, set out in question 5, also has the potential to cut fuel consumption through the creation of more aerodynamic formations on the SRN (Scania Group estimates a cut in fuel consumption of up to 12 per cent.)

5. How could new technologies be utilised to increase the efficiency and productivity of UK freight?

New technologies have the potential to shape the future of the road freight sector. Broadly these fall into two areas: the technology used in vehicles and technology used on the road network.

HGV platooning has the potential to allow for larger cargos to be transported in one journey, with current trials exploring the connection of three lorries within one convoy controlled by a single driver. In August 2017 the Department for Transport (DfT) and Highways England commissioned Transport Research Laboratory (TRL) to lead the first real-world operational trial of platooning vehicles on UK roads. The £8.1m trial will see TRL lead a consortium of partners including DAF Trucks, Ricardo and DHL. Platooning, which will see how lorries can accelerate and brake in sync through wireless technology, has the potential to deliver a number of benefits, including improving air quality, increasing fuel efficiency and decreasing congestion. The three-stage trial will include trials on major roads by the end of 2018 and each phase of the testing will only begin when there is robust evidence that it can be done safely.

Highways England is also supporting a number of other connected and autonomous vehicles (CAV) trials including the UK Connected Intelligent Transport Environment (UKCITE) connected vehicle trial, working with Jaguar Land Rover, Coventry City Council, Visteon, Vodafone and others. Elsewhere we are working with Transport for London, Kent County Council and the Automotive Electronic Systems Innovation Network on the A2/M2 connected corridor. Through our participation in UKCITE we are also supporting the development of the UK's first fully connected roads. This will provide the infrastructure on 40 miles of public road, including the M40 and M42, to enable a range of connected technologies which will support the safe testing of connected vehicles in a real world environment. Work is also underway with the Centre for Connected and Autonomous Vehicles at Cambridge University to support the research, development and demonstration of CAVs. Connectivity can

[10] Ibid, page 5.

[11] Ibid, page 7.

increase safety and journey efficiency (with benefits for business productivity), and provide the potential for vehicles to travel in convoy, which would have obvious applications to the freight sector. Connected and autonomous vehicles also allow vehicles to provide data to the network. There are obvious benefits to frequent users of the network such as the freight industry, as technology would allow Highways England to deal with issues, ranging from incidents to damage to the network, more swiftly.

Smart motorways also increase the productivity of the road freight sector by relieving congestion. By making the hard shoulder available for use by traffic, additional capacity is created. Technology is also used to monitor traffic levels; change the speed limit to smooth traffic flow, reducing frustrating stop-start driving and improving journey times; activate warning signs to alert drivers to traffic jams and hazards up ahead; and to close lanes, in particular to allow emergency vehicles through. Congestion on the motorway and major road network in England costs the economy as a whole an estimated £2 billion every year, with 25 per cent of this resulting from incidents. We have commenced the rollout of a stopped vehicle detection system, with 50 radars being installed by spring 2018 to ensure that traffic officers are able to assist with breakdowns more quickly, keeping the SRN moving.

From: [Name redacted] [Email address redacted]
Sent: 02 March 2018 17:02
To: Freight Study
Subject: Freight Study Call for Evidence

Dear Sir / Madam,

Day Group operates 8 rail depots in London and the south of England and a wharf on the Thames. We own and operate over 150 Large Goods Vehicles, including 2,3 and 4 axle tippers and tipping artics. Last year, from 17 operational sites we supplied more than 5 million tonnes of construction aggregates, of which around 2.5 million tonnes was moved by rail.

Please find below our comments and observations in connection with some of the questions raised.

Questions included in the NIC Freight Study Call for Evidence**:**

What are the key constraints to the effective and efficient movement of freight in the UK and how do we overcome them?

An emerging constraint is the growing threat to the capacity of wharves and railheads resulting from complaints from residents of new schemes built close to such sites without proper protection from the inevitable noise that they create.

These sites can only continue to operate if they are properly safeguarded within the planning system. The focus on housing development in urban areas is generating increasing pressure to develop close to industrial land which is currently used as wharves and rail depots. If potential developments are allowed on or adjacent to such sites, the industry's ability to make full use of rail and water transport will be compromised. There are recent examples where this has happened. This is a current and national problem which has the potential to force significant volumes of aggregates back onto congested road networks and which can only be resolved if planning authorities recognise and implement policies which safeguard the operation of rail depots and wharves effectively.

In London, the London Lorry Control Scheme (LLCS) is a hindrance to effective and efficient movement of road freight.

Introduced in 1985, the LLCS was created to combat the noise and nuisance caused by lorries heading through London in the days before the M25 was fully open. The scheme, in its current form, is designed to encourage, some would say force, lorries to enter London at the same time as the majority of commuters in their cars. The resulting congestion is not only bad for the environment, it makes road freight movement very inefficient.

If the LLCS was abolished, deliveries in London could be retimed. This would make freight more efficient and have the effect of reducing the peak hour 'hot spots' that can be seen on the emissions maps.

The recent review of the LLCS resulted in the publication of short, medium and long-term goals, none of which offer any real hope to road hauliers of the ability to retime deliveries, reducing congestion and improving efficiency.

How might the demand for freight develop and change over the next 20-30 years

The recent Network Rail CP6 Rail Freight Growth Forecast consultation document presents a view on this that we support.

How can freight reduce its carbon and air quality impacts

Water and rail transportation of construction materials already make a huge contribution to keeping lorries off the nation's roads and this is largely un-appreciated. Whilst it will be highly desirable to further reduce freight's carbon and air quality impacts it is imperative that the good work that already goes on is protected and not undermined. As highlighted above, wharves and railheads are under threat from nearby development of housing, which does lead to noise complaints from residents.

There are recent examples of long established construction material facilities having their operating hours and therefore their capacity restricted because of such complaints.

As an example of the scale of potential impact, consider the case of Angerstein and Murphy's wharves in the Aggregates Zone in the Royal Borough of Greenwich. The activities on these sites are threatened by residential development on both sides of the river overlooking what are 24/365 industrial operations. If operating restrictions were to be applied to these sites and they were to be lost because they became uneconomic as a result, an additional **13 million HGV road miles** would be needed each year, with the associated road risks, congestion and emissions of CO^2, particulates and nitrogen-oxides. And that's just to keep building what we do now. Add in the Mayor's growth plans and these figures increase.

Further improvements could be made by allowing the existing lorry fleet to operate at higher weight limits. For example, a typical four axle rigid tipper is limited to a maximum gross weight of 32 tonnes. In contrast, until December's announcement from the DfT about increased regulation of Mobile Concrete Batching Plants (otherwise known as Volumetric Concrete Mixers), such vehicles were allowed to operate up to and even in excess of their design gross weight of 42 tonnes. This was because they were not regulated in the same way as HGVs and the DfT is taking steps to address this. As an interim measure (7-10 years) DfT is proposing to permit such vehicles to operate at up to 20% above the standard limits, i.e. 38.4 tonnes. If this additional weight is safe for the existing 1000 or so such vehicles on the nation's roads, then it must be safe for the rest of the HGV tipper fleet. An increase in the carrying capacity of a four-axle tipper from 20 tonnes to 26.4 tonnes would result in a very significant reduction in the number of HGV lorry movements – almost one third. This would no doubt require some infrastructure improvements in terms of bridge capacities etc. but would result in huge benefits in terms of air quality and congestion.

The biggest challenge facing London is the poor quality of its air.

The congestion associated with London's growth has caused illegal levels of pollution. The current levels of carbon emissions remain unacceptable.

Introduced in 1985, the London Lorry Control Scheme (LLCS) was created to combat the noise and nuisance caused by lorries heading through London in the days before the M25 was fully open. The scheme, in its current form, is designed to encourage lorries to enter London at the same time as most commuters. The resulting congestion is well documented.

TfL's LoCity programme is trying to get the logistics industry to switch to lower carbon vehicles that pollute less. The program is also encouraging industry to re-time deliveries.

By diverting lorries away from restricted roads, the LLCS forces lorry miles up, which increases carbon, NOX and particulate emissions. This is in direct conflict with the goals and considerable efforts of the Mayor, TfL and LoCity.

Although the LLCS looks to address noise as a priority it does not specify the level at which noise becomes unacceptable. This means that a near-silent electric lorry still falls within the scope of the controls.

If the LLCS was abolished, deliveries entering London could be retimed. This would have the effect of reducing the peak hour 'hot spots' that can be seen on the emissions maps.

The recent review of the LLCS resulted in the publication of short, medium and long-term goals. The short-term objectives were focussed on the LLCS brand and the effectiveness of the scheme's communication and engagement. The focus in the medium term is on things like improved signage and the introduction of ANPR to enforce the scheme. Only in the long term is there any mention of the meaningful element, such as official noise standards and how exemptions for the quietest vehicles may be introduced.

We are grateful for the opportunity to provide input into this process and if we can help further please contact the undersigned.

Kind regards

[Name redacted]
[Job title redacted]

Tel: [Telephone numbers redacted]

DAY GROUP LTD
Transport Ave, Brentford, Middlesex, TW8 9HF

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LOGISTICS IS THE NEW RETAIL

Response to the National Infrastructure Commission Freight Study Call For Evidence

Submitted by **DHL, Baytree Logistics Properties (a subsidiary of AXA Investment Managers) and the the UK Business Council for Sustainable Development (UK-BCSD)**

March 2018

Executive Summary

On behalf of DHL, Baytree Logistics Properties (a subsidiary of AXA Investment Managers) and the the UK Business Council for Sustainable Development (UK-BCSD) we are delighted to be able to make this formal submission. Each party is intrinsically linked to the delivery and operation of logistics and freight movement operations across the UK and advocates for the delivery of sustainable development. The UK-BCSD is a branch of the World Business Council of Sustainable Development based in Geneva and operating through 65 national branches to accelerate the transition to a sustainable world.

Logistics facilities and freight movement corridors are vitally important to the long-term competitiveness of the UK, and also the general functioning of our society in the modern world and the ongoing rise of e-commerce. In order to secure the delivery of sustainable development they should be considered to be an essential element of the UK's infrastructure network rather than simply a land use which sits alongside it. Indeed, due to the growth in e-commerce where people buy from websites not physical shops, logistics is fast becoming the new retail sector.

Whilst freight technology will continue to evolve: include platooning, electric vehicles or even movement networks like Hyperloop, the simple fact is that these still require and benefit from the efficient location of logistics facilities and other freight infrastructure. The growth of consolidation centres along with the increase in the need for 'last mile' style smaller facilities have changed the landscape for logistics in the last 20 years and led to an unprecedented need for smaller logistics facilities located near population centres.

By locating logistics facilities in the optimum location, you reduce movement waste, reduce CO_2 creation and increase the ability of both global and local companies to react to the needs of both UK businesses and its residents. In the short term it will also mean that electric freight transport is more feasible in more locations as vehicle ranges are currently limited.

With the political priority for new housing being actively promoted the usual planning balance between housing and infrastructure, in which we include logistics facilities, is being fractured. The concept of sustainable development is misunderstood as simply approving housing without the appropriate infrastructure is wholly unsustainable in the long term as all it does is propagate existing system failures leaving little opportunity to rectify them.

It is therefore key that a national strategy is created where freight and logistics are considered as an integral part of the national infrastructure framework. We would advocate for a national plan to be created which directs development to where it is required to deliver an integrated, sustainable and flexible freight infrastructure network fit for the 21st Century.

Introduction

The effective movement of freight is an essential enabler to growth, prosperity and also sustainable development in the UK. The delivery of sustainable development is a key tenet of the planning system as expounded within the National Planning Policy Framework (NPPF).

The land use planning system is the key tool by which to deliver sustainable development in the UK (subject to the devolved governments supporting any approach taken). It must however be recognised that logistics and freight movements are such that the consideration of issues at the local level is inappropriate and ignores the functional operational framework which now exists and how international, national and regional logistics operates in order to satisfy consumer demands.

It is rightly pointed out that consumers and businesses all rely upon the movement of freight in their daily lives and the demand for freight continues to expand and evolve in the context of constrained infrastructure. As such we believe that to ensure that the UK responds to this challenge, there needs to be a fundamental shift in how logistics and freight is taken account of in the land use planning system.

Logistics facilities/nodes and freight arteries at the international, national and local levels should therefore be seen not just as land use development, making use of the infrastructure network, but as a key part of that infrastructure network in the same way a railway station does and is then viewed as being an opportunity for higher density residential development.

The following sections set out comments in respect of the questions raised in the consultation document.

QUESTION 1

What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?

On behalf of our clients we have identified the following challenges to the road freight sector:

- the efficiency of logistics networks;
- congestion; and
- workforce and skills availability.

THE EFFICIENCY OF LOGISTICS NETWORKS

Market trends and changing business models have meant that retailers and consumers are now focused on the speed of delivery, this is primarily driven by e-commerce and the increasing amount of goods being directly shipped to consumers/businesses on a next day or same day delivery promise. The UK currently has the most advanced e-commerce market in the world. Because of this, logistics companies are developing more nuanced 'hub and spoke' or 'hybrid hub & spoke' logistics networks where locations on the edge of conurbations, within or on key transport routes, are now just as important despite the higher land values because of the increased need for 'last mile' delivery facilities.

As a result, there are now three main tiers to the distribution model: national, regional and local. The general requirements at each level are:

NATIONAL

- 350,000 to over 1,000,000 sq ft;
- Requires ready access to the motorway network; and
- Less than 4 hours drive time to 80% of the country.

REGIONAL

- 150,000 to 350,000 sq ft;
- Requires ready access to fast and reliable A roads or motorways; and
- Located close to a number of major population centres.

LOCAL

- 20,000 to 150,000 sq ft:
- Requires good A road access; and
- Good access to local population centres.

Growing populations and a growing e-commerce demand leads to increased competition for facilities at all levels. Whilst market vacancy rates have fallen to record-low levels in many markets, with the growth of final mile deliveries, the interest in smaller facilities reflects multiple aims within the online retail industry to reduce the final mile delivery times and to be close to end customers. The demand for larger facilities has remained steady but vacancy rates have decreased, increasing the competition as the supply starts to slow increasing costs. With uncertainty about our future trading relationships our clients are concerned about the impact this may have on the UK economy in its broadest sense.

Local planning authorities are currently under great pressure nationally to deliver housing in the right place, but the importance of logistic facilities to support economic growth and satisfy the needs of both commerce and residents is often ignored. Indeed, where new homes are delivered via the planning system or via permitted development additional demand is created. It is acknowledged that warehouses are often resisted locally due to them being large and that they do not generate the same number of jobs as offices. However, automated systems require more highly skilled operators to keep them running and so whilst the job density may decrease, the quality of the jobs created becomes higher.

CONGESTION

At present there is a particular focus on the last mile deliveries (local) as this relates to 50% of the logistic costs, but is least developed in terms of the logistics network and is often the least efficient in term of time and congestion. Congestion has an adverse impact on growth, competitiveness and long-term productivity and environmental considerations such as air quality. By positively thinking about the location of local logistics facilities holistically, the negative externalities can be minimised, and consumer demands satisfied.

WORKFORCE/SKILLS AVAILABILITY

The road haulage sector is the UK's fifth largest employer and facilities need to be located close to a workforce to operate successfully. It is a highly competitive, low-margin business and is service-driven responding to customer demand which fluctuates depending on a number of factors including the rate and location of housing delivery, seasonality and the economic outlook. The clustering of units into large scale logistic parks such as DIRFT, whilst popular for planning authorities to ensure the best use of transport nodes, unfortunately tends to drive up wages as employers compete for a limited pool of workers. A more dispersed strategy would therefore offer both environmental and economic benefits.

THE THREE-TIER DISTRIBUTION MODEL

NATIONAL

Required floorspace

350,000 sq.ft — 1,000,000 sq.ft

Required infrastructure connection

MOTORWAYS

REGIONAL

Required floorspace

150,000 sq.ft — 350,000 sq.ft

Required infrastructure connection

TRUNK ROADS OR MOTORWAYS

LOCAL

Required floorspace

20,000 sq.ft — 150,000 sq.ft

Required infrastructure connection

GOOD LOCAL ROADS OR A ROADS

QUESTION 1.1

What do you see as the key drivers to a successful freight system that is fit for the future?

The key driver to the delivery of a successful freight system that is fit for the future is preventing and reducing the need for movement in the first place. Ensuring development is in the right location is therefore critical. The closer logistics facilities are to clients and suppliers, the shorter the transportation movements will be. This will not only free up the transportation networks but will have huge economic benefits as transportation costs are usually a large component of total supply chain costs. This point needs to be considered against the key transport routes by road, rail, air and sea.

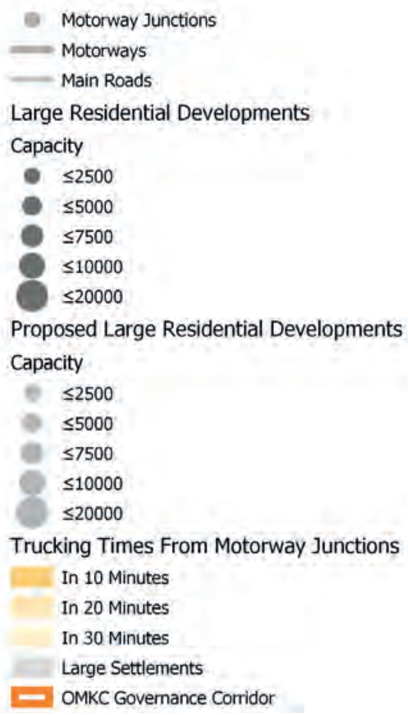
To ensure that logistics facilities are in the right place to reduce movements, logistics needs to be considered holistically with sites allocated in the right place. In the absence of a national and/or a regional plan, Local Authorities must not overlook the fundamental factor of UK logistics' importance and need to thrive in order to feed and clothe the population. When considering non-allocated sites Local Authorities need to look beyond the local need and consider the cross-border, regional and national implications. Government needs to actively legislate to allow for the growth of warehousing space or risk developing a critical pinch point on the country's economy.

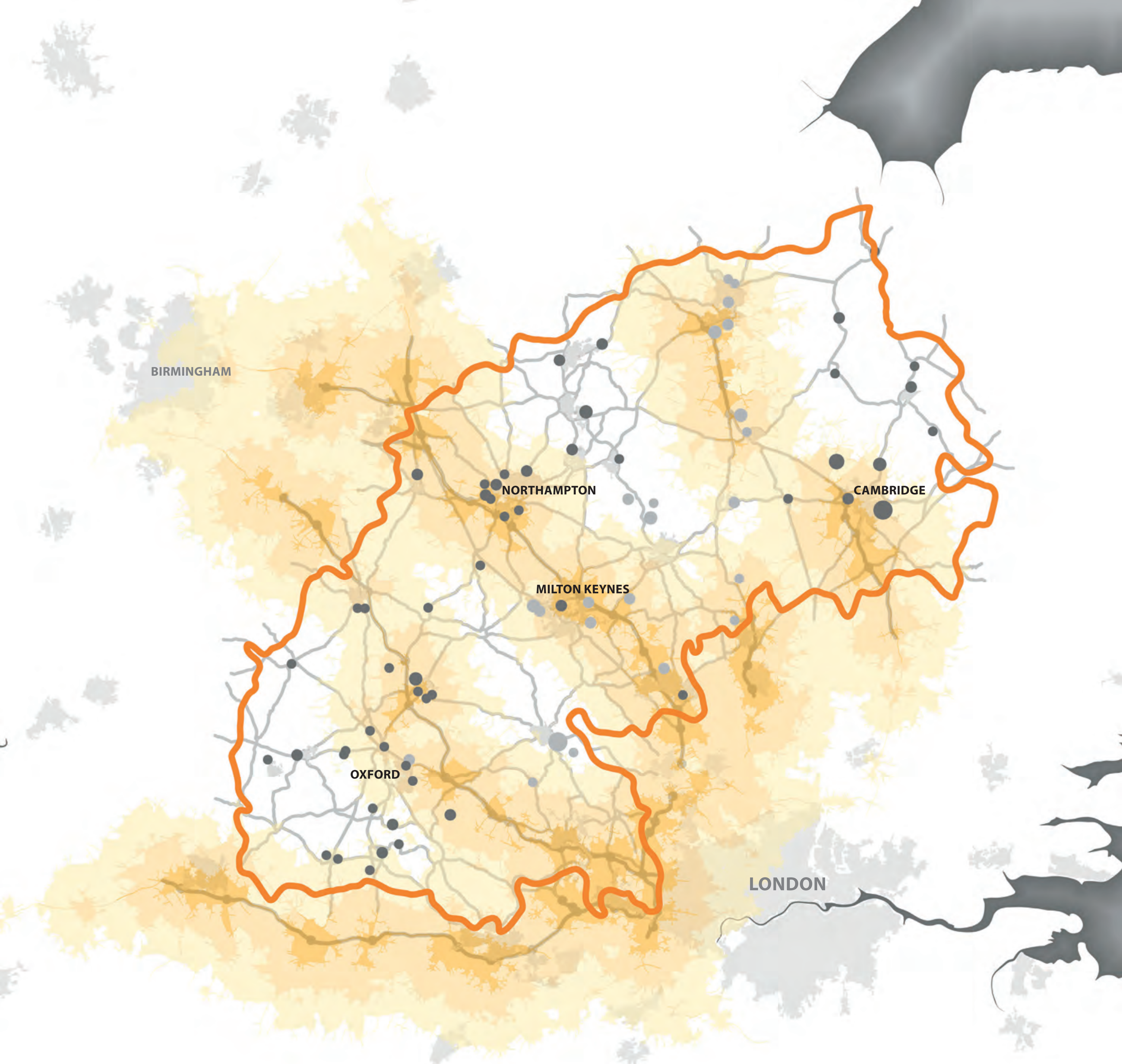
When considering large scale residential developments or wider strategic thinking, policy makers and decision takers need to factor logistics into their considerations, especially the need for smaller scale facilities needed for the 'final mile'. This is particularly important in locations such as Cambridge and Oxford which are surrounded by greenbelt with limited inner-city development space and other constraints such as the historic environment as well as heavily congested roads but where they have young, affluent populations to which e-commerce appeals the most.

A further element of increasing importance as electric vehicles become more advanced and are suitable for the distribution of freight, is the proximity to robust national grid connections. Distribution centres can already require a huge amount of power (refrigeration and automation), as the use of electric vehicles increases this will place further demands on the national grid. Logistics therefore need to be considered as part of national infrastructure from the offset so as to encourage the use of low carbon technologies.

The third element is modal shift from road to rail, where appropriate, as it is more efficient to move goods by rail where long distances are involved. This of course may change when electric vehicles become more prevalent but will still be part of the logistics story come what may. Rail freight interchanges and more particularly rail capacity therefore needs to be considered in full to deliver sustainable development.

TRUCKING TIMES FROM MOTORWAY JUNCTIONS

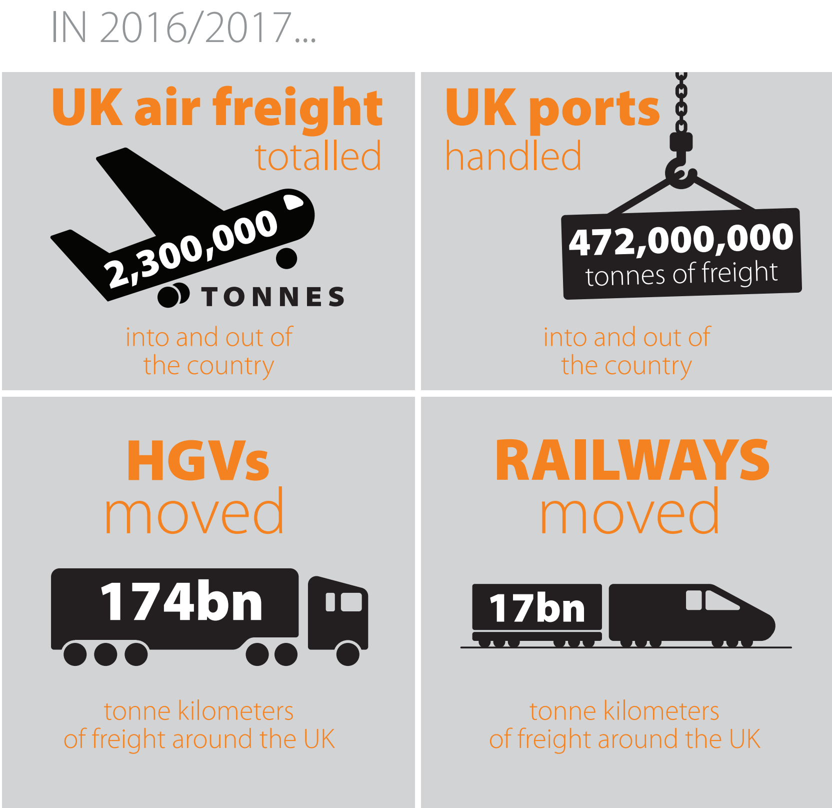




BIRMINGHAM
NORTHAMPTON
CAMBRIDGE
MILTON KEYNES
OXFORD
LONDON

QUESTION 1.2

Which are the key freight corridors that matter the most?

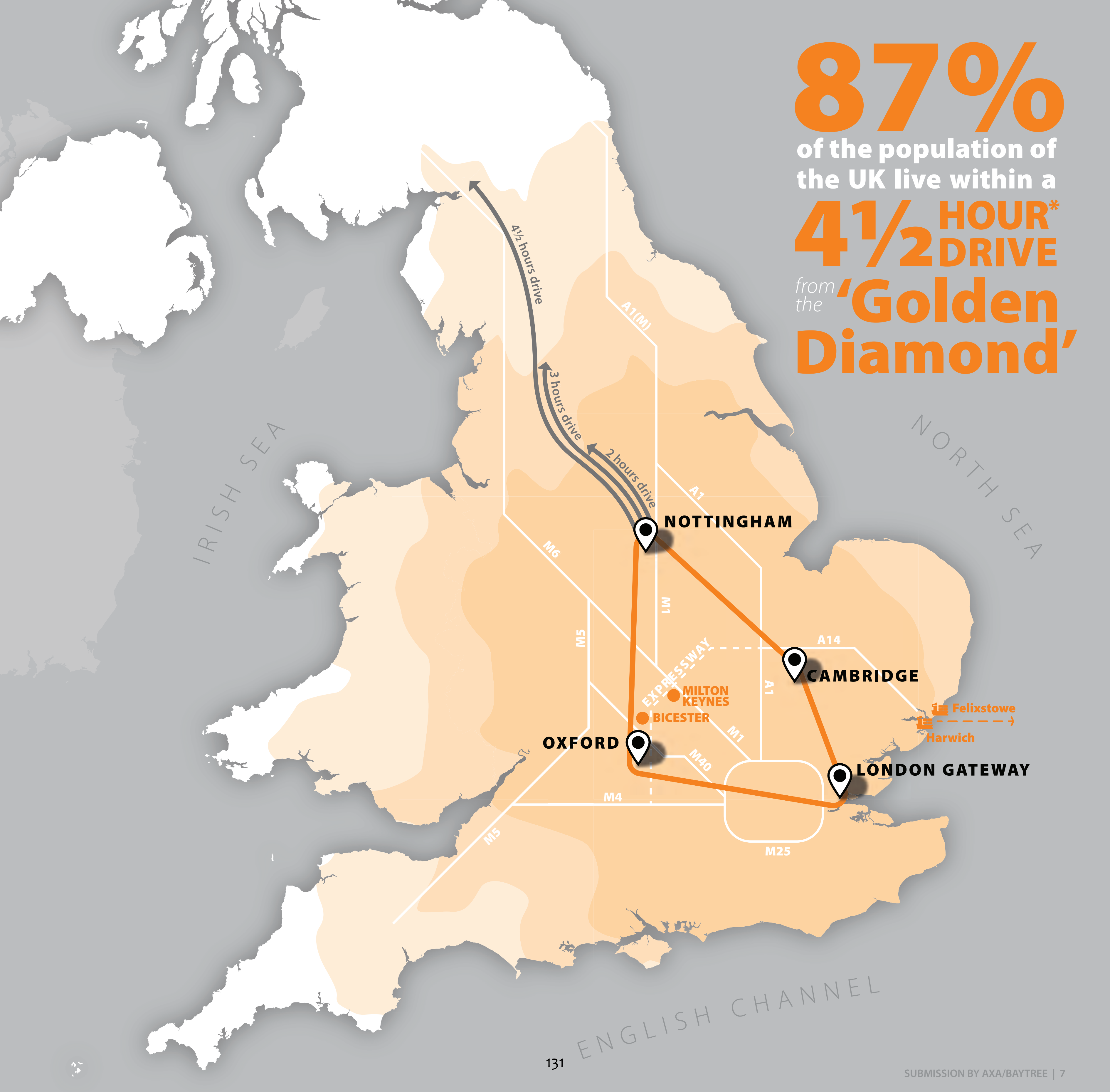


As can be seen in the adjacent graphic, whilst UK air freight equated to some 2.3m tonnes, UK ports handled 472m tonnes of freight, and railways moved 17bn tonne kilometres, the road network accounted for 174bn tonne kilometres, ten times that of rail Whilst key sea and air freight nodes are vital to our international trade and there is a need to make a modal shift of freight onto rail where appropriate, the road network will continue to be the key mode of transport for freight in the UK, especially at the regional and local last mile level.

The 'golden triangle' is an often heard term in logistics circles to describe the triangle of land in the centre of the country, where the location of a logistics facility would allow access to around 70% of the population. Due to changes in how logistics operations work, the triangle has evolved into what can be considered the "golden diamond" to include the Midlands, going as far north as Nottingham and incorporating Luton to the south. From within this "golden diamond" it is possible to reach 87% of the UK's population and all major sea and air ports within a 4.5-hour drive time. Given the expansion of the golden triangle the key freight corridors at a national level which matter most are the M1, M4, M5, M6, M25, M40 and the A1 and A14. Those not the subject of capacity improvements should be shortly to ensure that they are fit for future use.

East-West movements in the UK are generally not as good as North-South links, a point which is especially prevalent where considering access to and from the port cities in the East. The A14 upgrade works will assist in this, as have the additional capacities along the M1 and M6 corridors. The new Oxford to Cambridge expressway scheme which will see a new road between the cities as well as east-west rail link, is a key corridor as well as a key opportunity. This route runs straight through the middle of the "golden diamond" and logistics facilities should be considered as integral to the new road which links high tech cluster, key employment growth areas such as Science Vale, Bicester, Milton Keynes and Cambridge. As this area will also see significant number of new homes, DHL, Baytree Logistics Properties and the UK-BCSD call for strategic joined up thinking to ensure logistics facilities are in the right place to minimise journey lengths and times in order to compliment the new infrastructure and homes proposed in this area.

*based on average speeds for HGVs


87%
of the population of the UK live within a
4½ HOUR* DRIVE
from the 'Golden Diamond'
IRISH SEA
NORTH SEA
ENGLISH CHANNEL
4½ hours drive
3 hours drive
2 hours drive
NOTTINGHAM
CAMBRIDGE
OXFORD
LONDON GATEWAY
MILTON KEYNES
BICESTER
Felixstowe
Harwich
EXPRESSWAY
A1(M)
A1
A14
M1
M6
M5
M40
M4
M25

QUESTION 2.1

What levers might be available to shape future demand for freight transport?

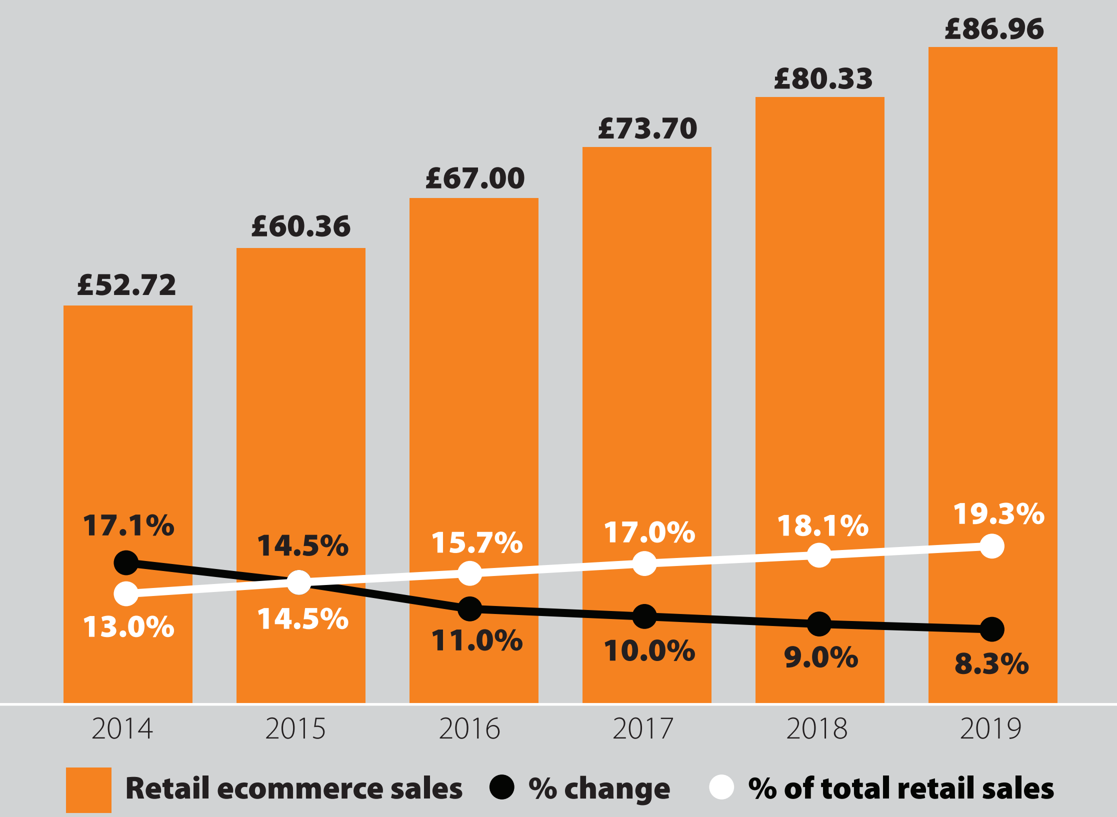
In the new world of e-commerce where people order from websites not bricks and mortar stores, logistics is the new retail. Taking into account the growth in the economy and population forecast over the next 20–30 years it is clear that consumer spending and population increases will be the lead drivers in the increase for the demand for goods and services. With the ever-increasing growth of e-commerce (see below) these journeys are likely to be direct to the customer, resulting in an increase of 'final mile' style journeys and the delivery of smaller packages to individual addresses either by DHL or other delivery services. We see no reason for this trend not to continue and therefore the need for a greater number of facilities will continue.

The current planning system is slow, cumbersome and is largely limited to local administrative or neighbourhoods. The ability to think outside such restrictive boundaries means that there is a growing inability in the system to efficiently plan for logistics in the correct place. If this constraint is perpetuated, then the opportunity to deliver truly sustainable UK development that minimises its environmental impact whilst improving the national economy will be missed.

An important aspect to consider is the chronology of the question. We have advocated in earlier responses the need to allocate land in the right places to optimise the efficiency of logistics networks, however places will grow significantly over a 20–30 year period and therefore space will need to be brought forward to take account of and support changes over this time period as historically quasi government bodies such as the Commission for New Towns and the Development Corporation did in places such as Milton Keynes. Additional research is needed to consider what specific capacities of facilities are required to serve a certain population.

UK Retail Ecommerce Sales, 2014–2019

billions of £, % change and % of total retail sales



Note: includes products or services ordered using the internet via any device, regardless of the method of payment or fulfillment; excludes travel and event tickets
Source: eMarketer, Sept 2015

QUESTION 3.3

With limited space for new infrastructure, how can we better use our existing urban network to support freight?

It is acknowledged that a number of key routes are operating above capacity, equally, there are other roads which are not being utilised due to the lack of joined up infrastructure, inappropriately located logistics development or demand requirements creating pinch points. Whilst legacy issues of development being in the wrong place cannot easily be addressed, shaping future demand will assist in slowly shifting businesses and operations into optimal locations.

In the meantime, the smarter use of existing infrastructure through the use of roads at night, or outside of rush hours will assist in smoothing out congestion through the day and reducing specific stress points on the network. These gaps can often be addressed at a lower cost and more expediently than the delivery of entirely new infrastructure.

Efforts in London to seek the consolidation of deliveries and deliveries outside of core hours has made a huge difference to how new buildings operate in the capital. Such efforts need to be rolled out into other metropolitan areas to harness the benefit of consolidation. Again, ensuring that the spatial planning system is up to speed will be key to ensuring the success of this approach.

QUESTION 4.2

What role do alternative fuels such as electricity, Liquid Petroleum Gas and biofuels have to play?

Electric vehicle development has created momentum over recent years and technology is advancing at pace. There is a huge opportunity for logistics to utilise these technologies going forward with the new Tesla Semi being the first of a new breed of electric HGVs joining a number of smaller 'white van' EVs. At present the obvious place for electric vehicles is when making the final mile deliveries. These journeys are often on the more congested roads within urban areas and would improve air quality by reducing transport emissions.

Transport Minister John Hayes announced on 11 January 2017 that vans will go electric and lorries will run on hydrogen dual fuel under a £20 million government programme to cut emissions. The announcement stated that funding is being given to 20 firms who set out plans for innovative ways to deploy low and zero emission vehicles. Indeed, DHL have pre-ordered 10 Tesla Semi trucks for their US operation. Should this initiative be successful there is potential for similar trucks to be used in the UK.

DHL, Baytree Logistics Properties and the UK-BCSD support the development of technology, but it is considered that the key to enable logistics to utilise new cleaner electric power to deliver goods in the most efficient way is the location of local level distribution centres in the right place in order to reduce journey times.

NATIONAL GRID POWER LINES


BIRMINGHAM
NORTHAMPTON
CAMBRIDGE
MILTON KEYNES
OXFORD
LONDON

Conclusions

The changing face of logistics in the UK has been largely driven by the rise of e-commerce. The movement of goods directly to the door of consumers has led to a rise in the need for 'last mile' style facilities, whilst also changing the general format of logistics operations in the UK. These trends are now established and in order for the UK to take advantage of the opportunities this gives, logistics should be seen as an integral part of the term infrastructure not just a land use.

Locating logistics facilities in the correct places results in more efficient movements, decreased emissions and increased productivity whilst allowing emerging technologies such as electric freight vehicles the best environment in which to thrive. With the 'golden triangle' morphing into a 'golden diamond', and with freight movements being ever more complex, the consideration of these matters at a local scale is inappropriate. We therefore advocate the creation of a UK wide to integrate logistics with growth areas and other infrastructure delivery, to ensure a truly integrated solution is achieved.

Prepared by **David Lock Associates**
50 North Thirteenth Street, Central Milton Keynes, MK9 3BP
www.davidlock.com

RHA The Road Haulage Association

Response of the Road Haulage Association to the National Infrastructure Commission.

"Freight Study Call for Evidence".

2nd March 2018

Summary

1. In late 2017 the Chancellor asked the National Infrastructure Commission to undertake a study into freight in the UK, covering road, rail, water and other modes. The full terms of reference for this study can be found at .
2. The NIC plan to produce an interim report in autumn 2018 that:-
    - assesses the economic impact of freight congestion and the potential benefits of improving freight efficiency;
    - identifies and assesses the new technologies and practices to improve freight productivity;
    - and the value and potential effectiveness of different approaches to reducing the carbon and air quality impact of freight.
3. A final report is expected in spring 2019 to recommend changes to infrastructure, regulation, industry practices, and the government's investment priorities in the freight sector, in order to deliver an efficient and low-carbon freight system over the coming 30 years.

Background about the RHA

4. The RHA is the leading trade association representing road haulage and distribution companies, which operate HGVs as profit centres. Our 7,000 members, operating near to 100,000 HGVs, range from single-truck firms to those with thousands of vehicles. These companies provide essential services on which the people and businesses of the UK depend.
5. We proactively encourage a spirit of entrepreneurism, compliance, profitability, safety and social responsibility. We do so through a range of advice, representation and services, including training.
6. We would like to thank the National Infrastructure Commission for the consultation and the opportunity to comment on the issues raised.

General Comments

7. Freight is of fundamental importance to society. Regardless of mode, road, rail, water or air, the people and businesses of the UK depend upon the effective movement of goods. No house can be built, no car can driven, no factory can work, no bicycle can be bought, no supermarket supplied with food without the need for freight movements. Freight is essential for all of us.
8. Freight is taken for granted by policy makers and infrastructure providers – undervalued, priority is usually given to other things rather than the moving of the goods we all need for our daily lives. We see too many examples where the need to move goods, and the needs of the businesses that do this work, is not properly taken into account by policy makers.
9. For road freight we see examples of this problem. Our members work on the UK road networks every day – it is the place of work for the thousands of businesses working to deliver OUR goods.
10. To highlight just a couple of problems, the lack of parking facilities for driver rest is a disgrace, the levels of congestion are appalling and wasteful, the regulations for the sector are fragmenting and the state of the roads is dreadful.
11. The industry is the home for tens of thousands of successful, mostly small, businesses that only exist because they meet the needs of their customers. It is creative, flexible and adaptable. It is also highly regulated with controls over vehicle design and condition, licensing of all operators, the maximum hours drivers may work and the compulsory requirement for extra training for all lorry driver to name just a few.
12. However, too often we are now seeing new regulatory restrictions being imposed on infrastructure use that wilfully ignores the financial and technical commitments already made by businesses. A lorry has a broad commercial life of about 12 years (more for specialised vehicles) – it is vital that true vehicle life spans are taken into account when making infrastructure and regulatory changes. Failure to do so will result in massive cost and companies being put out of business.
13. The road haulage industry is committed to improving environmental and safety performance. It embraces technology change, and it will always adapt. What it needs is good quality infrastructure and well thought through regulation at local, regional, national and international levels.
14. The Road Haulage Association has focussed our consultation response on road freight. However, many of our concerns will apply equally to other modes.

Responses to Questions

Question 1. What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?

Q 1.1. What do you see as the key drivers to a successful freight system that is fit for the future?

The key driver for efficient movement is congestion free and free flowing traffic. This allows operators to make journeys with consistent timing. Roads free of roadworks, in good condition and with good messaging signage, which is capable of offering alternative routes in the event of serious incidents is needed.

Networks also need to work for drivers. Basic facilities to statutory rest are totally inadequate. In addition there is a lack of toilet facilities – this un unhealthy for drivers who are fundamental to a well-functioning system for moving freight.

Q 1.2. Which are the key freight corridors that matter the most? Where are the bottlenecks in the freight network, and what investments in upgrades could deliver the best value for money for freight efficiency and UK plc?

The Strategic Road Network (SRN) is the key road network, supported by proposed Major Road Network (MRN) roads and priority local authority roads.

There are numerous bottlenecks on the SRN, these are well known to Highway Authorities.

Where the SRN meets the MRN and local authority roads, particularly in the vicinity of motorway junctions, there are significant problems.

Cities and major towns experience considerable bottleneck congestion which needs to be addressed.

Q 1.3. To what extent are the economic benefits of freight factored into wider transport infrastructure investment planning?

We see examples where freight is considered as an afterthought or is simply viewed as a problem. We have concerns that the movement of goods is undervalued in economic appraisal, this should be considered further. Freight connectivity is particularly important for peripheral areas of the UK. Connectivity for business is badly undermined by poor network performance and congestion.

The new draft London Plan is a good example of an anti-freight approach where connectivity and the need to move goods is pretty much overlooked.

Q 1.4. What are the regulatory and legal issues that, if changed, could improve freight efficiency without increasing costs or reducing efficiency?

Reducing the administrative burden of tolls and congestion charges imposed on commercial vehicles will help. Elimination of these unnecessary frictions would improve efficiency (or perhaps incorporating these charges into the Road User Levy). In London change to the London Lorry Control Scheme, introduced in 1986, it is long overdue.

Question 2. How might the demand for freight develop and change over the next 20-30 years?

Q 2.1. How has the demand for freight, and types of freight, changed over the last two decades, and what will be the drivers for changes in the future?

Demand for road freight overall will continue to largely track economic performance. We would expect increased goods movement due to the increase in population and the range of products that are now available to consumers.

The internet has created a demand for changed models of home deliveries, this is expected to continue. Demographic changes, with an ageing population, are likely to be key drivers for future freight requirements, the impact of this needs to be studied. Housing needs will determine what is required in terms of construction materials and once built, consumables for the occupants of these dwellings.

Q 2.2. How is the freight industry planning for future changes in the demand? What levers might be available to shape future demand for freight transport?

The road haulage industry generally operates to current and near term demand. Demand is driven by customers – how freight is moved may be subject to "levers". However, ill-conceived and poorly thought through legislation, such as London's Direct Vision Standard and current Clean Air Zone proposals, show how "levers" imposed on sectors can be very damaging.

Question 3. What effects does congestion have on the efficiency of freight movement and emissions?

Q 3.1. How does congestion impact upon the productivity and economic contribution of freight? To what extent does congestion affect changes to mode, time or other freight choices?

Congestion is undermines the productivity of road freight. It is not just the foreseeable congestion, which can be planned against to some extent, it is the punishing impacts of unreliable journey times. Congestion is wasteful, adds dramatically to emissions and undermines the competitiveness of the UK.

A journey that should take an hour, but takes two hours, doubles the cost in driving time for the driver, increases wear and tear on the vehicle and increased fuel cost – for no benefit at all.
Night time deliveries are used as part of the solution as journey times are predictable for the most part, but they are not always practical. Avoiding known peaks where possible is part of normal routine planning too.

Q 3.2. How does congestion affect the environmental impacts of the movement of freight?
Congestion creates slow moving, or stationary traffic. Free flowing traffic uses less fuel and less concentrated pollution.

Q 3.3. With limited space for new infrastructure, how can we better use our existing urban network to support freight? Are there changes – such as changes to modes, methods, or delivery times - that could help reduce the stress on the urban transport network?
There is not always limited space for new infrastructure. It is wrong to take the idea of new infrastructure off the table as a solution to providing for the movement of goods and people.
We are concerned about the focus on freight as a problem that is implicit in this question. Freight has to be moved, not only that, most of it has to be moved by road. It is rare for freight vehicles to be the major contributor to congestion – it is the victim of congestion in most cases.
Roads are for all road users, making existing road space available by allowing HGV's to use bus lanes may help. Traffic management needs to be focussed on improving journey times and reliability. Where possible, night deliveries should be encouraged not stopped as now happens with the anachronistic 30 year old London Lorry Control Scheme.

Question 4. How can freight lower its carbon and air quality impacts?

4.1. Are there efficiencies within freight management and distribution practices that could help reduce the CO2 and NOx emissions from freight?
Yes. Improvement can be made – but not in all cases.
All efficiency measures will improve CO2 and NOx emissions.
Fuel is the biggest cost to any operator and therefore they will already try to be as efficient as possible when routing and planning. For many, improvements in route planning will help.

Restricted Licence holders are not permitted to collect or deliver goods for third parties. About half the commercial fleet is therefore banned from making any efficiencies regarding backload or complimentary freight movements. This is an area that could be addressed by insisting that all operators have standard operator licenses (for instance many bakery lorries will make deliveries daily and then return empty, with standard operating licenses these vehicles could in fact be used to make collections for other businesses).

There is room for improvement with driver training, but it MUST be targeted and where possible, use telematics to carry out follow ups. Most training is effective initially but there is fall back into old routines over time (in larger fleets we note that businesses that carry out weekly telematics checks and address underperforming drivers have great long term results).

The lack of a cost effective retrofit option for the Euro V fleet and below is now playing havoc with the sector. Euro VI lorries will not be available in sufficient numbers to meet the blanket demands currently being made for Euro VI compliance by all Local Authorities in their Clean Air Zone proposals. The sector need a Retrofit that is funded by Government this will allow the SME's that have older vehicles to retrofit to a recognised Euro VI standard.

Q 4.2. What role do alternative fuels such as electricity, Liquid Petroleum Gas and biofuels have to play? What are the barriers and challenges to wide-scale uptake of alternatives to diesel and what could be done to help remove these issues?

Although other fuels technology may have a large part to play in future, there is no short term alternative to Diesel. Again we would draw attention to the life cycle of a lorry at about 12 years. Uncertainty over local, national and international policy is causing operators to delay purchases of todays Euro VI lorries. Operators need to know that they can use vehicles purchased without substantial new restrictions for their full operating life.

The infrastructure for all other alternative fuels is not in place. The current HGV vehicle park runs into hundreds of thousands of lorries with over 50% still Euro V or below until 2020.

Gas is uncertain and there are current 5 Gas refuelling locations in the UK. We are still unsure that a gas lorry is any cleaner than Euro VI Diesel. Hydrogen electric vehicles may be practical, but that is yet to be clear.

The electrical infrastructure is also lacking, this may be the future but the technology and infrastructure needed is uncertain.

Unless we can be sure that gas options are cleaner and the infrastructure is made available for gas and/or electric then we should look to advance based on Euro VI derivatives.

Q 4.3. What technologies could best and most realistically be utilised to manage the carbon impacts of freight, both within urban areas and on longer strategic journeys?

Improved network performance and resilience through better information and telematics to inform drivers of delays and alternative routes should be a continued priority. This will help to avoid problem areas and to ensure free flowing traffic, thus improving air quality and CO2 emissions.

Medium term, many city deliveries could be made using electric lorries. This will not suit all movements, but the technology and vehicles are coming online quickly now.

For longer journeys rail freight is already successful where it can be competitive, this is likely to continue – but linking to the supplier and the end customer will still usually require road transport. When done with electric vehicles (road and rai) this will also improve carbon performance (providing the grid is low carbon).

Longer and heavier lorries will have the ability to reduce carbon impacts. Double trailer combinations in particular will have a significant impact if a network to accommodate them could be available.

Platooning may give positive results in some circumstances, but in itself is not expected to be significant. (Platooning is important for the possible development of autonomous vehicles).

Question 5. How could new technologies be utilised to increase the efficiency and productivity of UK freight?

Q 5.1. How will new technologies change the capacity and performance of the freight transport network? Over what timeframes might these new technologies begin to affect the freight transport network?

New technology will improve capacity and performance, collision avoidance, lane control and other systems are already doing this. Telematics are constantly improving and each new vehicle has improved on the previous model. As far as timeframes go, this is already happening.

Q 5.2. How can the use of data such as real-time traffic information by artificial intelligence and machine learning systems help to improve freight efficiency and

productivity? How might this affect the business models and requirements of freight in the future? Are there any barriers to the greater use of data in freight?
Real-time information is already used and will develop and improve over time. AI is still in its infancy and is already used in warehouse environments. Provided Data Protection principles are adhered to, data can be used for the benefit of everyone.

Q 5.3. How do you see technologies such as HGV platooning, digital railway signalling, and autonomous vehicles being integrated into freight distribution?
The platooning technology is in its infancy, and will have to be fully evaluated. Current platooning is not likely to be the end state – it is a step on the way towards autonomous vehicles. The potential is there, if the benefit is worthwhile industry will embrace these concepts.
It should be noted that autonomous vehicles will not reduce the customer requirements for goods to be moved, so demand for freight transportation is not expected to reduce.

Q 5.4. How might regulations and physical infrastructure need to adapt to new technologies and business models in the freight sector?
Regulation needs to be proportionate and sensible, to ensure it works for new technologies and is enforceable by deterrent measures.
Regulatory changes must not undermine the value and utility of existing equipment prematurely and without clear justification. The current policies around Euro VI mandating for clean air zones is a great example of how damaging measures can be introduced (with good intentions) if industry asset life is ignored.
Physical infrastructure should be able to accommodate new technology, however technology can fail and resilience is key to success. Safety for all road users is of fundamental importance for all new technology investments.
Picking winners in the technology arena is going to be very difficult. Caution is needed around speculative new technology investments. Sometime we may be better off fixing simple things like potholes and sign rather than grand uncertain projects.

Question 6. Are there good examples internationally of freight systems, policy, infrastructure or technology development and implementation that the UK can learn from to increase freight efficiency and/or reduce the carbon and congestion impacts?

France is a good example of a road infrastructure that has been properly planned and sufficient investment made, where there are many resilience routes and minimal congestion. Cities and large towns have ring roads and there are few pinch points. Those that do exist work well to encourage free flowing traffic. Free flowing traffic is the solution to congestion and air quality issues. Congestion causes pollution.

Final Comment

15. The customer is key - a lorry only moves if a customer wants a product and is willing to pay for the collection or delivery. Accommodating freight demand needs to be at the heart of all infrastructure planning.

2nd March 2018
[Name redacted]
[Job title redacted]
Road Haulage Association
[Email address redacted]

Response to call for evidence on NIC Freight Study

Dr Tim Marshall

School of the Built Environment

Oxford Brookes University

Introduction

I am glad to have the opportunity to pass on some thoughts on this study, because I think it is an excellent moment to look at this whole question, and I am confident that it will be an important element in the working through of the NIC position on long term transport needs, not yet fully reflected in the work on the NIA so far. It will be clear that I am not a freight expert in the sense that a few academics are, let alone in the other sense of being a professional or business person in the field. But I hope that I can contribute on some angles that others may not cover in the same way.

The field does appear to be rather **a poor relation**, compared with so much work on other aspects of movement. I realise this may be almost a cliché by now, but I think it could be proven for both the amount of government effort that has gone into the field in recent years, and for the work by academics on this in its many facets, as against on passenger traffic by any mode, or other parts of the transport agenda[i]. One reason, on the academic side, may be the common one of it being implicated in several disciplines and mind sets – engineering, logistics, economics, management, ecology and so on – and that these have not been working on the issues effectively together, despite the wealth of knowledge held by individuals in each of these and related fields. I may be proven to be wrong on the size of these research gaps, if you get an impressive range of integrated responses to the call for evidence. But my guess is that there is a need for some further directly UK oriented research, which clearly your study cannot wait for, but which should be flagged up, if that turns out to be a finding.

My sense is that some **other countries** which have been working particularly on economic efficiency and green agendas for many years (the usual suspects, Netherlands and Germany) could contribute something in the meantime from their experience. Perhaps holding a meeting in the Netherlands (as in the Rotterdam academic centres like Erasmus University) or in one of the leading German research institutes might help, if this can be engineered at this time of difficult relations with European partners. I cannot myself point immediately to key publications, but no doubt UK freight specialists will have the contacts particularly in those countries. Naturally the OECD type agencies (especially ITF) may have some intelligence, but going direct to key national institutes might be more effective.

The lack of integration affecting research no doubt affects **government management** of the issue which falls within (or should fall within) the remits of several departments and agencies, despite the leading role of DfT. Certainly BEIS, Defra and MHCLG should be very much involved in creating and implementing policy directions. More thought than in the past needs also to be given to the wider vertical and diagonal **governance relationships** in this field, set by the capacities of local authorities and the new bodies with which they are involved (STBs, CAs).

Thinking about freight and freight policy

As we have been told endlessly, for a good number of years now, freight is about logistics, a wider activity than just moving goods around. The implication of this is equally straightforward, that public policy on freight has to include a full understanding of logistics. This means that the relationship to environmental and land use questions should be central, not peripheral as it risks being if too narrow a lens is adopted for study. This is naturally particularly relevant for my main interest, which is the link to developments in the planning system, and the relationship to land use change.

Another implication is that logistics now includes **a large speculative property sector**, with little direct interest in public policy goals in the sense pursued by the NIC, but a powerful drive to maximise profit generation through upward valuing of land and property. As with housing land, the multiplier from farm land value can be very considerable, and adds up for a 500 or 1000 acre development, as can be the case for Strategic Rail Freight Interchanges (SRFIs).

The transformation of areas of previously rural England into **warehousing complexes** next to motorways and trunk roads is well known to anyone travelling these roads regularly. Most famously Northamptonshire became a centre of such "warehousing and distribution" from the 1970s onwards; about 7% of employment is in the logistics (warehousing and transport) sectors, around double the national average. But this part of Midlands England known as the Golden Triangle covers several counties and affects every day a considerable number of people and economic activities, with large social and environmental impacts. The creation of these large zones may be the largest example of poor territorial management represented in the industrial field. It is a process which is ongoing, with SRFIs being promoted under the 2008 Planning Act, creating yet more warehousing complexes which would probably not be permitted under Town and Country Planning Act arrangements. I add, at the end of this response, a short (unpublished) commentary on what might be done about the SRFIs policy zone[ii].

One reason why it is so important to address this dimension of freight (the spread of massive warehousing complexes which generate heavy pressures on the motorway and trunk roads system in particular parts of England) is the impact it has on **land use**. Since the 2010 Foresight Study there has been no significant study of how land is used in England (some work has been carried out in Scotland). Particularly with the prospect of changes on farming policy, it is important that the warehousing dimension is factored into the discussion of what land should be used for, questioning whether quite productive farming land should be used for these purposes.

One way of summarising much of what I am arguing here is to state that a "whole economy" approach is needed to this question, not one confined within the to my mind narrow confines of transport and technology thinking.

Comments on some of the consultation questions

I leave most aspects to those more expert on particular details of the operation of freight businesses and on technological change affecting the industry.

Question 1

In my view a good freight system would look nothing like the existing one in the UK or in other countries I am familiar with. Here as often my view may appear utopian, but the wise practice of the NIC to focus on at least 2050 means that deep and radical possible changes should be at the core of the study, not tinkering with details (important though those will certainly be in trying to generate short term change). My view is probably a fairly standard green one, not especially original, but as no UK government has ever adopted anything on these lines, it is worthwhile to state the bare bones again.

The **first feature of an improved freight system** would be far less goods being taken around the country. The basic way to do this is by reducing consumption. There is a large literature on how this might begin to be done, in ways that would generate as much or often more well-being across the population. Removing a large slice of the excess consumption of material goods would be likely to have an especially large impact on the level of imports, and so take pressure off sea and air travel and off the entry points, ports and airports. So there are gains all round. At the same time a more circular economy reduces the need for land fill or energy from waste schemes, and incentivises that goods are produced in more durable forms[iii].

Another potential generator of less freight movements can be by producing more goods nearer where they are consumed, within the UK. This is likely to be harder to engineer, particularly when fuel costs are so relatively low, in comparison to the overall cost of products. The long discussed use of energy or carbon taxes of many kinds has remained politically difficult, and so that avenue, the most powerful path to encouraging localisation of production over long periods (shifts would be likely to be over decades), is not an easy one to take. Other instruments, directly encouraging certain forms of food production or other essential needs production in particular parts of England and the UK, may also help to reduce the demand for freight, and at the same time give greater security and resilience in these systems. Again consideration of such steering or supporting instruments would be helped by the presence of a properly considered land use policy for Britain, which does not exist. Given the fear of international turbulence generated by dangerous international relations policies in key global states, this emphasis on local goods security might be a politics with some support in coming years.

Hence **industrial strategy and energy policy** are highly relevant to freight policy. For years much freight movement on rail was dominated by coal moving. That can be avoided by using other fuels, whether for example gas or LNG (both in part by pipelines, arguably a better form of freight movement), or by use of electricity, maybe from renewables (again electricity transport can be seen as a better form of freight movement). All this may seem too large and long term, but in fact there have been significant recent changes within quite short periods of time, such as the collapse of the coal element in rail freight, which show that sometimes important changes can happen quite fast. But again industrial and energy policy should surely in any case be looking long term to 2050 and beyond.

The **second feature of a good freight system**, as I see it, beyond less movement of goods, would be more use of sustainable modes. The creation of a massive motorway and big trunks road system between the 1950s and the 1980s, well able to take heavy goods traffic, alongside a range of policies related to planning, continued low fuel costs and allowing ever larger goods vehicles on roads, caused the domination of road freight, in Britain as in virtually all modern and modernising states. The failure to invest fully in rail and water modes during much of the twentieth century clinched the shift. In my view a core element of government policy to 2050 should be to reverse this, generating considerable modal shift in all areas where this is possible. As I have argued before in commenting on the October 2017 NIA document, to rely on the clean-electricity-powering of road freight as the way to avoid the need for modal shift to (primarily in the UK) rail, seems to be a high risk strategy, likely to fail. I suspect it would leave the large proportion of freight still carried by fossil fuel powered vehicles (aeroplanes and trucks, platooned or not) in the 2040s. Certainly there will be limits to the "ultimate" proportion that can shift from road to rail in a small country like Britain, but these limits are surely a very long way from the present situation.

A programme of work was begun in the early 2000s to make the UK rail system fit for freight of contemporary forms, especially inter-modal. This programme needs to be developed and resourced, not carried out at the slowest possible rate. As I understand it (and I am sure the Rail Freight Group and academic rail experts will give the details), this is not difficult in principle. It should be far easier technically than the current drives for autonomous vehicles, platooning and so on, and should have no problematic and unexpected side effects, because the process and results are tried and tested.

This should take place alongside proper study of the rail freight terminals needed. As my survey of SRFIs policy evolution makes clear, these were seen in the early 2000s as most likely to be needed only in a very few regions and in small numbers, with the South East the region with the most need. The East Midlands, where most of the large speculative warehousing (and rail terminals) schemes are now clustering, was not seen as a region in need of new terminals, with DIRFT (extended as needed, as has occurred) seen as quite adequate for that part of England. The policy of leaving this element of rail freight policy, and therefore freight policy generally, to private initiative needs to be changed, based on a proper study of needs. The Sub-national Transport Bodies do not appear to see this as part of their remit, so a study will need to be done at a national level.

Question 2

As in the past, freight demand will be driven in major part by public policies and decisions. The key now as in the past should be to **manage the demand for societal gain**, not assume that by simply meeting a mysteriously evolving demand, the government has done its job. I am sure the NIC will make good use of scenario approaches to consider really radically different demand possibilities, and not depend on industry assessements or simple extrapolations of past patterns of growth or decline.

Question 3 (3.3)

My view that urban planning policy is integral to considering freight futures can be applied easily enough as well within towns. The present productive discussion of how to deal with local deliveries, whose growth has been so large in recent years, is tied directly to changes in both retailing and to labour market policy which has promoted self employment and so the creation of vast numbers of very small businesses. Online retailing is part of the same process, which does not fully take into account the externalities generated by this very big change in provisioning of households and commercial entities. One possible response might be that market forces must be given full play to make the changes required, linking this to charging for all public goods (urban road space in particular). But this is impossible in practice, given the inherited and limited spaces which actually exist, as well as a range of other factors of a distributional or ethical kind. Charging elements are naturally already present, but regulation of various kinds will be the effective response, in the real urban world.

Planning policy has, or has had, a role in steering retail development. This has been very difficult in an era of the dominance of car based travel, within towns as well as more widely. So the study may wish to consider the role of changes to planning policy and practice which could reduce certain dysfunctional incentives. One is the attraction of creating very large stores and warehousing systems, which cause enormous amounts of movement. Within the big retail groups this takes the form of now a few macro-regional warehouses. An example is the Marks and Spencers cathedral-like development at Castle Donington, opened in 2012 on the basis that within a year or two at most, all delivery would be by rail. But the rail siding has not been used. On the customers side, the long distance retail phenomenon partly reflects the force of inter-town retail competition. A shopper in Oxford will be encouraged (by low fuel prices, cheap or free car parking and so on) to travel to shops in Milton Keynes, Reading and Swindon, for example, for fairly normal purchases. A gradual return to localised provisioning, supporting very local centres and town centres, would help to reduce the amount of cars and vans on urban roads, at least for some parts of retailing. Again I am aware that this is politically difficult, especially given the power of retail groups. A range of fiscal and regulatory instruments would be needed to push behavioural changes, above all by the large retail groups which structure both production and consumption, but also by small businesses and individual customers.

This may seem far from freight prospects. But tackling these matters of big scale urban design, or regional planning, depending on the issue, would be as important as a more close up focus on urban delivery issues, over these timescales.

The short term

I appreciate that most of the above refers to longer term structuring factors, which will affect what is the short term in 2025 or 2030, but may look rather abstract to present policy makers. One way to move forward may be to argue for **immediate experimental ventures** in a range of spatially varied contexts (from the most metropolitan to the most rural), to press forward innovative approaches over say a five year period. At such city regional or sub-regional levels, ideas may emerge which can make a short term difference. This use of experimental programmes is very embedded in the German federal system, as in the MORO programmes, which tackle different issues every few years, by encouraging model schemes to tackle each issue. The approach admits that new ways to deal with some issues can sometimes emerge from specific localities, if some funding and other support is given by the higher level of government.

Strategic Rail Freight Interchanges (SRFIs), an outsider perspective

Creating the fast track

The 2008 Planning Act was originally designed for infrastructure schemes of "national significance". As commentators said at the time, this phrase was wide open to interpretation. The 2007 White Paper had its sights essentially on big energy schemes, airports and big road schemes. At the last minute, for some reason, rail schemes were added in, carrying on their back "Strategic Rail Freight Interchanges", seen by some as key to shifting freight from road to rail. Perhaps work done by the Strategic Rail Authority promoting the idea of big Rail Freight Interchanges and the pressure of lobby groups like the Rail Freight Group convinced ministers that SRFIs deserved to join the fast track. This was a distinct oddity then, allowing the approval of massive warehouse schemes, overwhelmingly road served, as being "nationally significant".

One reason behind this change was the experience of the LIFE scheme at Colnbrook in Slough, next to Heathrow, in the early 2000s. This had been refused on green belt grounds (and an appeal lost in 2002), and a similar scheme (SIFE) promoted by Goodman was similarly turned down in 2016 (though further legal challenge may emerge). Developers and their advisors have struggled in the London region to understand whether their schemes will be judged as "nationally significant enough" to over-ride green belt considerations[iv]. Up to now one big London borders scheme (Radlett) has been approved, in 2014, one is still not quite there (Howbury Park). All these schemes have used the normal town and country planning route, and some observers have judged that if the 2008 Act route had been used, they would now have all been home and dry, and with less uncertainty, delay and waste of time and resources on all sides[v].

However it is vital to understand that the context for the operation of the 2008 Act regime has changed a great deal, as well as the Act itself being significantly reformed. All regional and strategic planning was abolished in 2011, meaning that the schemas intended to guide the selection of the best SRFI locations ceased to exist. This resulted in a "free for all", allowing developers to argue that their scheme would help modal shift. Changes under laws in 2013 and 2015 have brought business, commercial and housing (so far up to 500 houses) schemes into the 2008 Act regime. It could be argued therefore that gradually "national significance" becomes anything developers feel they may have difficulties with under the ordinary town and country planning system. We will see where the interpretation dynamic ends up – hardly any local decision making?

Recent schemes

Figure 1 lists the schemes already decided and those expected under the 2008 Act procedures. Two schemes have been approved under this regime - DIRFT 3 (2014), and the East Midlands Gateway Rail Interchange (2016), the latter against the examining inspector's recommendation. And there are now at least two schemes near Northampton (Rail Central and Northampton Gateway) vying to be the first to make an application for consent, and one in the West Midlands (West Midlands Interchange) not far behind, with others in the wings, including Hinckley. Each of these schemes is enormous, around 200-300 hectares, with 500-800,000 square metres of warehousing – numerous football pitches with cathedral high buildings on them. All would be equipped with rail access, but, as opponents have noted, there are no conditions that force the large scale use of these rail facilities, and the evidence of existing warehouse complexes is that rail use is a minor part of the freight systems serving them. An example is the M&S mega warehouse at Castle Donington, very close to the East Midlands Gateway scheme. This was built in 2011, with the rail siding, but no trains have used the rail facility, despite promises by M&S that the warehouse would be largely rail served by 2015.

Who gains, who loses?

Whose interests has all this served? The logistics industry in the Midlands is gaining profitable new sites, which by their motorway locations will no doubt deliver good results for the global investors behind these schemes. But for many other societal interests, these processes have been much more problematic. In the South East the lack of clarity has probably been frustrating for almost everyone: schemes are emerging with juddering slowness – virtually nothing in 20 years - in what has been regarded (since the SRA 2004 report) as the key region for rail freight. Local groups like those objecting to the East Midlands Gateway scheme, and now the Northampton schemes, have to work against the odds to get their arguments to have effect on decisions. Local authorities, in the absence of any regional (or national) steering, have often taken a resigned position in the face of the 2008 Act procedures, leaving local opposition groups on their own; though those in the South East such as Slough and St Albans have been much more combative, and have tended to have support from their MPs. The Inspectorate has arguably been placed in some very invidious positions, trying to weigh up poorly framed guidance. Most centrally, from the perspective of society as a whole, the policy of modal shift is hardly any closer to being achieved; there is little prospect of creating an efficient rail freight system, along this track.

Revising national policy

Legal commentators have noted the confusion over this area of planning policy, suggesting that existing unclear guidance in the National Networks NPS needs to be revisited. There is little sign that the emerging Sub-National Transport Bodies will take on this role. Transport for the North and Midlands Connect appear to have other priorities, ready to rely on the current round of speculative applications to deliver an appropriate rail freight system – whatever that would look like[vi]. Surely it is time to examine the whole evolution of SRFIs and the planning of rail freight systems more generally, not just hope that the investment preferences of the big sheds industry will magically deliver an efficient rail freight terminals and lines system. Such an examination should then propose a revision of the National Networks NPS, giving it geographical guidance, rather than relying on unclear criteria. It was these unclear criteria that enabled the approval of the East Midlands Gateway scheme, as they were interpreted differently by the examining inspectors and the Secretary of State. They have also complicated the lives of the Inspectors tasked with balancing large uncertainties against green belt impacts, particularly when considering London border schemes.

In the meantime, it would be desirable for a moratorium to be called on SRFI applications, so that the massive investments proposed are not wasted on developments in the wrong locations. Such a moratorium is hardly going to bring the warehousing development industry to its knees. Big approvals, like that for DIRFT 3, take a good time to implement. The impact of the new schemes near Northampton will probably mean some existing warehouse users will move to the new spaces, leaving empty warehouses elsewhere, whilst some rail traffic will be removed from the nearby and still under-utilised DIRFT[vii]. The essential rail gauge changes proposed by Network Rail since the early 2000s are being built far more slowly than anyone had hoped, meaning that in some routes (above all out of Felixstowe), little more intermodal freight traffic can be accomodated for the moment. It is time for government to take a serious look at the whole policy area (unlike the lightweight policy paper produced by the Department for Transport in September 2016[viii]), and synchronise planning policy with rail investment policy, if any real progress on putting more freight on the rail system is to be made in the 2020s. Rail freight interests themselves might stop hoping for spontaneous generation of a system by means of current style SRFIs and press for proper analysis and policy guidance.

Project name	Location	Developer	Landowner	Size (hectares)	Square metres	Dates
Daventry International Rail Freight Terminal	Weedon, between Daventry and Rugby	Rugby Radio Station Ltd Partnership and Prologis UK	BT	345 (DIII)	731,000 (DIII) 360,000 (DI), 180,000 (DII)	DIRFT I opened 1997, DIRFT II under construction, III approved July 2014, preparation work on this phase began 2016.
East Midlands Gateway Rail Freight Interchange	Near Castle Donington, south of Nottingham and Derby	Roxhill (Kegworth) Limited	Charles Coaker	224	557,414	Approved Jan 2016. Construction work began early 2017.
East Midlands Intermodal Park	Egginton, between Derby and Burton	Goodman Real Estate (UK) Limited	Not known	255	550-570,000	Consultation in 2014 but then stalled
Hinckley National Rail Freight Interchange	Near Hinckley (M69, Burbage Common)	DB Symmetry	Not known	315	Not known	Expected submission Q2 2019
Northampton Gateway Rail Freight Interchange	Milton Malsor south of Northampton	Roxhill Developments Limited	Not known	? c 250	468,000 and 155,000 mezzanines	Launch April 2016, expected submission Q2 2018
Rail Central	Milton Malsor south of Northampton	Ashfield Land Limited	Ashfield claim much owned or optioned	240	? c 700,000	Launch Jan 2016, expected submission Q2 2018
West Midlands Interchange	Near Cannock, South Staffordshire	Four Ashes Limited (Kilbride Holdings and Grosvenor Group)	Piers Monckton	260	c 800,000	Launch April 2016, expected submission Q4 2017

Figure 1 SRFI projects in England - those on PINS website March 2018

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Wilsmeister G, Monios J and Lambert B, 2011, The directional development of intermodal freight corridors in relation to inland terminals, *Journal of Transport Geography*, 19, 1379-1386.

Woodburn A, 2008, Intermodal rail freight in Britain: A terminal problem?, *Planning Practice and Research*, 23, 3, 441-460.

[i] From my perspective the most helpful work has been in the geographical and planning fields. I am sure a literature review has been done, at any rate one place to start is this recent survey, Cui J, Dodson J and Hall P, 2015, Planning for urban freight transport: An overview, *Transport Reviews*, 35, 5, 583-598. This contains a good range of references, including the transport geography work of J-P Rodrigue, P V Hall and Markus Hesse. They bring out the interaction of cities and freight at all spatial scales, from the global to quite local.

[ii] I have also written an account of the generation of this policy, as I could find no adequate description of how this situation had come to be. However this is ten pages long, and so too long to submit here. In any case, others may not be as interested in the freight terminals policy as I am. I can of course supply this later if wanted.

[iii] I notice the logistics industry is now at least talking about circular economy, to go by a recent book: C Weetman, 2017, *A circular economy handbook for business and supply chains*, Kogan Page, London.

[iv] Simon Ricketts's highly informative blog at https://simonicity.wordpress.com/category/rail/

[v] *Planning Magazine* 29 July 2016 page 10.

[vi] Presentations and discussion at the WEET meeting on 11th May 2017, Policy priorities for the freight sector: regional devolution, international trade and regulation.

[vii] See the highly knowledgeable analyses on the Stop Rail Central webpages. http://www.norailinterchange.co.uk/

[viii] Though this was accompanied by a useful AECOM/ARUP report on *Future potential for modal shift in the UK rail freight market*, September 2016 http://www.arup.com/railfreightmarket), which pointed to many measures needing action – little of which got into the DfT paper (DfT, 2016, *Rail Freight Strategy: Moving Britain Ahead*, DfT, London, September 2016).

Railway Industry Association
22 Headfort Place
London SW1X 7RY
United Kingdom

Telephone: +44 (0) 20 7201 0777

E-mail: ria@riagb.org.uk
www.riagb.org.uk

March 2018

NATIONAL INFRASTRUCTURE COMMISSION FREIGHT STUDY CALL FOR EVIDENCE

1. INTRODUCTION

1.1 This letter constitutes the formal response from the Railway Industry Association (RIA) to the above call for evidence.

2. BACKGROUND TO RIA

2.1 RIA is the trade association for UK-based suppliers to the UK and world-wide railways. It has over 200 companies in membership. The UK rail sector employs some 600,000 people and contributes annually £36.4 billion Gross Value Added (GVA). It is also a growing industry with the number of rail journeys expected to double over the next 25 years and freight set to grow significantly too. RIA's membership is active across the whole of railway supply, covering a diverse range of products and services and including both multi-national companies and SMEs (60% by number). RIA works to promote the importance of the rail system to UK plc, to help export UK expertise around the globe and to share best practice and innovation across the industry.

2.2 RIA provides its members with extensive services, including:

- Representation of the supply industry's interests to Government, Network Rail (NR),TfL, HS2, ORR and other key stakeholders
- Providing opportunities for dialogue and networking between members, including a number of Special Interest Groups
- Supply chain improvement initiatives
- Provision of technical, commercial and political information every week
- Export promotional activity, through briefings, visits overseas, hosting inwards visits
- Organising UK presence at exhibitions overseas.

3. RESPONSE TO QUESTIONS

3.1 Rail plays a significant role in UK trade, not least as a key supplier to many industrial sectors, including container logistics, power generation, steel, automotive production, ports and shipping, construction, retail and petrochemicals.

Scope of the study

3.2 RIA was disappointed that the terms of reference for the study set by the Chancellor mean issues relating to border controls and customs, and issues relating to the UK's exit from the EU, are out of scope, i.e. the study will not consider how Brexit might affect the country's need for new rail freight infrastructure. This may be a missed opportunity if customs arrangements post

Brexit result in a sterile corridor for customs clearance, which requires new infrastructure such as rail stock yards.

Infrastructure

3.3 To help maximise the opportunities for UK rail freight infrastructure post Brexit, it is important that there continues to be sustained investment in maintaining, enhancing and expanding our rail freight network. This includes both the Channel Tunnel and the rail freight distribution network within the UK, which provides the means for a significant flow of cross border trade between the UK and continental Europe. It has been estimated that a total of £47.8 billion of imports, which equates to 22% of the value of UK imports from EU countries, and £43.7 billion of exports, which equates to 30% of total value of UK exports to EU countries, passes through the Tunnel each year[1].

3.4 In terms of infrastructure more generally, ensuring good rail freight connectivity and capacity at ports, container hubs and airports will be vital to supporting supply chain links and getting the most of existing investments in these facilities.

Rail freight market

3.5 The Office of Rail and Road (ORR) regulator 2016-17 statistics show consistent expansion in the key consumer and construction rail freight markets with record levels of traffic[2]. Rail freight is worth £1.6 billion a year to the UK economy; each year the rail freight industry carries goods worth over £30 billion[3]. Increasing rail freight is an important part of the Department for Transport's (DfT) policy to reduce freight's emissions and help the UK meet its legally binding Climate Change targets[4].

Carbon emissions

3.6 There is a significant opportunity to reduce transport emissions by shifting freight to rail. Rail freight has a key role to play in the low carbon economy as rail produces 76% less carbon dioxide emissions than the equivalent road journey[5]. Furthermore, the **total greenhouse gas emissions from rail (including both freight and passengers combined) are less than 2% of total UK transport emissions**.

Resilience

3.6 We would recommend that the study looks at resilience, particularly given the expectation of more frequent and more extreme weather events, such as flooding and heatwaves, as these can have an impact on the operation of rail (and other transport) infrastructure.

Congestion relief

3.7 The movement of multi-modal goods from ports by rail, in particular at the ports of Felixstowe and Southampton, is key to reducing congestion on motorways and in the port environs. An important feature of this success is the availability of inland freight terminals to facilitate final distribution.

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[1] https://www.eurotunnelgroup.com/uploadedFiles/assets-uk/the-channel-tunnel/EY-Channel-Tunnel-UK.pdf
[2] http://www.freightonrail.org.uk/factsfigures.htm
[3] http://www.freightonrail.org.uk/FactsFiguresRailBoxes.htm
[4] DfT Rail Freight Strategy September 2016
[5] http://www.freightonrail.org.uk/factsfigures.htm

3.8 Bulk materials, aggregates, biomass, refuse, and construction waste, for example, are best moved by rail, due to the sheer volume of material to be moved. Many of these products are used/generated in cities; chronic congestion on roads would result if delivery by road was implemented as an alternative.

3.9 Until recently, there has been no question of the popularity/environmental benefits of getting lorries off motorways and diverting this traffic to rail. It is hard to see how platooning lorries along motorways will do anything other than increase congestion and pollution, while creating chaos and safety issues at interchanges.

For more information, please contact RIA [Job title redacted] [Name redacted], at [Email address redacted] and [Telephone number redacted].

Bury House, 1-3 Bury Street,
Guildford, Surrey GU2 4AW
tel: 01483 569263 fax: 01483 577379

Freight Study Call for Evidence
National Infrastructure Commission
5th Floor
Eastcheap Court
11 Philpot Lane
London
EC3M 8UD

Submitted by email to: Freightstudy@nic.gsi.gov.uk

23rd February 2018

Dear Sir/Madam,

NIC Freight study

Kilbride Rail (Kilbride) is an infrastructure developer specialising in the rail sector. The team at Kilbride has been responsible for attracting a number of key customers to rail freight and has delivered rail freight terminals for the JLR plants at Castle Bromwich and Halewood, the BMW plant at Cowley, other car manufacturers at Corby and other sites. We have also promoted and secured a land allocation at Tavistock for the development of 750 residential units linked to the reinstatement of the Bere Alston to Tavistock passenger rail line. We also own an interest in the Swindon rail freight terminal currently let to Honda and Network Rail and we are promoting amongst other projects a strategic rail freight terminal (SRFI) with up to 8 m square feet of logistics space at West Midlands Interchange.

I am a non-Executive Director of the Rail freight Group and so should declare that interest.

The wider Kilbride group also has interests in the energy sector delivering a number of renewable energy projects for UK manufacturers.

Kilbride welcomes the NIC’s engagement in the Freight Study commissioned by the Chancellor. The resulting recommendations should be achieved without jeopardising the short term delivery of infrastructure projects currently underway or in the planning application phase.

We have concentrated on a few of the topics set out in the Call for Evidence where our expertise in the rail freight sector lies.

1. What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?

Capacity constraints exist on key UK strategic road network points which combined with some outdated locations of logistics centres have constrained the efficient movement of freight. Land allocations for logistics uses have been slow to come forward through local planning authorities and existing allocated land has come under pressure from residential developments removing or delaying the supply of new well located freight sites.

1.1. What do you see as the key drivers to a successful freight system that is fit for the future?

The UK requires well located modern logistics centres with adequate large scale building footprints that improve the efficiency of supply chains and reduce road delivery legs.

1.2. Which are the key freight corridors that matter the most? Where are the bottlenecks in the freight network, and what investments in upgrades could deliver the best value for money for freight efficiency and UK plc?

Constraints exist on the strategic road network and at certain points of the rail network. Combined co-ordination of the planning of the capacity improvements of both networks would assist in making best use of constrained financial resources. Investments in parts of the rail network for instance could help relieve congestions at pinch points in the road network and vice versa.

Locations serving the Midlands and London require the greatest interventions together with key sections of the WCML north of HS2's connecting point to the national network.

1.3. To what extent are the economic benefits of freight factored into wider transport infrastructure investment planning?

The National Policy Statement for National Networks attempts to highlight the case for the economic benefits of new road and rail freight projects, but is limited in its ability to encourage new projects.

1.4. What are the regulatory and legal issues that, if changed, could improve freight efficiency without increasing costs or reducing efficiency?

There could be more flexibility on open access for rail operators to rail freight terminals across the country.

2. How might the demand for freight develop and change over the next 20-30 years?

We support the forecasts for Freight set out in the Department for Transport's Freight forecasts and the Network Rail Long Term Planning Forecasts.

2.1. How has the demand for freight, and types of freight, changed over the last two decades, and what will be the drivers for changes in the future?

The drivers for change will be the changing demographic makeup of the UK, as new residential areas are developed to address housing shortages. Larger Shipping vessels entering the UK ports require faster logistics routes that can handle the related changing flow of container numbers. This change has resulted in the need to clear ports much more quickly as the containers from 17,000 TEU vessels can only be cleared from the port through the use of rail. The trend of ever larger vessels may continue this development in the freight market.

2.2. How is the freight industry planning for future changes in the demand? What levers might be available to shape future demand for freight transport?

The Strategic Freight Network Fund can address capacity pinch points and should be extended into the future with greater certainty on its future. Grant funding to assist new flows onto rail would also help to address particularly congested road routes.

Finally an equal treatment of road freight costs would help to address an imbalance in the current market, whereby HGV owners currently pay little, if anything, towards the costs of the road network through road tax measures.

3. What effects does congestion have on the efficiency of freight movement and emissions?
N/A

3.1. How does congestion impact upon the productivity and economic contribution of freight? To what extent does congestion affect changes to mode, time or other freight choices?
N/A

3.2. How does congestion affect the environmental impacts of the movement of freight?
Congestion increases the impact of freight movements on the environment. The use of rail freight with 15 times lower NOx, 90% lower PM10 emissions and 70% lower CO2 levels per tonne of freight than road should be further encouraged.

3.3. With limited space for new infrastructure, how can we better use our existing urban network to support freight? Are there changes – such as changes to modes, methods, or delivery times - that could help reduce the stress on the urban transport network?
N/A

4. How can freight lower its carbon and air quality impacts?
The Rail Freight Group is leading an initiative to look at how the rail freight industry can further reduce its carbon and air quality impacts. Additional electrification of the rail network would help as would certainty on its delivery so that investment in locomotive improvements can be planned with confidence.

4.1. Are there efficiencies within freight management and distribution practices that could help reduce the CO2 and NOx emissions from freight?
The wider development of a network of SRFIs would help to improve the management of freight across all modes and reduce the impact on the environment by being able to have the volume and scale to commit to more rail movements.

4.2. What role do alternative fuels such as electricity, Liquid Petroleum Gas and biofuels have to play? What are the barriers and challenges to wide-scale uptake of alternatives to diesel and what could be done to help remove these issues?
All these fuel type could play a part in the future of freight if policy is set out on a long term basis and supply networks are established in advance.

4.3. What technologies could best and most realistically be utilised to manage the carbon impacts of freight, both within urban areas and on longer strategic journeys?
Rail freight already generates significantly better environmental and congestion results than road but new technology is still needed on locomotive haulage power be that alternative fuels or greater use of battery power. Platooning of road vehicles may have a small part to play in

tackling congestion but at present there are no workable solutions for the UK road network. Further evidence should be produced of its possible impact.

5. How could new technologies be utilised to increase the efficiency and productivity of UK freight?
See above.

5.1. How will new technologies change the capacity and performance of the freight transport network? Over what timeframes might these new technologies begin to affect the freight transport network?
Greater use of digital technology for use on the National rail network could significantly improve capacity if the technology is deliverable.

5.2. How can the use of data such as real-time traffic information by artificial intelligence and machine learning systems help to improve freight efficiency and productivity? How might this affect the business models and requirements of freight in the future? Are there any barriers to the greater use of data in freight?
N/A

5.3. How do you see technologies such as HGV platooning, digital railway signalling, and autonomous vehicles being integrated into freight distribution?
See above.

5.4. How might regulations and physical infrastructure need to adapt to new technologies and business models in the freight sector?
See above.

6. Are there good examples internationally of freight systems, policy, infrastructure or technology development and implementation that the UK can learn from to increase freight efficiency and/or reduce the carbon and congestion impacts?
N/A

Other comments

The results of the NIC's freight study may have an impact on current proposals for new SRFIs, which are in the planning system or are in the stages of delivery. It would be helpful if the NIC considers how its statements impact on current projects of this type that depend on policy support developed over a number of years, before any recommendations are set out.

The policy background of the National Policy Statements should be kept in mind in this process, unless the NIC wishes to jeopardise the delivery of current Nationally Significant Infrastructure Projects in this sector.

The rail freight market has seen a number of dramatic and fundamental changes over the last 10 years, which do not appear to have been set out in the short summary of rail freight in the National Infrastructure Assessment (NIA). It is an important sector for the country's economy delivering goods to markets, supporting manufacturers and the delivery of aggregates to the key housing and construction markets. The rail freight sector currently delivers £1.7bn of economic benefits to the country's economy each year.

The sector has undergone a dramatic change as a result of two factors, the recent closure of coal fired power stations and the significant capture of port to inland terminal containerised traffic by rail.

Network Rail and the DfT's own rail freight forecasts identify how the medium term demand on the network can be accommodated. Planning of this nature is necessary for the delivery of private and public sector investment in rail related infrastructure.

A significant part of the future rail freight demand is dependent on the quality and locations of proposed SRFI, that are transforming logistics operations. These infrastructure projects require continued official support in the medium term to achieve better efficiencies and productivity from supply chains by basing the logistics operations close to conurbations and the necessary infrastructure thereby removing extra road trunk legs.

The confidence in the detailed and substantial work carried out on National Policy Statements (NPS) to help deliver infrastructure projects should not be undermined by statements from the NIC in this consultation.

Research by Campaign for Better Transport on behalf of Department for Transport showed that on key corridors including the A14, A34 and parts of the M6, rail freight is moving the equivalent to 10-15% of current freight traffic, whilst facilities such as the strategic rail freight interchange at Daventry removed 64 million road miles last year. Rail freight has captured over 30% of the market of container traffic from the main UK ports. The research also shows that expansion of rail freight could have a significant impact on current and projected congestion on the roads in those corridors.

I hope that the NIC study on the future of freight will provide a vision for the sector's future and help it to achieve its potential.

Yours faithfully,

[Signature redacted]

[Name redacted]
[Job title redacted]

West Midlands Interchange

Contactus@communityrelations.co.uk
Free helpline: 0800 3777345

Freight Study Call for Evidence
National Infrastructure Commission
5th Floor
Eastcheap Court
11 Philpot Lane
London
EC3M 8UD

Submitted by email to: Freightstudy@nic.gsi.gov.uk

23rd February 2018

Dear Sir/Madam,

NIC Freight study

Four Ashes Limited (FAL) promoting a strategic rail freight terminal (SRFI) with up to 8 m square feet of logistics space at West Midlands Interchange.

I am a non-Executive Director of the Rail freight Group and so should declare that interest.

FAL welcomes the NIC's engagement in the Freight Study commissioned by the Chancellor. The resulting recommendations should be achieved without jeopardising the short term delivery of infrastructure projects currently underway or in the planning application phase.

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See above.

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I hope that the NIC study on the future of freight will provide a vision for the sector's future and help it to achieve its potential.

Yours faithfully,

[Signature redacted]

[Name redacted]

[Job title redacted]

Hutchison Ports (UK) Limited
Tomline House, The Dock, Felixstowe
Suffolk, IP11 3SY, United Kingdom
T +44 (0) 1394 604500
F +44 (0) 1394 604949
www.hph.com

Freight Study Call for Evidence
National Infrastructure Commission
5th Floor
Eastcheap Court
11 Philpot Lane
London EC3M 8UD

By email: Freightstudy@nic.gsi.gov.uk

5 March 2018

Dear Sir/Madam

National Infrastructure Commission Freight Study Call For Evidence

Hutchison Ports is the port and related services division of CK Hutchison Holdings Limited, one of the largest inward investors in the United Kingdom. It operates the world's leading port network with over 30,000 employees and operations in 52 ports spanning 26 countries throughout Asia, the Middle East, Africa, Europe, the Americas and Australasia.

In the UK, Hutchison Ports owns and operates the Port of Felixstowe, Harwich International Port and London Thamesport.

The Port of Felixstowe is the largest container port in the UK. In 2017 the port handled over 4 million TEU of container traffic, 40% of all containers handled in UK ports. In addition, the port handles over 250,000 ro/ro freight movements each year and is the country's largest intermodal rail freight facility. Its three rail terminals handled over 1 million TEU of intermodal rail freight in 2017.

Harwich International Port is a leading ferry, passenger and offshore wind support port. London Thamesport handles containers, general and project cargoes and is situated on the Isle of Grain in Kent.

Approximately 75% of the traffic handled at the Port of Felixstowe, a substantial majority of traffic at London Thamesport and, other than small quantities of liquid bulks, all traffic currently handled at Harwich International, is transported on the Strategic Road Network (SRN). 28% of Felixstowe's container traffic is transported by rail although this proportion increases to 50% for traffic to the West Midlands and North. Traffic is also transhipped by coastal feeder services to the North East and Scotland. Although a relatively small part of the total mix, coastal feeders carry a significant proportion of traffic to these markets.

In response to the NIC's call for evidence, we would like to submit the following comments grouped under the five main questions asked in the Call for Evidence:

1. *What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?*

Registered in England & Wales No. 03484910
Registered Office: Tomline House, The Dock, Felixstowe, Suffolk, IP11 3SY, United Kingdom.

- There has been a significant increase in the size of container ships operated on the world's major trades accompanied by a further consolidation amongst container ship operators. The largest ships are now able to carry between 18,000 and 21,000 TEU (Twenty foot Equivalent Units) and are 400 metres in length. These are increasingly the norm on the Europe-Asia trade, the world's largest. As they have been introduced, ships in the 10,000-14,000 TEU range that had previously been used on this trade have been cascaded onto other routes replacing smaller vessels.
- As vessel size, and the volumes of containers they carry, has grown, the ability of inland infrastructure connections at key ports to accommodate the increasing volume of trade is a growing constraint.
- Increasing vessel sizes and consolidation within the international shipping industry has seen traffic consolidate in fewer key hub ports. Larger volumes at a few major ports allow public investment in port connectivity to be better focussed delivering better value for money.
- Rail freight offers a means of moving large volumes of traffic quickly. In 2017 the Port of Felixstowe handled over 1 million TEU by rail in a single year for the first time. Demand for intermodal rail freight continues to grow strongly and rail volumes at Felixstowe have doubled in a little over 10 years.
- The majority of rail traffic through Felixstowe is destined for the West Midlands and the North. Whilst 28% of containers overall are transported by rail, the rail share is 50% to these key markets.
- Scale is important to a successful rail offering. There are 66 freight train movements per day at Felixstowe including 10 departures and 10 arrivals per day to each of the key markets in the Midlands, North-West and Yorkshire. The high frequency of service makes rail a more viable option for importers and exporters and creates a virtuous circle where greater frequency generates an even greater level of demand. The continued ability of Freight Operating Companies to access the national network during the daytime is essential to rail remaining an attractive option for shippers.
- Future growth in rail volumes will be constrained without further investment in the national network, particularly the Felixstowe to the North (F2N) route. Approximately 1.5 million TEU moves between Felixstowe and the North each year making Felixstowe the Northern Powerhouse's most important route to overseas markets for container traffic. Improvement to F2N is crucial to the rebalancing of the economy.
- Capacity on the network must be balanced by capacity at inland rail terminals to avoid constraints across the network. Inland terminals must be made common user terminals instead of single operator terminals.
- The bottlenecks on the route are well known and have been identified through Network Rail's enhancement processes. The sections that require upgrading include the Felixstowe Branch Line, the Haughley junction, capacity at Ely, the Ely to Soham section and at Leicester. Work to increase capacity on the Felixstowe Branch is due to start this year and feasibility work for the interventions required at Haughley, Ely and Soham are at different stages of maturity. It is important that all these projects are delivered as soon as possible.
- Elsewhere, additional passing loops at strategic locations can help increase capacity on the network.
- The rollout of digital signalling across the network will increase the number of paths available and boost capacity. The return on investment of using digital signalling will be significant as a result of the additional capacity that will become available.

- Scheduled intermodal freight services operate from Monday to Friday during the working week. An increasing number of 'specials' are operated on Saturdays but there are no freight services on Sundays. Moving to a seven day railway, which the port could easily do, would significantly increase overall capacity.
- The economics of rail means that it is only competitive at distances of over approximately 150 miles. Road therefore remains the most important mode for the distribution of freight in the UK including containers from the Port of Felixstowe. The overwhelming majority of traffic from Harwich International and London Thamesport also moves by road.
- The Port of Felixstowe is connected directly to the Strategic Road Network (SRN); the A14 starts at the port's Dock Gate No.1. Harwich International Port is also connected directly to the SRN at the Eastern end of the A120 and London Thamesport is connected to the SRN at the A2/M2 via the A228.
- Hutchison Ports welcomed the publication of the Department for Transport's consultation on Highways England's Initial Report as part of the Roads Investment Strategy 2 (RIS2) process. In particular, the proposal to develop a network of Expressways, beginning with the A14 between Cambridge and Huntingdon, is a positive move for the transport of freight.
- The Initial Report recognises that users want a SRN that is safe, free-flowing, supports economic growth and improves the environment. However, it fails to reflect the benefits of good port connectivity. The importance of port connectivity is recognised in the Port Connectivity Study work currently being undertaken by the Department for Transport, the Government's Industrial Strategy, the Transport Investment Strategy and the CBI's Shaping Regional Infrastructure report. It should also be reflected in the RIS2 priorities.
- Road bottlenecks on routes important for freight include A14 Orwell Bridge, A12, A120 and A428. Resilience is an issue on A14 and Expressway proposals need to be expedited to maximise operational efficiency.

2. *How might the demand for freight develop and change over the next 20-30 years?*

- Overall total freight tonnage handled by UK ports has declined in recent years; by 3% in 2016. This decline is attributable mainly to changes in energy policy and a large reduction in demand for coal imports. Despite this, steady growth has been experienced in unitised traffic which saw its fourth consecutive year of growth in 2016, continuing what has been a steady long term trend. The majority of forecasters predict a continuation of this pattern with containerised trade continuing to grow more strongly than other sectors in future.
- The impact of Brexit is unclear but the increasing focus on trade with third countries, and the possibility of entering into new trade deals, may well increase levels of containerised trade above previous predictions.
- Felixstowe was the first port in the UK to handle the latest generation of mega-ships and continues to handle more of them than any other UK port; 167 in 2017. The largest ships are currently up to 21,000 TEU capacity but a further increase, to approximately 24,000 TEU, has been speculated upon.
- The concentration of ownership and increasing physical size of ships will result in deep-sea container traffic being even more concentrated in fewer ports in future. Transport corridors connecting mega-ports with the main areas of production and consumption will therefore need to be the main focus for investment in future.

- At the same time as the average size of container ships is growing, the number of calls is decreasing. A greater volume of containers are arriving on fewer ships creates greater peaks and troughs in container flows. This, in turn, presents challenges for terminal operators and intermodal providers.
- The Port of Felixstowe's £40 million investment in its third rail terminal, the North Terminal, which opened in 2013, has enabled longer trains to operate to/from the port. These trains, capable of carrying 90 TEU each, improve the operational, economic and environmental performance of the network.
- Demand for rail remains strong. As congestion grows on the road network, more rail-connected inland distribution centres are constructed, and road haulage driver shortages get worse, the demand for rail freight is expected to continue to grow.

3. *What effects does congestion have on the efficiency of freight movement and emissions?*

- Although the Port of Felixstowe is open 24 hours a day during the working week for the delivery/collection of containers by road, the majority of vehicles still arrive during the day shift. Road deliveries are much lighter on Saturdays and virtually non-existent on Sundays. A more even level of landside demand over 24 hour cycle would reduce congestion on networks.
- There are alternatives to road and rail for some freight flows and containers are also distributed from Felixstowe by coastal feeder vessels. Although these constitute only a small proportion of the total, it represents a significant proportion of traffic to the North East and Scotland and reduces the impacts of congestion on land-based modes as well as the environmental impact of freight.
- The demands of freight on national road and rail networks can be mitigated through the use of port-centric logistics; where containers are unstuffed at ports and the contents distributed directly from there. This cuts out the journey through an inland distribution centres by taking products directly to stores/local fulfilment centres.
- The geography of the UK and the nationwide nature of demand mean that port-centric strategies are likely to remain niche and the bulk of traffic will continue to travel through large distribution centres. A disproportionate number of these are located in the Midlands which offers a central location and good connectivity. The A14 corridor is particularly important for this traffic.

4. *How can freight lower its carbon and air quality impacts?*

- Many parts of the freight industry are already taking measures to reduce their carbon and air quality impacts. Hutchison Ports is continuing to invest in new technology and initiatives to reduce its carbon footprint and to ensure port users have access to the most sustainable supply chains.
- The Port of Felixstowe is accredited to the ISO 14001 (2004) Environmental Management System [EMS] and ISO:50001 (2011) Energy Management System [EnMS]. Both the EMS and the EnMS are fully integrated into the daily running of the business and are supported at the highest levels of the organisation.
- The application of the best standards in environmental management coupled with a large number of initiatives designed to minimise environmental impact has resulted in

reduced Green House Gas emissions, with CO2e per unit down 4.4% since 2015-16, and a 33% improvement since 2008-09.

- Continuous investment in cleaner technologies and effective traffic management solutions have borne great improvements in air quality, despite increased port throughput. An Air Quality Management Area located near Dock Gate No.2 has been formally revoked by Suffolk Coastal and District Council as a result of greatly improved Nitrogen Dioxide and Sulphur Dioxide concentrations. Overall, Sulphur Dioxide (SO2) concentrations have reduced by 90% since the baseline year in 2009. Nitrogen Dioxide (NO2) concentrations were also observed at a ten year low, with a 40% reduction on 2007 levels.
- Route optimisation software, such as that provided by Hutchison Ports' Paris operation helps to reduce empty miles by optimising and triangulating to find the optimum route combinations which help reduce carbon dioxide emissions from transport.
- Sulphur Dioxide reductions are due, in part, to the North Sea Sulphur Emission Control Area (SECA). Ships in the SECA should not use fuel with a sulphur content in excess 1.5% m/m unless fitted with an Exhaust Gas Cleaning system or other technological method. The SECA only covers the South and East coasts. An extension to cover all UK waters would reduce sulphur emissions from shipping, and improve air quality, at West coast ports as well. Given the direction of the prevailing winds, these benefits may extend a significant distance inland.
- Rail freight produces 76% less carbon dioxide than road freight. Greater use of rail will help reduce carbon emissions and improve air quality but benefits would be greater if the F2N route was electrified. It has been estimated that the carbon savings derived from the use of rail at Felixstowe are twice the level of the port's own emissions.
- The environmental benefits of rail freight from Felixstowe are probably greater than the norm due to the longer than average trains and the high utilisation of those trains; average load factors of 85% are achieved at Felixstowe, i.e. the majority of trains are full or almost full.
- Continued Government support for both rail and coastal shipping will be important in helping the freight industry to minimise its carbon and air quality impacts.

5. *How could new technologies be utilised to increase the efficiency and productivity of UK freight?*

- The UK has a large trade imbalance in goods. This presents challenges to road and rail hauliers matching inbound and outbound loads and can result in significant levels of empty running and repositioning of containers. Route optimisation software, such as that provided by Hutchison Ports' Paris operation helps allocate resources in the most efficient way and helps reduce the impact of freight on the road/rail network.
- Digitalisation and transparency will allow better planning of freight traffic and therefore we must work hard to make all supply chain players embrace the use of digitalisation.
- It is currently unclear what impact autonomous vehicles might have on the movement of freight. The economics of platooning are likely to favour large volumes flows like those at the Port of Felixstowe but, from a port perspective, understanding how platoons would be marshalled at either end of the journey needs to be better understood.
- The use of Variable Message Signs (VMS) has helped deliver real-time information to drivers allowing them to make informed decisions to improve journeys. However, with an

increasing number of vehicles connected to the internet and with satellite navigation systems, there is the prospect of delivering better tailored advice more directly to drivers to further improve the efficiency and productivity of freight.

We hope that this contribution is helpful and would be happy to expand on any of the above if necessary. We look forward to continuing to contribute to the work of the National Infrastructure Commission on this important matter.

Yours sincerely

[Signature redacted]

[Name redacted]
[Job title redacted]

NATIONAL INFRASTRUCTURE COMMISSION
FREIGHT STUDY CALL FOR EVIDENCE

The questions the Commission is particularly keen to focus on in this initial phase of work are as follows. You may wish to respond to all or any of the below:

1. What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?

Road bottlenecks that cause daily congestion for example A10 leading to A14. There is a daily 5 mile queue. This in transport land is 'acceptable' but for local people and businesses is it really unavoidable? What's worst is the knock on to the surrounding road network as people and LGV's try to avoid and put further pressure and risk onto minor roads. Is it by design?, better to have long queues on the A10 than additional pressure on the A14? Is it so that commuters will be deterred form using cars and take the park and ride? If this is the case then the existing P&R is in the wrong place as its 4 miles towards the end of the queue.

1.1. What do you see as the key drivers to a successful freight system that is fit for the future? Further investment in capacity. We run freight trains and have two rail facilities but are only able to run 75% of the freight that we need. HS2 should take away some of the passenger traffic that hopefully enables us to run more freight traffic BUT in 10 years.......The strategy and number of parties involved needs to be streamlined. Duelling of the A11 took 20 years, The Felixstowe to Midland rail strategy. The Ely element still needs doing so the final benefits aren't reached until it's done

1.2. Which are the key freight corridors that matter the most? Where are the bottlenecks in the freight network, and what investments in upgrades could deliver the best value for money for freight efficiency and UK plc?

A47 Midlands to Great Yarmouth would improve routes and traffic taking pressure off the A14. A12 Ipswich to M25 needs investment and more lanes. The A120 duelling from Colchester to Stansted again cross country east to west routes are important as the Cambridge to Oxford road and rail enhancements.

1.3. To what extent are the economic benefits of freight factored into wider transport infrastructure investment planning?

If freight and people can be moved efficiently then the investment is rewarded by improvements in productivity and GDP. It's not a sexy concept when faced against the NHS/Education/Social care BUT if the 'engine' works better it will provide money in taxes to pay for them.

1.4. What are the regulatory and legal issues that, if changed, could improve freight efficiency without increasing costs or reducing efficiency?

We need to simplify the process, reduce the number of elements in the process or prioritise the importance of sum so that decisions are made quicker. There needs to be an over arching strategy that focuses on the dependency of the various component parts. It's only when the hole route is sorted that you get the benefits, so focus on completing and take the political pain of spending only in certain parts but set a long term pipeline (30 years) so that everyone can see when stuff gets done

2. How might the demand for freight develop and change over the next 20-30 years?

    2.1. How has the demand for freight, and types of freight, changed over the last two decades, and what will be the drivers for changes in the future?

    Rail for Freight will still be needed but diesel locomotives should be replaced, hopefully better technology will enhance this. Running larger rail cargoes should be the ambition. Over 20 years we have moved from 1,100t cargoes to 1,560 tonne. The first 2,000t cargo was run this year into East Anglia but it's only on 3% of the trains. The Class 59 'Jumbo' train regularly runs 3,300t from the Mendips into London where it's split. The constraints are often at the loading end and the grant system needs to be resurrected to help iron out these bottlenecks.

    Platooning of longer LGV cargo's will enable more goods to be moved. Out of city distribution points that enable warehousing with onward lower capacity 'electric' deliveries into our cities.

    2.2. How is the freight industry planning for future changes in the demand? What levers might be available to shape future demand for freight transport?

    Better infrastructure will be required if the industry is to move to electric LGV's as the norm. This should be done now so that the industry gets confident that its the way to go. In 5 years time there will be affordable electric LGV's available BUT the take up will be low unless the infrastructure supports it.

3. What effects does congestion have on the efficiency of freight movement and emissions?

    3.1. How does congestion impact upon the productivity and economic contribution of freight? To what extent does congestion affect changes to mode, time or other freight choices? Congestion is WASTE but a function of poor capacity. If the capacity is improved then waste inevitably will reduce and productivity will increase. Movement to Euro6 will help drive emissions down as the engine is 100 times better for NOx. Policies to get old vehicles off the road are needed. It has happened twice already in London with a further round to come. Businesses have managed to keep up and stuff still gets delivered. None of us would have done it off our own back but we have.

    3.2. How does congestion affect the environmental impacts of the movement of freight? Lack of capacity is the root cause to congestion. Auto on/off works for cars and is available on some trucks but should be mandated, engine idling for our industry is very poor, in my business we have worked hard to reduce but still run at 10% because of driver behaviour is very difficult to change.

    3.3. With limited space for new infrastructure, how can we better use our existing urban network to support freight? Are there changes – such as changes to modes, methods, or delivery times - that could help reduce the stress on the urban transport network? All things should be considered although the UK 'Safety' lobby will try to undermine strategies like hard shoulder running. We must now have long tern evidence of things such as variable speed control etc, If it works we should do it.

4. How can freight lower its carbon and air quality impacts?

Move more to rail and ship for the long distance running. Drive change to modern Euro6 trucks, look at switching LGV to electric in the future

4.1. Are there efficiencies within freight management and distribution practices that could help reduce the CO_2 and NOx emissions from freight? Out of city distribution centres where large LGV cargo's are then broken up and delivered on electric van to the city

4.2. What role do alternative fuels such as electricity, Liquid Petroleum Gas and biofuels have to play? What are the barriers and challenges to wide-scale uptake of alternatives to diesel and what could be done to help remove these issues? Network capacity, currently too few. For SME hauliers to take up LPG then there needs to be a network of LPG fuel stations. The price of LPG needs to be at 'Total investment cost' over 5 years to be CHEAPER than diesel.

4.3. What technologies could best and most realistically be utilised to manage the carbon impacts of freight, both within urban areas and on longer strategic journeys?

Electrification across the freight sector to include rail freight. Out of city distribution centres that enable smaller 'electric' deliveries into towns as the 'norm'

5. How could new technologies be utilised to increase the efficiency and productivity of UK freight?

5.1. How will new technologies change the capacity and performance of the freight transport network? Over what timeframes might these new technologies begin to affect the freight transport network? First need to decide what is 'best' for the next century LPG or Electric. Then need a strategy that gets it established within 10 years so companies are confident to start the switch. Once mobilised the industry will embrace.

5.2. How can the use of data such as real-time traffic information by artificial intelligence and machine learning systems help to improve freight efficiency and productivity? How might this affect the business models and requirements of freight in the future? Are there any barriers to the greater use of data in freight? Company telematics systems record and report everything, most are linked to live traffic to help routing but only if the 'driver' utilises them. Platooning would help ensure take up and new 'platooning' vehicles could be mandated to have the 'best' systems and they always have to be used.

5.3. How do you see technologies such as HGV platooning, digital railway signalling, and autonomous vehicles being integrated into freight distribution? If there is a will hopefully we will find a way. The public may be the biggest hurdle and whatever we do it has to be safe unless we can separate from the public which in the UK will be impossible.

Anything that increases speed reduces congestion and the size will help. Why don't we move to 50t gross vehicle weight on Euro6/7 vehicles? Would this encourage the industry to change?

5.4. How might regulations and physical infrastructure need to adapt to new technologies and business models in the freight sector? LPG fuel station network, High capacity quick LGV charging stations. Set a target an additional 1,000 per year for the next 10 years.

6. Are there good examples internationally of freight systems, policy, infrastructure or technology development and implementation that the UK can learn from to increase freight efficiency and/or reduce the carbon and congestion impacts?

There are in Rail Freight where countries such as France and Germany have put in high speed passenger infrastructure that inevitably has increased capacity for rail freight.

Most countries with good infrastructure have found a way of funding it. In its bluntest that they have a tax/toll system where the users fund the investment. In the case of Haulage this will inevitable have to be passed to the end consumer who will be forced to pay.

London River House
Royal Pier Road
Gravesend
Kent DA12 2BG
United Kingdom
Tel: +44 (0)1474 562200
Fax: +44 (0)1474 562281
Web: www.pla.co.uk

Freight Study Call for Evidence National Infrastructure Commission
5th Floor
Eastcheap Court
11 Philpot Lane
London EC3M 8UD

5 March 2018

Dear Sir/Madam

Freight Call for Evidence, Port of London Authority's consultation submission

The Port of London Authority (PLA) welcomes the National Infrastructure Commission's (NIC) study into the UK freight network.

This consultation response covers the business growth, infrastructure requirements and a view to the future for both: the main port operators on the Thames, who collectively make up the UK's second biggest port; and the growing inland waterways freight operations.

Our submission covers broad themes, rather than answering the detailed questions posed in the NIC's consultation document; we are happy to discuss and develop the themes subsequently.

PLA Overview

Our operations cover navigational safety on the tidal Thames, 95 miles of river which is home to the UK's second biggest port, supplying many millions of people in London and the greater south east with food, fuel and other of life's essentials.

All types of river use are currently growing and the Thames Vision, the 20-year development framework for the river, suggests this will continue over the medium- to long-term. The River Thames remains the busiest inland waterway in Great Britain, carrying over five million tonnes of goods and materials – keeping over a quarter million lorry trips off roads – and in excess of ten million passenger journeys a year.

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Our submission – deep sea terminal connectivity

About the port cluster:

- the Thames Vision (http://www.pla.co.uk/assets/thevisionforthetidalthames.pdf), the 20-year development framework for the river, forecasts port volumes growing over the next twenty years from 50 million tonnes today to 60-80 million tonnes (London was the UK's fastest growing port in 2016)
- this growth will be centred on the terminals in Dagenham, Purfleet, West Thurrock, Tilbury and London Gateway - which already handle over 80% of all cargo handled on the river
- significant private sector investment that will deliver the increased volumes is underway, including an application for a development consent order for a new port terminal, Tilbury2, by Forth Ports; DPW London Gateway's recently opened third berth attracting new services; and Cobelfret's expansion of its infrastructure in order to accommodate the deployment of the largest short sea roll-on/roll-off freight vessels in the world.

Road and rail connectivity requirements:

Confirmation of plans for the Lower Thames Crossing has provided valuable certainty for the long term development of infrastructure serving the port. Further major routes need attention though, not least to keep the transport system moving in the period of crossing construction. The three main terminals have connections to the strategic rail and road networks, with issues arising due to a lack of spare capacity and resilience in their respective road connections.

- the eastern section of the M25, the Dartford Crossings and the A13 are inadequate for the current volume of traffic, of which freight is a significant part
- the Thames Vision identifies improvements to the A13, alongside the new Lower Thames Crossing, as essential to deliver the forecast growth
- we have suggested in a separate submission to the Strategic Road Network consultation that the A13 would make an excellent and highly impactful demonstration project for their developing expressway concept
- a proactive approach to strategic road investment in south Essex and north Kent is essential for the functioning of the economy; the 300 'standstill incidents' at the Dartford Crossings every year impact on the nation's productivity and increase harmful emissions.

Our submission – local delivery via the Thames as a 'blue' highway

The following points cover the Thames as a 'blue highway', an integrated part of city centre logistics:

- harnessing the tide, over four million tonnes of cargo are moved between wharves on the Thames each year; this keeps more than 200,000 lorry trips off London's roads, reducing congestion and pollution
- the tidal Thames could facilitate the supply and removal of greater volumes of construction materials and deliveries of waste, alongside, food, beverages and consumer goods

…/3

- fifty wharves – or city centre discharge and loading points – on the Thames have been 'safeguarded' for cargo-handling use by the Secretary of State for Transport, following the advice of the Mayor of London and the PLA
- the Thames Vision identifies three wharves to be brought back into long-term use: Hurlingham Wharf in Hammersmith & Fulham (currently being used for the Tideway project), Orchard Wharf in Tower Hamlets and Peruvian Wharf in Newham
- the latter, Peruvian Wharf, was purchased by the PLA in late 2016 and in partnership with a long-term tenant, Bretts, will be reactivated during 2018 to service the construction of 30-45,000 homes per annum needed in Greater London.

Increasing use of lower carbon inland waterways transport for freight is likely to form part of developing models for the Port of the Future. Other trends include progressive decarbonisation of the supply chain (including cargoes) and increasing digitalisation. If this is an area the NIC would like to explore further, we will happily provide guidance on how best to do so.

Conclusion

With the right investment profile in public infrastructure – particularly hinterland connections to seaports – the freight sector can play its role in supporting future economic and population growth, with greater sustainability, reduced congestion and improved air quality.

Working with the terminal operators through the Port of London Infrastructure Group, we would be delighted to support the deliberations of the National Infrastructure Commission and are happy to host site visits as appropriate.

Do please contact us if you need any further information in relation to this submission.

Yours faithfully

[Signature redacted]

[Name redacted]
[Job title redacted]

National Infrastructure Commission Freight Study Call for Evidence

Submission from Rail Freight Group (RFG)

February 2018

1. RFG is pleased to submit evidence to the National Infrastructure Commission's Call for Evidence, as part of its inquiry into freight transport in the UK. RFG is the representative body for rail freight in the UK. We have around 120 member companies who are active in all areas of the rail freight sector including train operators, customers, supply chain and rolling stock companies, ports and terminal operators, developers and support services. Our aim is to increase the volume of goods moved by rail.

2. RFG strongly supports the concept of the NIC's freight study as an important way of raising the value of freight transport to the UK economy, and looking impartially at the future challenges and barriers.

General Comments

1. Freight distribution is critical to UK economic success, for business, importers and exporters, retailers and the general public. Yet there is little political recognition of this and the NIC study is therefore a vital piece of work in highlighting the sector and its infrastructure needs. Rail freight has a long term role to play as part of the UK's freight distribution network, but to enable it, along with other modes, to be successful, we need to encourage a new approach between Government and the private sector, which is able to focus on the positive benefits as well as externalities of freight transport, and ensure that the supporting policies and infrastructure are in place.

2. Rail freight is a key component of the overall freight market, representing around 10% of overall surface transport, around 17-18bn tonne-km per annum. In key markets and sectors, rail's market share is significantly higher, in particular construction materials and intermodal transport, as well as biomass and other bulks. Full details on rail freight statistics can be found on the ORR's website http://dataportal.orr.gov.uk/. Recent work by KPMG for Rail Delivery Group shows that for the calendar year 2016 rail freight delivered economic benefits totalling £1.7bn per year. This includes productivity gains for British businesses of around £1.17bn and congestion and environmental benefits of over £556m.

3. We recognise that rail freight will only ever be one component of freight distribution and must work effectively with other modes. Rail has key advantages for certain types of movement, including longer distance trunk haul, high volume distribution and access into urban centres for certain traffic types. Freight infrastructure must therefore best support multi modal transport, linking road, rail, ports and water freight, enabling each to play to their strengths.

What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?

What do you see as the key drivers to a successful freight system that is fit for the future?

4. Network Rail have produced forecasts of long term rail freight demand https://cdn.networkrail.co.uk/wp-content/uploads/2016/11/Freight-Market-Study.pdf and

are presently consulting on shorter term forecasts to 2024 which take better account of network constraints. DfT have also produced constrained forecasts as part of their rail freight strategy development https://www.gov.uk/government/publications/rail-freight-transport . These forecasts demonstrate that rail freight growth can be achieved where sufficient infrastructure is in place, and where the economic position between road and rail is sufficiently well balanced.

5. In particular, long term growth of rail freight will need;

- Investment in network capacity at key bottlenecks, and a balanced approach to passenger and freight on the network, which is likely to need Government support. This must include measures to increase the efficiency of rail freight operations on the network.
- Investment in ports, terminals and SRFIs which can be funded by the private sector with the right planning framework.
- An uplift in technological innovation which will need input from Government and private sector for larger scale projects such as digital signalling, but which can be driven by industry elsewhere.
- A coherent approach to alternative fuels and long term sustainable transport recognising that freight transport has particular needs but must also fit into an overall rail and road framework.
- Recognition of the different charging frameworks for passenger and freight and for road and rail and a move to a more modally common approach where possible.
- Advocacy and support from Government.

Which are the key freight corridors that matter the most? Where are the bottlenecks in the freight network, and what investments in upgrades could deliver the best value for money for freight efficiency and UK plc?

6. In 2009 DfT defined the policy of the Strategic Freight Network http://webarchive.nationalarchives.gov.uk/20110218174805/http://www.dft.gov.uk/pgr/rail/strategyfinance/strategy/freightnetwork/strategicfreightnetwork.pdf which aimed to provide a core network of routes fit for rail freight. Since then, Network Rail has worked to upgrade routes for freight, including for larger gauge and for longer trains. https://cdn.networkrail.co.uk/wp-content/uploads/2016/11/Strategic-freight-network-enhancement-schemes-2.pdf . Presently a number of schemes remain in delivery, including upgrades to the Felixstowe branch line to allow more trains to operate, longer trains from Southampton and from Buxton, work at Port of Liverpool and to Immingham and other schemes and studies.

7. Government has indicated that there will be some further funding available for freight in the next control period from April 2019. A long list of potential infrastructure schemes was summarised in Network Rail's Freight Network Study https://www.networkrail.co.uk/wp-content/uploads/2017/04/Freight-Network-Study-April-2017.pdf . The priority schemes are being developed but include further work on the Felixstowe to Nuneaton route, freight in North Transpennine upgrade, Channel Tunnel routes gauge capability and smaller projects to improve capacity and capability. https://cdn.networkrail.co.uk/wp-content/uploads/2018/02/Strategic-Business-Plan-2019-2024-Summary-FNPO.pdf

8. Scottish Government has also provided a Scottish rail freight network investment fund as described in its rail freight strategy https://www.transport.gov.scot/media/5362/ts-rail-freight-strategy-a4-aw3.pdf and has given strong support for rail freight growth in its

High Level Output specification for CP6 https://www.transport.gov.scot/media/39496/high-level-output-specification-hlos-for-control-period-6-final.pdf .

9. Rail freight can also benefit from the released capacity that will be generated by HS2 south of Birmingham and then Crewe. This is an important part of the case for HS2.

10. In addition to Government investment in the rail network, there has been significant private sector investment in terminals and rolling stock. Rail Delivery Group estimated this at around £2.25bn in 2014, and the investment has continued subsequently. For example, this year already we have seen a new rail linked site iPort open in Doncaster, planning permission given for a rail site at Cricklewood and a new to rail customer open a location on the Greenwich peninsula. https://www.raildeliverygroup.com/files/Publications/2015-02_freight_britain.pdf

To what extent are the economic benefits of freight factored into wider transport infrastructure investment planning?

11. In assessing the business case for a rail freight scheme, the main benefits included are the environmental benefits of using rail over road. These are principally defined in the Mode Shift Revenue Support grant calculations https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/389725/mode-shift-benefit-values-refresh.pdf which provide a 'pence per mile' benefit by road type. In some cases, estimates of productivity benefits are also included.

12. This means that investment decisions to support rail freight are made by comparing it to other freight modes. There is no attempt generally to look at the wider societal value of freight movement. In rail schemes there is no attempt to compare the value of freight moved to passenger traffic for example in the off peaks which could also inform operational and capacity allocation decisions on congested networks.

13. In assessing rail freight it is also important to look by market and by corridor, as values can be very different to the overall national picture. Research for DfT by Freight on Rail highlighted significant benefits from a greater use of rail freight on key corridors including the M6, A14 and A34 http://www.freightonrail.org.uk/HotTopicsInvesInRailFreightToReduceRoadCongestion.htm and http://www.bettertransport.org.uk/new-research-shows-just-2000-less-hgvs-would-mean-ten-cent-reduction-air-pollution

What are the regulatory and legal issues that, if changed, could improve freight efficiency without increasing costs or reducing efficiency?

14. There are many areas where the regulatory and legal frameworks for different modes of freight transport differ. In some cases these are inevitable, for example in railway timetabling, but in others they could be more aligned. This would aid simplicity for users, and prevent distortions between modes which prevent each playing to their strengths.

15. One such example is charges for rail access, which are calculated by ORR during the periodic review of Network Rail. http://orr.gov.uk/rail/economic-regulation/regulation-of-network-rail/price-controls/periodic-review-2018 . This includes a great deal of scrutiny of costs by mode, including by different rolling stock types, as well as additional charges for performance, use of electric traction and so on. This compares to road freight that

pays only fuel duty and VED set by HMT. Whilst there is some validity in both approaches, the difference makes it difficult to compare modes. The complexity of freight charging makes it hard for customers and operators to understand, and the five yearly process adds uncertainty which is unhelpful for a sector with long asset lives and investment cycles.

16. Rail freight also needs modern and fit for purpose terminals and to achieve this, we need a planning system that can deliver new facilities and safeguard existing ones. Larger Strategic Rail Freight Interchanges are covered by the Planning Act 2008 and the National Policy Statement for National Networks https://www.gov.uk/government/publications/national-policy-statement-for-national-networks and this has already helped to support the development of new sites at Kegworth and Daventry (Phase 3) with other sites in development.

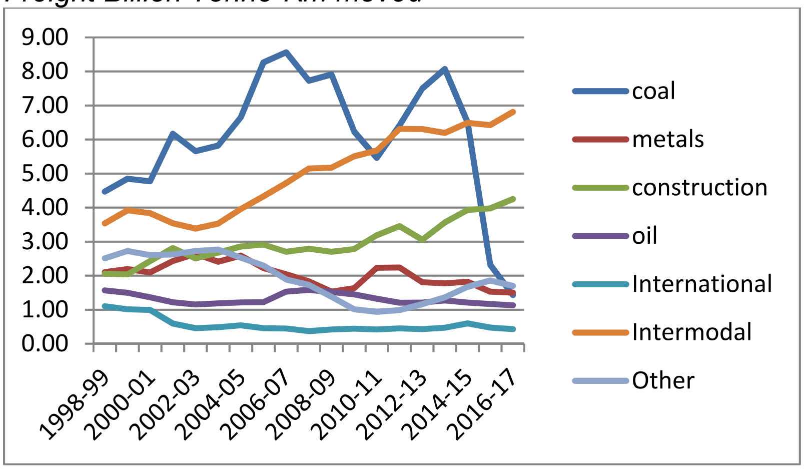
17. However, smaller locations can still struggle to achieve consent, particularly in the south east, and existing terminals are often affected by issues with inappropriate adjacent development. The Mayor of London's draft London Plan has made some good proposals for the safeguarding of rail sites and wharves, and more generally on provision of industrial land, and extending such approaches nationwide would be appropriate. https://www.london.gov.uk/what-we-do/planning/london-plan/new-london-plan/draft-new-london-plan/ .

How might the demand for freight develop and change over the next 20-30 years?

How has the demand for freight, and types of freight, changed over the last two decades, and what will be the drivers for changes in the future?

18. Rail freight has changed significantly over the last two decades as a consequence of privatisation. Over the same period there have been major changes in the markets moved by rail freight. The graph, from ORR data, shows the bn tonne-km moved in each commodity group. Most striking is the decline in coal over the last five years, which has arisen due to changes in generation policy away from coal to gas and renewables.

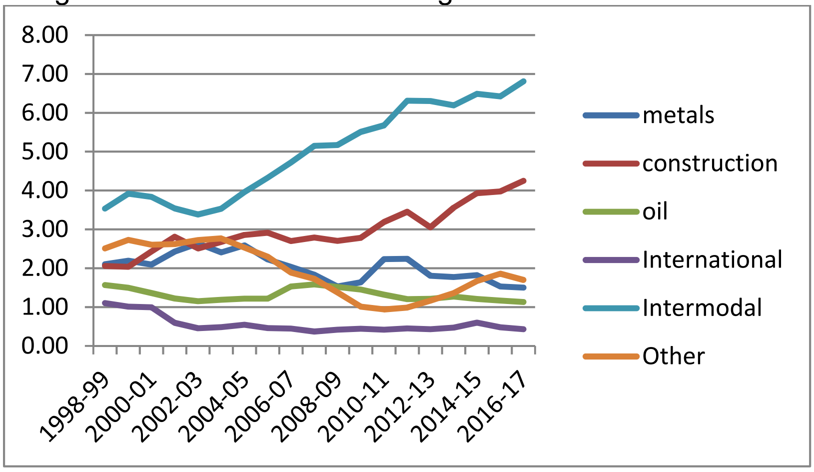
Freight Billion Tonne-Km moved



19. The decline in coal however masks the changes in other commodities. The revised graph shows more clearly the significant increase in intermodal rail freight over the last twenty years driven by economic changes towards greater imports, and an increase in

rail's market share driven by increased competition, and investment in ports, equipment and the network. Construction materials have also risen consistently, as businesses have increased their presence on rail, and larger quarries have replaced smaller non rail linked sites.

Freight Billion Tonne-km excluding coal



20. Presently we are expecting to see continued growth in these key market sectors, including domestic intermodal services between new rail linked warehouses, in line with the freight forecasts (as above). The key factors underlying these forecasts include;

- Growth in construction activity including infrastructure and housebuilding coupled with continued pressure to increase rail's market share particularly into urban centres.

- Investment in strategic rail freight interchanges which enable more efficient rail freight services to operate for domestic retail products between distribution centres.

- Continued growth in imports and exports and in rail's market share from major ports.

- Opportunities for growth in smaller markets such as automotive and steel

21. Looking to the future, there are a number of factors which could influence demand for freight, and rail freight. These include;

- Post Brexit changes in trade patterns, either as a consequence of new trading relationships or changes to distribution patterns through different ports. For example, a growth in freight at East Coast ports could increase demand for rail from these locations, and border controls for road on the Dover straits could help grow through rail freight via the Channel Tunnel.

- Global changes in manufacturing locations could similarly change supply chains and rail flows, for example, any reshoring or near shoring of manufacturing. Again, this could change distribution patterns in the UK.

- New approaches to industrial strategy which could generate new industrial locations capable of using rail, particularly if coupled with a proactive

Government rail strategy.

- Changes in how mineral products are used and supplied to the UK, and the demand for such products for major infrastructure construction. For example, any move to imports over domestic production, or changes in construction technique. However, given the long expected lives of present quarry sites, this is expected to be a long term shift rather than a short term one.

- Changes in consumer demand and online retail, although demand for the primary haul to warehouses is still likely to be necessary.

22. The CILT 2035 Freight and Logistics report considered some of these factors in more detail. https://ciltuk.org.uk/UK-Freight

How is the freight industry planning for future changes in the demand? What levers might be available to shape future demand for freight transport?

23. Network Rail's Freight Network Study (para 9) provides a network perspective of the infrastructure planning needed to support long term growth of freight and passenger. However there are a number of areas which are less well considered such as the release of capacity from HS2 and the impact of digital railway.

24. Whilst it is difficult for the rail freight industry to shape overall demand for freight transport, investment in rail linked warehousing and modern construction terminals is helping to reduce associated road movements, and enable 'value add' processes to take place alongside the railhead.

25. The rail industry has also been working to maximise the use of each train to reduce demand for capacity on the network. Rail Delivery Group analysis shows that the number of freight trains run fell by a third, from over 415,000 in 2002/03 to under 276,000 in 2012/13. Adjusting for tonnes carried, tonne miles have increased by 17% over the same period. This is a net increase of 70% in tonnes per train. Including changes in distances travelled, such that each freight train now carries over 50% more cargo than it did 10 years ago.'
https://www.raildeliverygroup.com/files/Publications/archive/2014-05_keeping_the_lights_on.pdf

26. This trend has continued since that publication, with intermodal trains working towards 640m length, and construction trains working to extend their loaded volumes including in some cases use of 2 locomotives. New wagons also have increased payload over those they replace. Network Rail investment is supporting this in key locations.

What effects does congestion have on the efficiency of freight movement and emissions?

27. Operating on a crowded rail network impacts on the efficiency of rail freight and on asset utilisation and fuel use. Analysis by Tarmac shows that the average speeds attained by their trains is consistently below 30mph, and as low as 7mph on some routes.

28. Overall it is estimated that the average attained speed for rail freight is around 25mph, owing to poor paths and congestion on the network. (terminal time is excluded).

29. Work for the Department for Transport by Transport Systems Catapult (slides already supplied to NIC) assessed the impact on rail freight of such ‘dwell time’ (essentially unproductive time during a journey) and concluded that,;

Dwell Impact on Industry Costs
•impact of delay estimated to be £3.30 / minute

•Industry cost of timetabled dwell time £27.1m per annum

Dwell impact on freight users
•Impact of journey time savings valued at £0.35 /minute

•Elimination of dwell time would lead to estimated £2.8m per annum in benefits to freight users

Dwell impact on demand for rail freight
•Achieving journey time reduction of 15% (elimination of dwell) estimated to lead to increase in demand, and hence industry revenues, of 20%

30. Network Rail’s plans for CP6 include some targets to help improve freight velocity, and digitisation of the rail network is also expected to help drive efficiency. Network Rail’s System Operator function also has an important role to play in developing these areas.

How does congestion impact upon the productivity and economic contribution of freight? To what extent does congestion affect changes to mode, time or other freight choices?

31. Rail freight tends to avoid the passenger peaks, and a significant proportion operates at night, but there are limitations around engineering work, and planning conditions at some terminals which mean that they cannot open out of hours to receive a train.

How does congestion affect the environmental impacts of the movement of freight?

32. Poor journey times means that for diesel freight trains more fuel will be needed for each journey. Train operators are fitting some locomotives with start – stop technology which can switch off the engine when stationary for more than 15 minutes, and this is used now when in terminals or yards.

With limited space for new infrastructure, how can we better use our existing urban network to support freight? Are there changes – such as changes to modes, methods, or delivery times - that could help reduce the stress on the urban transport network?

33. Although rail freight cannot replace road freight for urban deliveries there are areas where it can facilitate more efficient deliveries. Presently, use of rail to serve construction terminals in urban centres reduces the long distance movements for supply of materials, significantly reducing road movements http://dev.rfg.org.uk/wp-content/uploads/2017/11/Wharf-and-Rail-Depot-Safeguarding-document.-November-2017.pdf

34. There have also been trials of moving roll caged freight into passenger stations for onward distribution to store by electric vehicle, and small parcels and packages are now carried on some passenger trains http://intercityrailfreight.com/ . There is ambition to exploit this model for other routes and services and to look at rolling stock options to

enable freight to be delivered into urban centres, for example using older passenger trains which are no longer required.

35. Industrial property development could also offer opportunities for modern rail hubs in urban centres https://www.addleshawgoddard.com/en/insights/insights-briefings/2016/general/report-how-soon-is-now-the-disruption-and-evolution-of-logistics-and-industrial-property/ .

How can freight lower its carbon and air quality impacts?

Are there efficiencies within freight management and distribution practices that could help reduce the CO2 and NOx emissions from freight?

36. Rail freight is acknowledged as having a superior environmental performance to road freight producing 76% less CO_2 per tonne moved. Rail also produces less NOx and particulates than road freight. It is acknowledged that rail freight needs to work to further reduce its emissions particularly in respect of air quality and in light of the recent challenge from the Rail Minister. Nonetheless a greater use of rail will help to reduce overall transport emissions. Our policy paper on air quality is here http://www.rfg.org.uk/wp-content/uploads/2017/12/Air-quality-freight-FINAL-2.pdf

What role do alternative fuels such as electricity, Liquid Petroleum Gas and biofuels have to play? What are the barriers and challenges to wide-scale uptake of alternatives to diesel and what could be done to help remove these issues?

37. Although there is a significant body of research for road freight, including that funded by Office for Low Emission Vehicles, there has been no equivalent research for rail. Globally, most rail freight remains either diesel or overhead electric. Some rail operators are looking at alternative options and may be able to provide information confidentially, but we understand there are significant challenges in achieving the necessary power output.

What technologies could best and most realistically be utilised to manage the carbon impacts of freight, both within urban areas and on longer strategic journeys?

38. Use of overhead electrification is an obvious solution for freight where there are enough electrified lines to justify investment in electric locomotives and bimodes. There are some significant gaps in the overhead network for freight at present, and this is an area where we will continue to make the case for further development.

39. Operators are looking at potential to modify existing locomotives to improve their emissions in the shorter term, as well as measures like start stop which can reduce fuel use. There has been some recent investment in new bi-mode locomotives by one operator.

How could new technologies be utilised to increase the efficiency and productivity of UK freight?

How will new technologies change the capacity and performance of the freight transport network? Over what timeframes might these new technologies begin to affect the freight transport network?

40. The railway is planning and implementing widespread digitisation particularly of the signalling system. Such developments will increase network reliability and capacity and can also help to simplify the processes for connecting new facilities to the network and making upgrades to infrastructure. The Digital railway plans for the next control period are here https://cdn.networkrail.co.uk/wp-content/uploads/2018/02/Digital-Railway-Programme-Strategic-Plan.pdf

41. To support the fitment of necessary equipment for freight, Network Rail have just established a contract to develop ‘first in class’ fitment, and then wider roll out of digital signalling for freight. https://www.networkrail.co.uk/feeds/freight-trains-in-britain-to-be-upgraded-with-delay-busting-digital-technology-in-multi-million-pound-deal/

42. At a smaller scale, there are also opportunities for a greater use of technology by freight operators and customers, for example in wagons, in systems and in information which can deliver efficiencies and growth.

How can the use of data such as real-time traffic information by artificial intelligence and machine learning systems help to improve freight efficiency and productivity? How might this affect the business models and requirements of freight in the future? Are there any barriers to the greater use of data in freight?

43. Railway systems are data intensive and as outlined above, greater digitisation of signalling and railway systems will deliver increased efficiency. These are likely to be distinct from systems in other modes, and so a potential barrier will be in any systems which are pan modal and require co-ordination between railway and other infrastructure.

How do you see technologies such as HGV platooning, digital railway signalling, and autonomous vehicles being integrated into freight distribution?

44. We recognise that technologies such as platooning and autonomous vehicles will impact on freight distribution, but their impacts need to be assessed holistically, not just with reference to the specific technology (for example, in relation to infrastructure charging, comparable changes in passenger transport etc.). Although platooning may have potential benefits in some areas, the UK road network does not appear to be designed for this type of traffic presently, and the potential impacts on motorway operation and junction designs should be considered.

How might regulations and physical infrastructure need to adapt to new technologies and business models in the freight sector?

45. As outlined above, digital signalling will require fitment to freight locomotives as well as physical work on the track and railway infrastructure. There will also be changes to railway systems such as the performance regime and other regulatory mechanisms.

Are there good examples internationally of freight systems, policy, infrastructure or technology development and implementation that the UK can learn from to increase freight efficiency and/or reduce the carbon and congestion impacts?

46. Rail freight operations in other countries often operate on very different models to the UK and so direct comparisons are more difficult. However there are some examples which may have some relevance to the UK market.

47. The Betuwe route in The Netherlands represents a major investment to provide effective rail transport from the Port of Rotterdam https://www.railway-technology.com/projects/betuweroute/ .

48. The German Government has intervened to reduce track charges for rail freight to promote competition with road freight. https://www.globalrailnews.com/2017/06/26/germany-to-slash-track-access-charges-for-rail-freight-operators/

49. There are examples of using LNG as an alternative fuel for rail freight, although in many cases this is co-fired with diesel. http://www.railjournal.com/index.php/north-america/florida-east-coast-railway-converts-locomotive-fleet-to-lng.html (and other press articles from elsewhere)

TimberTransportForum
delivering solutions for a growing UK harvest

Freight Study Call for Evidence
National Infrastructure Commission

Freightstudy@nic.gsi.gov.uk

Timber Transport Forum Response to UK NIC Freight Study Call for Evidence

Please find below some background to the structure, context and work of the Timber Transport Forum, followed by responses to some of the questions set out in the call for evidence.

The Timber Transport Forum would be happy to provide further information as required.

The Timber Transport Forum

The Timber Transport Forum[i] is a voluntary partnership organisation set up in 2000 to address the issues raised by timber transport in Great Britain. The Forum includes representatives of the forestry and timber industries, the local roads authorities and various national agencies and organisations, including Forestry Commission England, Forestry Commission Scotland and Transport Scotland (freight).

Forestry and Timber Transport

The UK forest area has expanded substantially since the 1950s with much of the expansion in Scotland the north of England and Wales. The area of woodland in the UK at 31 March 2017 is estimated to be 3.17 million hectares. This represents 13% of the total land area in the UK, 10% in England, 15% in Wales, 18% in Scotland and 8% in Northern Ireland. Seven thousand hectares of new woodland were created in the UK in 2016-17.

In some local authorities, such as Dumfries & Galloway and Argyll, forest cover is around 30%.

The rate of growth of the forest industry is significant, for example, timber production from Scotland's forests has grown from 1m tonnes /yr in 1976 to over 7.5m tonnes/yr today. It is forecast to increase to 10m tonnes/yr by 2030.

11.0 million green tonnes of UK roundwood (softwood and hardwood) were delivered to primary wood processors and others in 2016, representing a 2% increase from the previous year.

A substantial processing industry has grown around this resource which feeds around 50? large processors including sawmills, board mills, pulp mills, and various biomass fuel processors throughout rural UK and many smaller processors.

In Scotland alone , a recent economic evaluation[ii] gave an industry value of £1bn GVA and employment of 25,000 jobs.

The Forum's own analysis funded by the Roads Maintenance Research Board estimates that timber comes onto the public road network from Scottish forests at around 3000 places, mostly in upland, rural Scotland and often onto the minor road network of council-managed, B, C and Unclassified roads. Many of these roads have minimum structure, drainage and geometry dating from the early 20th century.

A similar situation is found in the uplands of the north of England and Wales. Moving several millions of tonnes of timber each year on standard 44 tonne lorries (27 tonne load) across this minor road network can have impacts on the fabric, structure and drainage of the roads, and on neighbours, communities and other road users.

To keep this impact to a minimum the Forum promotes the following voluntary measures:

- Agreed Routes Map[iii]. The Agreed Routes Map covers Scotland and north England and includes over 10,000km of B, C and U class roads. It sets out the hierarchy of roads for use timber traffic. The categories are:

    - Agreed Routes: Used for timber haulage without restriction as regulated by the Road Traffic Act 1988. A-roads are classified as Agreed Routes by default unless covered by one of the other TTG classifications below.

    - Consultation Routes: Recognised as key to timber extraction but which are not up to Agreed Route standard. Consultation with Local Authority is required and it may be necessary to agree limits of timing, allowable tonnage etc. before the route can be used. B-roads and minor roads are classified as Consultation Routes by default unless covered by one of the other TTG classifications below.

    - Severely Restricted Routes: Not normally to be used for timber transport in their present condition. These routes are close to being Excluded Routes. Consultation with the Local Authority is required to achieve an agreed management regime to avoid land-locking of timber.

    - Excluded Routes: Should not be used for timber transport in their present condition. These routes are either formally restricted, or are close to being formally restricted, to protect the network from damaging loads. Consultation with the Local Authority is required to explore alternatives.

The majority are categorised as 'consultation routes' and this prompts those involved in the harvesting and transport of timber to consult the local roads/highways authority (councils) to discuss the transport and agree appropriate voluntary management of the road and/or the traffic to minimise impacts on the road and disruption to other road users thereby sustaining the road network.

- Timber Transport Groups[iv]. There are 10 timber transport groups covering 10 rural councils. The groups are a parallel local partnership of industry and roads authority representatives meet 2-3 times a year to establish good communications, discuss timber transport issues, highlight any concerns that have been raised and propose any changes to agreed routes maps or suggest traffic management measures that may be appropriate. Most of the groups, and the GB Forum, are supported by part time project officers.
- Good Practice[v]. The Forum produces good practice guidance covering safe loading, load security, agreed routes, consultation with local roads authorities and other stakeholders and managing timber operations close to public roads. We have also produced technical guidance on lower impact lorry technologies which can help to reduce the impact of heavy lorries on the road structure. Some of the groups produce their own local good practice guidance and protocols[vi].

Within the context of these voluntary measures and subject to the voluntary implementation of the Agreed Routes Map process, the forest and timber industries presume the right to use the unrestricted public road network for timber transport. There is no such voluntary arrangement in place for other rural industries using the minor road network (whisky, agriculture, fishing, fish farming, quarrying, construction, wholesale etc.). Similarly, the voluntary partnership does not limit the council's statutory powers, as roads/highways authority, to restrict traffic on the public road to protect the road network where necessary.

This voluntary partnership is effective and has enabled the expansion of the timber industry over the last two decades adding value to our forest resource and helping this 'carbon positive' industry become a major driver in rural development and employment.

The voluntary partnership has also sustained the local roads networks without investing the huge resources needed to fully upgrade the infrastructure to suit modern haulage vehicles.

However, this approach obviously impacts on the efficiency of the supply chain and the tonnage that can be hauled daily.

Rural Road Infrastructure
The Forum recognises that the development of the rural road network has not kept pace with changing forest cover, despite its long-term nature. The Forum regularly presents information to councils and national governments on medium to long term timber transport requirements. We proposed, and support the continuation of, the Scottish Government's Strategic Timber Transport Fund[vii] and the associated scheme which provides national co-finance to public road improvements and other projects to reduce the impact of timber traffic. This fund has been running for 12 years and has contributed over £26 million to projects worth over £50m.

The Forum supported and welcomed Northumberland County Council's successful bid for rural challenge funding for rural road improvements in 2017.

We recognise that there remains a significant gap between the demands of our land use and the infrastructure that serves it.

For example, Audit Scotland's report on road maintenance last year showed that the condition of local roads in rural Scotland is poor; on average around 60% are in good condition and in some areas this figure is much less. Even those in good condition may not be suitable for haulage from large scale timber operations. There are not the resources to maintain local road infrastructure at a reasonable level for timber transport, let alone invest in much -needed modernisation for 21st century land uses and businesses.

The Forum encourages local and national government to take account of the infrastructure requirements of modern rural land use and is working with other rural sectors to make the case for a step change in rural transport infrastructure investment to ensure economic opportunities for people throughout rural UK.

In the meantime the forest and timber industries (unlike any other rural industry) continue to take voluntary measures to manage timber transport.

However there is a limit to what such measures can achieve especially with rising volumes of timber freight and deteriorating minor roads. Limited freight capacity of rural roads is already taking a toll on the efficiency of the supply chain.

Sea and rail transport of timber

Transport by sea as a way of taking timber traffic off rural roads has been a major development in recent years. The Timberlink service[viii] is a public service contract operating under an EU derogation for peninsulas that supports the shipping of timber from forests in Argyll to timber processors in Ayrshire. The support from the Strategic Timber Transport Fund pays the additional cost of haulage by sea rather than by road. However, the first leg of haulage from the forest to the harbour is by road.

The fund has also supported the use of floating piers and the development of a landing craft to transport timber from islands and from coastal forests distant from trunk roads or processors. In a handful of cases this obviates the need for local road haulage.

Rail haulage is used to serve one major wood processor in north Wales bringing timber directly into the yard from various sites across England and Wales. In most cases however the scope for a shift from road to rail is limited by the limited access to the peripheral rail network and the relatively large catchments of forest. There are a few places from which rail haulage could help shift concetrations of timber from fragile roads but again the cost of creating efficient new access and established freight paths on single tracked stretches of the network means these are proving challenging to establish.

Where there is a road haulage option this is usually significantly cheaper. The state aid approved mechanisms to support a mode shift to sea or rail transport would appear not to be suited to the scale and nature of forestry operation as uptake of these grants has been limited. The Forum is currently reviewing this subject and will offer suggestions for a review of coastal shipping support mechanisms in due course. Barriers to modal shift are various and were highlighted in the Forum's response to the Scottish Parliament's Infrastructure and Capital Investment Committee Inquiry into freight transport in Scotland[ix].

Critically, however, modal shift will rarely diminish the need for initial road haulage from the forest and in non coastal parts of the country coastal shipping would not offer a viable or sensible alternative to road haulage operations.

Responses to the Questions

1. What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?

For the home grown timber industry perspective, the main constraint is the very limited freight capacity of both rural trunk roads and the local rural road network which provides access to most rural land uses and land-based businesses. The forest resource is generally in the rural uplands on the periphery of all infrastructure networks. The processors are located within these catchments. Neither can relocate to better infrastructure provisioned sites. Many of the minor roads serving forests are singletrack with passing places with very limited capacity for modern 44 tonne trucks. Even the local A roads are rarely up to modern standards for single carriageway roads and rural trunk routes to markets remain mostly long distances on aged, poor standard, single carriageway roads.

1.1. What do you see as the key drivers to a successful freight system that is fit for the future?

Modern well-engineered local roads. Most freight km are on local roads not trunk roads and these need modernisation if we are going to have any impact on overall freight efficiency.

1.2. Which are the key freight corridors that matter the most? Where are the bottlenecks in the freight network, and what investments in upgrades could deliver the best value for money for freight efficiency and UK plc?

For rural land uses and industries it is not main corridors or bottlenecks that are the issue it is the limited strength, geometry and freight capacity of the minor road network and peripheral rural trunk roads.

1.3. To what extent are the economic benefits of freight factored into wider transport infrastructure investment planning?

Rarely in rural areas. Current investment appraisal models simply will never support rural road investment on any scale. Unless there is a deliberate policy agenda it will not happen.

1.4. What are the regulatory and legal issues that, if changed, could improve freight efficiency without increasing costs or reducing efficiency?

Better integration of rural land use policies into strategic freight planning. Given the length and condition of rural road networks it will be very difficult for significant modernisation to take place without national funding.

2. How might the demand for freight develop and change over the next 20-30 years?

2.1. How has the demand for freight, and types of freight, changed over the last two decades, and what will be the drivers for changes in the future?

The timber freight tonnage has doubled in the last 20 years and will continue to grow by 50% again over the coming decade. We can only shift 11mt/yr using modern HGvs and this requires a modernaisation of the local minor roads serving forested areas as well as improving capacity of the rural trunk roads. While moves towards electric and more autonomous freight vehicles may increase core route efficiencies it may leave the rural areas, relatively speaking, even less competitive driving further disparities between urban central economies and the rural periphery.

2.2. How is the freight industry planning for future changes in the demand? What levers might be available to shape future demand for freight transport?

3. What effects does congestion have on the efficiency of freight movement and emissions?

It is not just motorway and major road congestion that limits efficiency. Single carriageway rural trunk roads quickly become over capacity in terms of overtaking etc. leaving rural traffic with ever longer journey times. Rural road fuel efficiency is already much less than dual carriageway and motorway figures.

3.1. How does congestion impact upon the productivity and economic contribution of freight? To what extent does congestion affect changes to mode, time or other freight choices?

Rural freight haulage rarely has mode options as access to ports and railheads is also constrained by limited and aged infrastructure. Ferry freight capacity is limited and can create bottlenecks.

3.2. How does congestion affect the environmental impacts of the movement of freight?

3.3. With limited space for new infrastructure, how can we better use our existing urban network to support freight? Are there changes – such as changes to modes, methods, or delivery times - that could help reduce the stress on the urban transport network?

Remember rural haulage – most haulage is rural!

3. How can freight lower its carbon and air quality impacts?

4.1. Are there efficiencies within freight management and distribution practices that could help reduce the CO2 and NOx emissions from freight?

Not always with rural freight where there is less opportunity for back loads and improved logistics. Improved road infrastructure will reduce emissions.

The home grown forest and timber resource is the only carbon sink in our carbon budgets and the timber industry has the benefit of being effectively carbon positive and providing material for sustainable low carbon housing. However it does require the modernisation of rural transport infrastructure.

4.2. What role do alternative fuels such as electricity, Liquid Petroleum Gas and biofuels have to play? What are the barriers and challenges to wide-scale uptake of alternatives to diesel and what could be done to help remove these issues?

Major investment and countrywide distribution of new power technologies. There is little point making the core roads electric if the local roads are not also supported.

4.3. What technologies could best and most realistically be utilised to manage the carbon impacts of freight, both within urban areas and on longer strategic journeys?

5. How could new technologies be utilised to increase the efficiency and productivity of UK freight?

5.1. How will new technologies change the capacity and performance of the freight transport network? Over what timeframes might these new technologies begin to affect the freight transport network?

Our concern is that unless these new technologies are distributed across the whole country they will increase disparity between a more efficient central distributiin network and a relatively even more disadvantaged rural periphery.

5.2. How can the use of data such as real-time traffic information by artificial intelligence and machine learning systems help to improve freight efficiency and productivity? How might this affect the business models and requirements of freight in the future? Are there any barriers to the greater use of data in freight?

Even mobile phone coverage is limited across much of rural GB let alone data coverage and the modern 4G or even 5G networks required..

5.3. How do you see technologies such as HGV platooning, digital railway signalling, and autonomous vehicles being integrated into freight distribution?

5.4. How might regulations and physical infrastructure need to adapt to new technologies and business models in the freight sector?

Land based industries cannot move to the centre. We need improved physical freight infrastructure across the length and breadth of the UK.

6. Are there good examples internationally of freight systems, policy, infrastructure or technology development and implementation that the UK can learn from to increase freight efficiency and/or reduce the carbon and congestion impacts?

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[i] http://timbertransportforum.org.uk/

[ii] http://timbertransportforum.org.uk/attachments/article/123/economic-contribution-forestry-2015.pdf

[iii] https://timbertf.maps.arcgis.com/apps/webappviewer/index.html?id=cd6737077f1044728a121c8e311d781f

[iv] http://timbertransportforum.org.uk/groups

[v] http://timbertransportforum.org.uk/work/good-practice

[vi] http://timbertransportforum.org.uk/attachments/article/87/STTTG%20Timber%20Transport%20Protocol%202013.pdf

[vii] http://scotland.forestry.gov.uk/supporting/forest-industries/timber-transport/strategic-timber-transport-fund

[viii] http://timbertransportforum.org.uk/attachments/article/118/FCS%20Publication%202014%20Case%20Study%20Timberlink.pdf

[ix] http://timbertransportforum.org.uk/attachments/article/123/Scottish%20Parliament%20Enquiry%20Freight%20Infrastructure%202015.pdf

Sir John Armitt
National Infrastructure Commission
11 Philpot Lane
London
EC3M 8UD

Kent County Council
Invicta House
Maidstone
ME14 1XX

Ask for: [Name redacted]
Email: [Email address redacted]

5 March 2018

Dear Sir John,

Evidence on the Future of the UK's Freight Industry

In response to the National Infrastructure Commission's call for evidence on the future of the UK's freight industry, Kent County Council (KCC) would like to take the opportunity to respond to this call and assist the Commission in this important work.

As I am sure you are aware, freight plays a major role in the Kent economy and therefore KCC would like to bring its experience and knowledge from a county which accommodates high volumes of freight vehicles. On average 11,500 HGVs cross the Strait of Dover each day and almost 1,000 lorries a night are parked in lay-bys, on verges and in other inappropriate locations across the county.

Freight issues in Kent are of both local and national importance. For example, Operation Stack, which caused unprecedented disruption in the summer of 2015 when it was in use for 32 days, was estimated to cost the Kent economy around £1.45 million per day as it impacted residents and businesses. Its effects were much wider though, as the UK economy is dependent on freight fluidity through the Channel ports, and the wider impact was estimated at £250 million per day.

It is therefore clear that where the road network inhibits the ability of business to import and export then the UK's competitiveness is also inhibited. Delays and lack of infrastructure in Kent to feed to Channel ports affect growth in the 'Midlands Engine' and 'Northern Powerhouse'.

KCC's response to the Commission's questions are attached to this letter and I would be happy to expand on any aspect, either as further written evidence, or by meeting with the Commission to help with its study on the future of freight.

Yours sincerely,

[Signature redacted]

[Name redacted]
[Job title redacted]
Kent County Council

1. What are the key constraints to the effective and efficient movement of freight in the UK and how do we overcome them?

1.1 What do you see as the key drivers to a successful freight system that is fit for the future?

Kent County Council (KCC) envisages a successful freight system as one that connects key trading partners, does so reliably and safely, has well-maintained infrastructure and supports the UK economy. Each of these areas is addressed below in terms of how the freight network in Kent is affected and could be improved. Furthermore, the ports themselves should be supported to ensure that they can grow and contribute to our economy, as well as providing resilience for other ports. In Kent, the Port of Ramsgate has great potential to grow and complement the Port of Dover for cross-Channel routes. Similarly, the Port of Sheerness has deep-water access and plans for growth in their logistics facilities for handling automotive, steel and forest products. Growth at the ports supports the economy and supports jobs.

Connectivity, resilience and freight fluidity:

An alternative solution to Operation Stack is desperately needed to keep the M20 open to local residents and businesses at all times. Kent's local road network must not take the burden from delays of cross-Channel freight traffic. It is for this reason that KCC is very disappointed that the Government is no longer constructing a permanent lorry holding area at Stanford West. Whilst it is appreciated that work will continue on new proposals for accommodating freight in the event of cross-Channel delays, a planning application will not be considered until 2019. Whilst this would be of serious concern in its own right, the timing of this process, as it is so close to Brexit, makes the delays in identifying a solution all the more alarming. With rising concerns about the likelihood of more and more frequent delays in cross-Channel traffic and freight movements post-Brexit, there is an urgent need for the Government to move forward with an alternative to Operation Stack.

As such, with the uncertainty over Brexit and its effect on the ports, KCC urges that something needs to be done sooner to ensure that a solution is in place before the UK leaves the EU on 29 March 2019. For years KCC has argued that an alternative solution to Operation Stack, which blights not only Kent's residents and businesses but costs the whole economy of the UK, is needed. Operation Stack has an estimated cost to the Kent and Medway economy of around £1.45 million a day and across the country it was estimated to be about £250 million a day. There cannot be a repeat of the disruption experienced in the summer of 2015 when Operation Stack was in place for 32 days and caused travel chaos that negatively affected businesses across the whole of the UK. A solution to this problem should be an urgent priority for Government.

Appropriate Infrastructure and safety:

A further impact of the high freight traffic volumes travelling through Kent is the provision for overnight lorry parking. As a result of EU driver's hours regulation, HGV drivers are required to take both daily driving breaks and overnight rests. There is a severe shortfall of official lorry parking spaces in the county which leads to inappropriate and in some cases dangerous parking. The negative impacts of this parking are lorry related crime/thefts, road safety, damage to roads, kerbs and verges, environmental health issues (including human waste), litter and noise disturbances, especially when close to residential areas. KCC has conducted repeat surveys into the volumes of inappropriately parked HGVs in the county and found that on average there were nearly 1,000 vehicles parked inappropriately per night. KCC therefore wants to work with Highways England (HE), the Department for Transport (DfT) and other relevant stakeholders to investigate the potential for constructing a network of lorry parks across Kent to alleviate this problem and provide safe and secure facilities for drivers. Additional lorry parking should also be added to motorway service areas, especially considering HE's objective to improve roadside facilities as proposed in their recent *Initial Report*. The better utilisation of motorway service areas is a clear opportunity to quickly provide some relief to the problem of overnight lorry parking until additional dedicated facilities can be provided.

Further, KCC would also like to emphasise the importance of incorporating overnight parking into the new plans for an Operation Stack lorry area to provide much needed lorry parking capacity in Kent. However, in the first instance new lorry parking should be provided by the private sector because there is a clear demand for such facilities from drivers and, so it presents a commercial opportunity.

Maintenance:

Given the importance of the strategic motorway corridors running through Kent (the M2/A2 and M20/A20) as well as the local road network which supports them, roads in Kent carry disproportionately high volumes of freight traffic and consequently require greater maintenance than roads in other areas. The cost of maintaining these roads are substantial and add to the increasing pressure on KCC and HE budgets. KCC is increasingly dependent on discrete funds, such as the Challenge Fund, to maintain the local road network whereas a reliable road network needs sustained and higher maintenance funding.

1.2 Which are the key freight corridors that matter the most? Where are the bottlenecks in the freight network, and what investments in upgrades could deliver the best value for money for freight efficiency and UK plc?

Road Improvements in Kent:

In Kent there are a number of bottlenecks on both the Strategic Road Network and local road network that inhibit growth in the road freight industry. The following schemes are needed to ease congestion and improve the road network for access to Kent's largest ports at Dover, Eurotunnel and the Port of Sheerness. These schemes would improve the resilience and capacity of the SRN to the Channel Ports and support the bifurcation (splitting) of port-bound traffic between both strategic motorway corridors (M20/A20 and M2/A2).

- New Lower Thames Crossing to create a new strategic corridor from the Midlands to the Port of Dover, bringing resilience to the A282 Dartford Crossing.
- An upgrade of M2 Junction 7 (Brenley Corner) to provide free-flow from the M2 to the A2.
- Completion of the A2 dualling between Lydden and Dover.
- Widening/all lane running along the M2 between junctions 4 and 7 to increase capacity of this two-lane motorway.
- Improved connections between the M2/A2 and the M20/A20, including an upgrade of the A229 Bluebell Hill and its junctions with the M2 (Junction 3) and the M20 (Junction 6) – the initially proposed new Lower Thames Crossing Option C 'variant'; and the A249 and its junctions with the M2 (Junction 5) and the M20 (Junction 7).
- A2 Dover Traffic Assessment Project (TAP) to complement the existing A20 TAP and reduce congestion through Dover town when there are delays at the port.

Undoubtedly, where the road network inhibits the ability of businesses to import and export, the UK's competitiveness is also inhibited. The Port of Dover has annual forecasts of growth of between 2% and 4%, and the Channel Tunnel up to 30% over the next five years. Delays and a lack of infrastructure capacity not only impact on the efficiency of the Channel Ports but also the economy in the Midlands ('Midlands Engine') and North ('Northern Powerhouse') which are dependent on imports and exports to and from mainland Europe through the Strait of Dover.

Rail Freight Improvements:

A major limitation of rail freight in Kent is capacity on existing lines, especially for rail freight operators to obtain train paths through London. KCC fully supports modal shift from road to rail freight to reduce HGV movements in the county, so long as it does not adversely affect peak rail passenger services. Rail freight is more environmentally friendly than road freight using 76% less carbon dioxide than the equivalent road freight movements.

The annual volume of rail freight through Kent is around one million tonnes; however, there is spare capacity on the three Mainline rail routes through Kent (one via Maidstone, one via Tonbridge and Redhill, and one via Tonbridge and Sevenoaks). While there are gauge constraints on these routes, there are paths on each that were guaranteed for freight as part of the initial agreement for the construction of the Channel Tunnel. HS1 has European gauge standards and, while capacity for slow-moving freight trains on that line is limited to the night hours, with careful planning and accurate timekeeping a reasonable amount of traffic could use this route. One problem is that terminal capacity at Dagenham, where freight trains leave HS1, is limited. Indeed, a key restraining factor is the lack of terminals.

Operation Stack:

Along with the need to cater for greater volumes of HGV movements, there is a need to accommodate those increased volumes when there are delays at the Channel Ports. Currently, the response to such delay is Operation Stack – an unsustainable approach that effectively turns the primary motorway route between the UK and Europe into a lorry park. As such, an alternative solution to Operation Stack is also a key strategic priority for Kent as set out in KCC's *Local Transport Plan 4: Delivering Growth with Gridlock (2016-2031)* and the *Freight Action Plan for Kent*.

KCC supported HE's previous plan for a permanent lorry area with provision to hold up to 3,600 HGVs but notes no reference is made to a future solution to the issue within their recent *Initial Report*. The impacts of Operation Stack are felt across the whole county as Kent's residents and businesses struggle to get to work, school, medical appointments and carry out everyday tasks. As already stated, the cost of Operation Stack to the Kent and Medway economy is severe; Operation Stack also impacts on the Local Road Network in terms of damage to the road surface and accelerated asset deterioration. Therefore, it is imperative a solution to Operation Stack is delivered to provide a reliable SRN which meets the needs of businesses both within Kent and the wider UK, as well as internationally.

Overnight Lorry Parking:

A lorry park fund is required to help local authorities (and the private sector) to build lorry parks that provide adequate facilities for drivers. KCC has undertaken parking surveys in Kent which have found almost 1,000 HGVs parked on both the SRN and the Local Road Network (LRN) each night. Due to this parking, residents are subjected to noise, anti-social behaviour, littering, road safety issues, and damaged kerbs and verges.

Additional lorry parking capacity is desperately needed in certain areas of the UK (especially in Kent) and is not currently being delivered to the required level by the private sector. The main obstacles to private sector delivery of lorry parks are the availability of funding or finance for the capital investment, and the planning process. Costs are often substantial and require a longer-term view of investment than a typical five to ten-year return that private investors would require. Funding for lorry parks through HE's proposed roadside facilities fund (as set out in their *Initial Report*) could help to remove this barrier to the delivery of much needed provision. KCC is currently developing business cases for potential sites in the county and a designated fund could help to finance these proposals. Given that the capital investment is a prohibitive factor, KCC would expect the fund to provide a capital contribution as well as facilitate involvement from HE in their access arrangements and signing from the SRN.

1.3 To what extent are the economic benefits of freight factored into wider transport infrastructure investment planning?

The road freight industry is worth £74bn to the UK economy per annum and the Channel Ports play a vital role in this prosperity. In 2016 over 4.2 million HGVs passed through the Channel Ports – 2.6 million through the Port of Dover and 1.6 million through the Channel Tunnel, which together equates to on average 11,500 HGVs crossing the Strait of Dover each day (5,750 in each direction). 70% of this HGV traffic from the Channel Ports uses the Dartford Crossing to travel to the Midlands and the north. The Channel Ports also handle 23 million passengers per year, which puts them on a comparable basis with London Stansted Airport (24 million passengers in 2016). Improvements are desperately needed to accommodate the DfT's growth estimates of 22% in freight volumes between 2010 and 2040 across the UK road network (DfT Road Traffic Forecasts, 2015).

HE, in their "*The Road to Growth: our Strategic Economic Growth Plan"* recognised "supporting business productivity and competitiveness, and enabling the performance of SRN-reliant sectors" and "providing efficient routes to global markets through international gateways" as key criteria in their growth plan which shows that road freight is on HE's agenda for investment in the SRN. This can also be seen through HE's investments as part of their Road Investment Strategy 1 (2015 – 2020). KCC are hopeful that this investment will continue into their Road Investment Strategy 2 (2020 – 2025) and include further, much needed improvements along the strategic corridors connecting to major ports.

1.4 What are the regulatory and legal issues that, if changed, could improve freight efficiency without increasing costs or reducing efficiency?

<u>HGV road user levy:</u>

A fair proportion of the income raised from the HGV road user levy should be ring-fenced to mitigate the burden of international traffic on local communities and to reinvest in the UK road network and infrastructure. Increased maintenance budgets should be made available for roads with significant HGV volumes because this will increase maintenance standards and therefore journey time reliability and the fluidity of freight traffic.

Government statistics relating to road goods vehicles travelling to mainland Europe (Q3 2017) show that the Channel Ports handle over 88% of all foreign-registered HGVs entering the UK. Government understands that this figure will continue to grow as the concentration of HGV traffic increases around the Dover Strait as planned expansion at the Port of Dover and Port of Calais come forward. Kent's ports offer the most frequent, cost-effective short-sea crossing and KCC strongly ask Government to commit a fair proportion of this new revenue stream to safeguarding reliable access to these ports via the Channel Corridor (M20/A20 and M2/A2 routes).

KCC estimates, albeit indicatively, that of the total 406 miles travelled per trip by foreign-registered hauliers on UK roads, just over a quarter (27%) of this mileage is undertaken on roads in Kent. This assumes most HGVs travelling such a distance will do so via the SRN between the port of entry and the point at which they leave the county. KCC estimates the average return trip distance between Kent's Channel ports and the point at which the SRN leaves Kent (using the M25/A282 Dartford Crossing and M25 J5 as indicative points) to be around 112 miles.

Taking these high-level indices into account, KCC believes a fair proportion of the net revenue of the HGV road user levy to be in the order of £4.9 million per annum for Kent alone. Over time, this significant new revenue can make a tremendous contribution towards delivering a more resilient transport network and begin to safeguard high-quality and reliable access to Kent's ports, whilst better mitigating the impact of international traffic on roads in Kent and on local businesses and communities.

The Government's stance of the net revenue being absorbed by the Treasury without providing a firm commitment to reinvest in the resilience of the UK road network is unacceptable. This revenue should be hypothecated to mitigate the adverse impact and operational requirements of international road haulage along the Channel Corridor and towards safeguarding good access to UK ports.

2. <u>How might the demand for freight develop and change over the next 20-30 years?</u>

2.1 How has the demand for freight, and types of freight, changed over the last two decades, and what will be the drivers for changes in the future?

There has been an increase in cross-European freight transport by road. The DfT published the number of goods vehicles travelling between Great Britain and mainland Europe has increased by 84% in the last 20 years (DfT). Looking to the future the DfT forecast that HGV volumes will grow by 43% and Light Goods Vehicles (LGVs) by 88% by 2035. In addition, Government forecasts that Roll-on Roll-off (RoRo) traffic will grow by 101% by 2030. This would equate to 3.8 million HGVs using Dover with around 1.3 million of these using a new Lower Thames Crossing

2.2 How is the freight industry planning for future changes in the demand? What levers might be available to shape future demand for freight transport?

Both the Port of Dover and the Port of Calais have expansion plans. Calais is undertaking a €675 million expansion to increase capacity at the port with three addition berths and infrastructure to enable it to accommodate larger ships. Dover has committed £85 million to upgrade the Eastern Docks and revive the Western Docks, which is a significant step towards keeping the nation's trade moving. However, the success of this contribution is reliant on optimising the strategic road network. Insufficient capacity at any point within the strategic network can impede traffic flows to the ports and reduce its efficiency.

3. <u>What effect does congestion have on the efficiency of freight movements and emissions?</u>

3.1 How does congestion impact upon the productivity and economic contribution of freight? To what extent does congestion affect changes to mode, time or other freight choices?

HE's previous '*The Road to Growth'* report highlights the cost of congestion to the freight industry will be £14 billion in 2040 from a sector that provides 9% of GDP. In addition, 24% of businesses cite the quality of connections to international gateways as a barrier to exporting. These statistics demonstrate the need for improvements to the strategic routes to the Channel Ports, especially the M2/A2 which has inadequate capacity in many sections and at its key junctions. Enhancements are needed to relieve congestion and provide increased resilience for the M20/A20 route, especially with the delivery of a new Lower Thames Crossing which will create a new strategic route along the A2/M2 from the Port of Dover to the Midlands and the North.

In Kent, a range of upgrades are needed to ease congestion, improve productivity and generate economic growth. These have been set out in the answer to question 1.2.

<u>Enforcement of HGVs:</u>

KCC believe greater powers should be made available to local authorities to be able to enforce against HGVs flouting weight, height and width restrictions. Currently enforcement is carried out by the Police who often do not have the resource to enforce these restrictions. Alternatively, KCC Trading Standards can prosecute hauliers through the courts; however, this is a time-consuming method which often costs the Council more then it recoups in fines. A change in legislation (secondary legislation to enact Part 6 of the Traffic Management Act 2004) could allow for Penalty Charge Notices to be issued by councils. This could be done via an ANPR camera and run in a similar way to bus-lane infringements.

KCC does not have any powers to enforce against foreign registered vehicles. It is often frustrating (especially for residents/Parish Councils who conduct Lorry Watch schemes) that there is no effective mechanism for enforcement. In the first quarter of 2017, 88% of freight vehicles crossing the Strait of Dover were foreign registered. Residents often argue that there is no ability to stop foreign registered HGVs with outstanding road traffic offenses/fines at exit points to the UK. They ask if this could be something that government could explore.

However, regarding the problem of overnight parking, progress has been made with the DfT to enable more effective enforcement against inappropriate overnight lorry parking. The trial zonal overnight parking ban along the A20 between Charing and Ashford began on 30th October 2017 and is already showing signs of success. The trial includes a change to DfT guidance to allow clamping of first time offenders rather than only persistent offenders, and commenced following engagement with trade associations (FTA and RHA). Displacement is being monitored and Ashford Truck Stop has experienced increased demand. Such an approach to enforcement would be integral to the provision of a network of lorry parks but before a potential countywide roll-out could be implemented, sufficient official parking capacity is needed. It is this joint-working and innovative approach to the problem that KCC would like to see taken to other matters that can improve the efficiency of the freight system, and reduce its negative impacts.

3.2 How does congestion affect the environmental impacts of the movement of freight?

Congestion increases emissions and reduces air quality, therefore adding to the environmental costs of freight movements. Most areas along the Strategic Road Network (SRN) in Kent are Air Quality Management Area (AQMAs), therefore inefficient movement of freight through these SRN corridors between the UK and the Europe results in deteriorating environmental quality in addition to the economic cost of congestion.

3.3 With limited space for new infrastructure, how can we better use our existing urban network to support freight? Are there changes – such as changes to modes, methods, or delivery times that could help reduce the stress on the urban transport network?

Kent does not have a have large urban areas, instead a number of medium to large sized towns. Parking restrictions such as delivery times within the towns in Kent are implemented and enforced by the District/Borough Councils. KCC understand the need for parking and delivery bays to be made available and work with the District/Borough councils to facilitate this for both businesses and residents.

4. <u>How can freight reduce its carbon and air quality impacts?</u>

4.1 Are there efficiencies within freight management and distribution practices that could help reduce the CO2 and NOx emissions from freight?

Air quality issues are of growing significance in our urban areas as there is an increasing body of evidence to suggest health impacts begin at lower levels of exposure than previously thought. Many Kent towns have Air Quality Management Areas, which are often due to exceedances in NOx emissions.

Whilst we do not have any suggestions for how efficiencies in management and distribution practices could reduce emissions, we would support any improvements that can be made as we look to produce a Low Emissions Strategy for the county.

4.2 What role do alternative fuels such as electricity, Liquid Petroleum Gas and biofuels have to play? What are the barriers and challenges to wide-scale uptake of alternatives to diesel and what could be done to help remove these issues?

No comment.

4.3 What technologies could best and most realistically be utilised to manage the carbon impacts of freight, both within urban areas and on longer strategic journeys?

Whilst KCC is unaware of any specific technologies that can be used to manage the carbon impacts of freight, development in this area would be welcomed.

5. <u>How could new technologies increase the efficiency and productivity of UK freight?</u>

5.1 How will new technologies change the capacity and performance of the freight transport network? Over what timeframes might these new technologies begin to affect the freight transport network?

The emerging technologies for connected and autonomous vehicles (CAVs) are of great interest to us. They could not only improve the capacity and performance of freight transport, but potentially improve road safety and reduce emissions (by optimising engine output to reduce emissions, or by use of electric or alternative fuels). KCC would welcome the opportunity to trial CAVs on lane one of the M20 to see what benefits they can achieve.

5.2 How can the use of data such as real-time traffic information by artificial intelligence and machine learning systems help to improve freight efficiency and productivity? How might this affect the business models and requirements of freight in the future? Are there any barriers to the greater use of data in freight?

KCC has been involved with promoting and trialling technology to connect vehicles. The idea is for in-vehicle, vehicle-to-vehicle and vehicle-to-infrastructure communications to transmit warning information messages to the road user, which can include ‘road works ahead’ and ‘vehicles ahead braking’. The on-road technology wirelessly transmits the latest journey information directly to vehicles, which could suggest taking an alternative route for example. A similar system has been rolled-out in mainland Europe and a scheme on the A2/M2 corridor in Kent is being developed.

Transport Research Laboratory (TRL) has run two feasibility studies into a connected corridor along the A2/M2 between London and Kent. Similar schemes could be considered for HGV platooning in lane one of the M20 in Kent due to the high volumes of freight traffic travelling to and from the Channel Ports.

It is likely that the use of real-time traffic information by such systems would enable the careful timing of freight vehicle arrivals to the Channel Ports, and this would prevent queueing on the motorway network in times of disruption. KCC has previously commissioned research into the possibility of apps to pre-book slots at the Channel Ports but due to their just-in-time operation it has not been possible. Intelligent vehicle systems may be the missing-link that permit this, improving the efficiency of both the vehicle and the road network.

5.3 How do you see technologies such as HGV platooning, digital railway signalling, and autonomous vehicles being integrated into freight distribution?

As above, KCC would welcome the opportunity for a pilot of connected and autonomous freight vehicles along the M20 to the M25 along lane 1 only, specifically to assess how platooning of such vehicles could maintain fluidity of traffic at the port. This would complement the A2/M2 connected corridor trial in Kent looking at in-vehicle messaging.

5.4 How might regulations and physical infrastructure need to adapt to new technologies and business models in the freight sector?

For connected infrastructure, there will be a need for consistent technologies across the SRN and LRN and between vehicle manufacturers to ensure compatibility and regulations on autonomous vehicles. Lorry parking areas will be needed if timed journeys to the ports are implemented as HGVs will need somewhere to rest up until called to the port.

6. <u>What international experiences can the UK learn from to improve freight and reduce its carbon footprint</u>

In Europe, many governments have constructed or facilitated the construction of overnight lorry parking as part of rest areas and motorway service areas. The UK has fallen behind on the provision of overnight lorry parking. KCC believe that a lorry park fund (whether through HE or separately) should be set up to help local authorities (and the private sector) to build lorry parks that provide adequate facilities for drivers. Motorway service areas are a key quick-win in provision of overnight lorry parking facilities in the short-term, but longer-term it is dedicated commercial facilities that should be supported.

The Marches
Local Enterprise Partnership
Herefordshire - Shropshire -Telford & Wrekin

The Marches Local Enterprise Partnership (LEP) is driving accelerated economic growth through investment in innovation, higher level skills, housing and business sites across the region. It aims to deliver 70,000 homes and 40,000 jobs by 2031

The Marches region, which includes Herefordshire, Shropshire and Telford & Wrekin, is a dynamic business region where entrepreneurs flourish alongside global players. Covering 2,300 sq miles and with a growing population of 666,700, it is home to 29,800 businesses and a £12.3 billion economy

Bordered by the West Midlands to the east and Wales to the west, the Marches' key centres of population and employment are the city of Hereford and thriving towns of Shrewsbury and Telford. A network of 25 smaller market towns and a large rural area make up the rest of the settlement mix – with the Marches recognised as being one of the most enterprising regions in the UK.

The Marches LEP produced a Rail Study in 2014 which identified a prioritised list of improvements for passenger and freight services in the area, taking into account potential passenger growth, in order that rail can continue to support economic expansion in the region. In May 2016 the Marches LEP published its 'Investing in Strategic Transport Corridors in the Marches' report which provided evidence on the main transport corridors across the Marches. Since then, the LEP has been working in partnership with the Growing Mid Wales Partnership, and as part of this initiative, the two organisations jointly commissioned a Marches and Mid Wales Freight Strategy and a Technical Annex. The Strategy was launched in February 2018. Copies of each of these documents are attached and the LEP requests that the evidence contained within them forms part of the National Infrastructure Commissions evidence base.

Answers to the questions posed in the call for evidence document are below.

1. **What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?**

   1.1. What do you see as the key drivers to a successful freight system that is fit for the future?

Businesses want journey time reliability, resilience and continuity of network to allow them to make investments and grow businesses with certainty about meeting customers' expectations. Freight is not just about HGV and freight trains, DfT statistics show a steady increase in smaller vehicles LCVs (white vans) as the internet-driven economy accelerates, just in time business to business sales and online retail sales, etc. Much of the network used for this is the rural single carriageway network.

Having a network that is capable of real-time communication with drivers allows decisions to be made quickly regarding route planning to avoid delays. Comprehensive mobile phone coverage and further 4g investment is needed.

1.2. Which are the key freight corridors that matter the most? Where are the bottlenecks in the freight network, and what investments in upgrades could deliver the best value for money for freight efficiency and UK plc?

The Marches and Mid Wales Freight Strategy provides robust evidence for priorities within the strategy's interventions. The Industrial Strategy's aim to improve productivity and shape a stronger and fairer economy by spreading economic growth throughout the UK.

It is essential to ensure that investment programmes, reflect the transport characteristics and needs across the Marches and Mid Wales areas. Therefore as part of current work, we are prioritising our schemes, which are best suited to improve intra and inter-regional transport by road within and through these regions.

We are currently working to create a "joint appraisal framework". This will be used to assess potential interventions and road improvement schemes across the Marches and Mid Wales regions. It will be in line with formal WebTAG and WelTAG methodologies, and provide a prioritised list of projects, which will inform both the transport aspects of the LEP's new Strategic Economic Plan and Local Industrial Strategy due to be published in September 2018, as well as the Growing Mid Wales Regional Integrated Economic Plan also due later this year.

This work will provide evidence that Midland Connect, Highways England and DfT will have available for their reviews of the SRN and development of the MRN, which will form part of the key freight corridors, and the Welsh Government's National Transport Strategy review 2018/19.

1.3. To what extent are the economic benefits of freight factored into wider transport infrastructure investment planning?

Our joint regional strategy provides evidence to support the wider economic benefits that can be achieved through investing in the network outside of the large urban areas and so align with the Industrial Strategy, which highlights the need to for the UK as a whole to improve productivity and shape a stronger and fairer economy.

Our evidence demonstrates that by delivering a range of interventions to support freight it is possible to achieve growth regionally and nationally.

1.4. What are the regulatory and legal issues that, if changed, could improve freight efficiency without increasing costs or reducing efficiency?

The freight industry has highlighted that providing qualified HGV drivers takes too long and is expensive. Providing a system that reduces the time and expense in obtaining a licence would lead to more people coming into the industry, and thereby allow business access to a skilled workforce in the UK.

Access to suitable off-road facilities pose problems, to drivers and residences along freight corridors. Parking facilities are often full, expensive and insecure, therefore there is a need to improve and ensure minimum standards are delivered, which would encourage more female drivers into the industry.

2. How might the demand for freight develop and change over the next 20-30 years?

2.1. How has the demand for freight, and types of freight, changed over the last two decades, and what will be the drivers for changes in the future?

The UK will be leaving the EU Single Market and the Customs Union, what type of trading agreements the UK will have in the future, will determine how the freight industry needs to change to take account of the new opportunities and challenges. It is likely that there will be significant effects on current freight routing and storage requirements, changing destination ports and possibilities of changing warehousing and distribution with possibilities for customs free zones.

According to the Freight Transport Association, some 13% of HGV drivers and 26% of warehouse operatives are citizens of other EU countries and this implies that labour costs in the road haulage and wider logistics sector will rise, as a continuous supply of employees from the EU will no longer be available. Much existing freight activity is provided for by operators based outside the UK. As stated in the response to question 1.4, industry needs to change, to take account of likely upward pressures on labour costs as employers are squeezed to offer higher wages, pay for HGV driver training and improve working conditions to maintain their workforce requirements.

2.2. How is the freight industry planning for future changes in the demand? What levers might be available to shape future demand for freight transport?

No comment.

3. What effects does congestion have on the efficiency of freight movement and emissions?

3.1. How does congestion impact upon the productivity and economic contribution of freight? To what extent does congestion affect changes to mode, time or other freight choices?

Within the Marches and Mid Wales context, congestion on our network is generally due to resilience and road safety issues, which result in road closures. Further difficulties arise for HGVs, in that once they enter the extensive rural single carriageway network, it is often not possible to turn and therefore they have to wait until the network opens and moves again.

3.2. How does congestion affect the environmental impacts of the movement of freight?

No comments.

3.3. With limited space for new infrastructure, how can we better use our existing urban network to support freight? Are there changes – such as changes to modes, methods, or delivery times - that could help reduce the stress on the urban transport network?

No Comments

4. How can freight lower its carbon and air quality impacts?

4.1. Are there efficiencies within freight management and distribution practices that could help reduce the CO2 and NOx emissions from freight?

On the rural road network in the Marches and Mid Wales areas, the need is both to reduce journey times and increase journey time reliability. This can be achieved by providing improved road surfaces and reduce/take out bends in the highway as well as ensuring consistency of width to allow HGVs in opposing directions to pass on these single carriageway routes. This type of interventions result in HGV and vehicles not needing to change up and down the gearbox as frequently and reducing the frequency to need to apply the brakes. These in turn reduce tyre wear and reduce emissions.

4.2. What role do alternative fuels such as electricity, Liquid Petroleum Gas and biofuels have to play? What are the barriers and challenges to wide-scale uptake of alternatives to diesel and what could be done to help remove these issues?

The difficulty for the freight industry is having access to alternative fuels in distant rural locations. In order for this to change, there investment is needed to ensure availability at widely dispersed locations to insure coverage, which then allows a combination of choices and access to fuels for business resiliently, which will support and reinforce behaviour change.

The level of fuel duty applied to alternative fuels will pay a part in the decisions that business take regarding moving to new fuels as will confidence around price and duty levels over expected life of new investments in alternative fuelled fleets.

4.3. What technologies could best and most realistically be utilised to manage the carbon impacts of freight, both within urban areas and on longer strategic journeys?

Rail freight may be able to provide an opportunity to shift some road freight to rail in some markets. However, road freight will remain by far the dominant mode for freight transport in both the Marches and Mid Wales, because of the generally dispersed pattern of settlement and economic activity, (which reduces the critical mass of traffic to fill a train for any particular location). There are issues related to the infrastructure, which reduce the capacity and capability of the rail network to accommodate freight services here. Without very significant investment in infrastructure, it is not achievable.

5. How could new technologies be utilised to increase the efficiency and productivity of UK freight?

5.1. How will new technologies change the capacity and performance of the freight transport network? Over what timeframes might these new technologies begin to affect the freight transport network?

With the increasing use of satellite navigation systems, there is a need to ensure that the managers of HGV fleets and their drivers have up-to-date information on the status of structures such as bridge heights and width restrictions on roads. The Freight Strategy proposes that local authorities in the Marches and Mid Wales should contribute up-to-date data on structures and regulations affecting the highway network at a local level to the Ordnance Survey National Digital Road Map Database, so that this information can be made available to the major satellite navigation system manufacturers and software and data providers. The local authorities should also provide the same information to private sector freight transport planning portals, such as the internet-based Freight Journey Planner; the latter will not be effective unless mobile phone connectivity is adequate throughout the area. This type of commitment to provide information needs to be matched by investment in the mobile phone 4g capacity and availability.

5.2. How can the use of data such as real-time traffic information by artificial intelligence and machine learning systems help to improve freight efficiency and productivity? How might this affect the business models and requirements of freight in the future? Are there any barriers to the greater use of data in freight?

As above, it would be good if the industry shared information and could share space. However, this type of information sharing across the industry is not normally welcomed because these are businesses that compete with one another, and they would not wish to give a competitive advantage to a competitor.

5.3. How do you see technologies such as HGV platooning, digital railway signalling, and autonomous vehicles being integrated into freight distribution?

The main technological change in the road haulage industry up to 2030 at a national level may be the introduction of ‘platoons’ of HGVs that travel together on the strategic highways network and provide fuel efficiencies to road hauliers due to being more aerodynamic. These would not be genuinely autonomous vehicles because they would still require a driver to be located in each cab. Without significant technological improvements it seems unlikely that these platoons would be seen on the Marches and Mid Wales road network apart from on the M54 and the M50. These platoons would reduce overtaking opportunities, except on motorways and dual carriageways, and raise concerns about safety as well as efficiency of the network for other users.

The HGV fleet will gradually become cleaner as road hauliers increasingly invest in new HGVs conforming to Euro VI standards. These vehicles meet stricter emissions standards under both laboratory and real world conditions and remove almost all emissions of particulate matter and reduce nitrogen oxide emissions from HGVs by up to 95%. Further improvements in engine technology up to 2030 may focus to a greater extent on increasing the efficiency of diesel engines and therefore reduce emissions of carbon.

The Mid Wales railway lines have ERTMS Digital signalling system. This has isolated the Cambrian Rail network from the rest of the national network and therefore prevents other operators using the infrastructure. There is limited rolling stock to meet current limited passenger services and no additional available to other operators or to develop more customer responsive or freight services. The future of digital rail must ensure there is sufficient investment in rolling stock to be able to access the network and meet needs of service providers and customers.

5.4. How might regulations and physical infrastructure need to adapt to new technologies and business models in the freight sector?

Given the UK Government's decision to ban the sale of diesel and petrol cars and LCVs from 2040. It seems increasingly likely that the industry will gradually take-up a change in fuel, or moves to electric HGVs and LCVs at a national level for relatively short distance flows. But, without a step-change in battery technology, this is most likely to be for deliveries from distribution centres located close to the major conurbations rather than to towns and cities located in more peripheral locations and will present a major challenge in areas more distant from distribution hubs and major centres.

6. Are there good examples internationally of freight systems, policy, infrastructure or technology development and implementation that the UK can learn from to increase freight efficiency and/or reduce the carbon and congestion impacts?

Deliveries of parcels by bicycle are already possible in urban centres and this concept could be expanded to many other towns for lightweight and smaller parcels, particularly as separate infrastructure is developed for cyclists.

With the increased importance of e-commerce, which involves the delivery of smaller parcels rather than larger consignments to retail outlets, the international parcels delivery companies that work for e-commerce retailers are more prepared to hand over parcels for 'last mile' deliveries to local courier companies for city centre deliveries and for deliveries to relatively remote locations such as parts of Shropshire, Herefordshire and Mid Wales.

Midlands Connect's response:
<u>FREIGHT STUDY: CALL FOR EVIDENCE (deadline 5th March)</u>

https://www.nic.org.uk/wp-content/uploads/Freight-Study-Call-for-Evidence-Jan-2018.pdf

<u>Key Suggestions</u>

1. Focus on current and future economic opportunities the freight network is seeking to support, eg off-site construction and agriculture;
2. Identify key corridors in particular to international gateways like airports and ports;
3. Ensure solutions are scalable and there is an appropriate means to co-ordinate effective roll-out, particularly for digital solutions.

<u>Executive Summary</u>

- o The Midlands is already a crucial testbed for the UK transport network – being the largest economy outside London worth £207 billion and within 3-hour reach of 78% of the UK population the Midlands is vital to both labour and goods markets.
- o With 90% of inter-regional freight moving by road it is disappointing that passenger satisfaction for motorways is lower in the Midlands than anywhere else in the country[1]. Our road and rail networks are vital to labour market and customer access and our businesses are eager to pioneer new opportunities.

- o Midlands Connect is the Sub-National Transport Body representing 23 Local Authorities, 9 LEPs, business representatives and national agencies - from the Welsh border to the Lincolnshire coast.
- o In March 2017, Midlands Connect published a 25-year transport strategy which included key considerations for freight and connections to international gateways. A separate report on our 'Freight Narrative' was also published setting out key recommendations both road and rail improvements.

- o Midlands Connect's analysis identified key freight corridors through the Midlands and assessed constraints on both rail and roads. The corridors identified for freight are crucial for international gateways, from ports and airports, which support growing exports from the Midlands - with over £40bn of goods were exported in 2016, outstripping national growth.

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[1] Page 10, National Road Users' Satisfaction Survey 2016-17, Transport Focus http://d3cez36w5wymxj.cloudfront.net/wp-content/uploads/2017/07/06163600/NRUSS-Report-July-17-FINAL.pdf

Responses to Questions:

1. *What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?* *1.1. What do you see as the key drivers to a successful freight system that is fit for the future?* *1.2. Which are the key freight corridors that matter the most? Where are the bottlenecks in the freight network, and what investments in upgrades could deliver the best value for money for freight efficiency and UK plc?* *1.3. To what extent are the economic benefits of freight factored into wider transport infrastructure investment planning?* *1.4. What are the regulatory and legal issues that, if changed, could improve freight efficiency without increasing costs or reducing efficiency?*

1. Midlands Connect has undertaken a substantial study of Road & Rail Freight at a Midlands scale and can provide more of the background evidence on request from the NIC.

Freight Narrative Report:
https://www.midlandsconnect.uk/media/1108/freight_narrative_report.pdf
Executive Summary: https://www.midlandsconnect.uk/media/1148/mc-freight-summary.pdf

Constraints and Opportunities

2. Whilst rail plays a key role in providing efficient movement of goods over longer distances, about 90% of inter-regional freight is transported by road. The Transport Secretary has voiced an admirable aspiration to move more freight onto rail and there may be opportunities to utilise rail and light rail stations more to host goods stores as part of the 'last mile' for customers.
3. Urban congestion is a major barrier to unlock concepts like 'Mobility as a Service' (MaaS) and businesses will have to work with freight companies to unlock new supply routes. Recent business surveys from Chambers of Commerce show how 70% businesses are calling for infrastructure investment in cities to unlock valuable commuter and goods routes[2]. Already our partners, including local authorities, LEPs and Rail Forum East Midlands, are bringing together Business Improvement Districts, supply chain companies and new businesses coming to Birmingham to understand the future needs and opportunities our cities can accommodate. The **Greater Birmingham Chamber of Commerce has already invited NIC to a workshop on this subject in March** with civic and business Leaders.
4. Midlands Connect also strongly advocates that we consider freight in the round, understanding the capacity constraints from roads to rail and through cities and corridors. NIC should consider the full economic potential from freight as there is much to **showcase our rural economies from the Welsh border to the Lincolnshire**

[2] Research by Greater Birmingham Chamber of Commerce
https://www.greaterbirminghamchambers.com/media/261308/congestion-research_webready.pdf

coast, for instance pioneering activities like the recently launched Marches and Mid Wales Freight Strategy[3].

Road Corridors

5. Logistics centres will be a key focus for freight routes now and in the future. There are two key concentrations of National Distribution Centres for the UK: (1) near the M5/M6 junction in Birmingham and the Black Country, and (2) along the M1 corridor, centred on the Leicester-Coventry hub.
6. The M5/M6 is already congested all day, which the Smart motorway and public transport upgrades are not stemming, whilst the Leicester/Coventry hub will benefit from the completion of key expressways (particularly around Stoke and Coventry), junction treatments at M1 J21 and M6 J15, and Smart Motorway treatment for key sections of the M40, M42 and M5. The M6 north of Birmingham in particular has been singled out by the Freight Transport Association (FTA) as being one of the three sections of road infrastructure nationally that are most in need of Government investment. Ultimately, attempts to divert traffic away from the areas, will remain vulnerable to local traffic consuming all of the benefit.
7. HGV traffic is very concentrated on the strategic roads serving these hubs, together with a few other roads (such as the A1) that pass through the Midlands. A transformative solution for freight will require both consideration of the Strategic Road Network, the Major Road Network and local roads. **Midlands Connect can provide more information on our preferred options to relieve pressure on the M5/M6 through the Midland Motorway Hub study**, including Smart Motorway solutions to direct congested routes to the M6 Toll, which will report in 2018.
8. Our Freight Narrative in 2017[4], already set out some specific interventions that could support freight growth in the Midlands, including:
   a) Targeted Smart Motorway schemes
   b) Pinchpoint schemes, typically grade-separation at roundabouts
   c) M5/M6 junction area – consider restricting junctions to reduce local traffic using motorway, alongside consideration of a large-scale widening scheme
   d) M42 east side of Birmingham Box – consider widening and junction upgrades to allow UK Central office developments, which are likely to generate severe evening peak congestion
   e) Longer term capacity schemes on principal national corridors

International Gateways

9. Freight priorities come particularly to life in regards to serving international gateways, including airports and ports. The Midlands is the largest economy outside London in the UK, worth £207 billion, and exports over £40 billion goods per annum. Between 2010 and 2013, exports from the Midlands increased by 37% compared to the UK average of 15% (Regional Trade Statistics 1996-2015).
10. The next decade is a crucial time for the UK economy and the Midlands Engine aims to play a central role in attracting trade and investment to the UK. Our 2017 strategy

[3] https://www.marcheslep.org.uk/download/Reports/reports/Marches-Mid-Wales-Freight-Strategy.pdf
[4] https://www.midlandsconnect.uk/media/1148/mc-freight-summary.pdf

sets out transport priorities for businesses but our potential will remain untapped if we do not access more international markets. If we succeed the prize is substantial, unlocking up to £5 billion GVA per annum and 300,000 jobs by 2040.

11. East Midlands Airport operates 24/7 and is the UK's leading airport for dedicated freight services handling 350,000 tonnes of cargo per annum – it is pioneering new approaches to goods handling and can distinguish express freight to enable next day deliveries. (It is worth noting that whilst air freight accounts for less than 1% of total international trade volumes, the total value of goods transported by air represents 35% of all international trade). Particularly topical, the value of non-EU trade that is imported and exported through the airport over a 12 month cycle equates to £10bn.
12. Whilst Government has made it clear how growth at Heathrow can benefit the country, there is also recognition in the aviation strategy of the opportunity to 'Make Best Use' of regional capacity. Freight through Heathrow may not be the most efficient journey for make businesses and therefore does not offer the cleanest solution. Midlands Connect **recommend that NIC consider how further implementation of the 'Make Best Use' policy can unlock freight capacity across the country**.
13. The East Midlands is the hub of air parcels traffic for all of the global express operators, such as DHL, UPS, TNT, Amazon and the Royal Mail, and includes direct longhaul freight services to major freight hubs in the USA, Dubai and Hong Kong, and substantial tonnage to Sub-Saharan Africa, Asia and North America. East Midlands Airport has unparalleled access to the UK market which is dependent on effective road and rail links – currently 83% of the national GVA is within reach in 4 hours drive from the airport, against 78% for Heathrow and 70% for Stansted[5]. If NIC look at key business outcomes, access to airports will be prominent and offer the gateway to post-EU trade opportunities – in the Midlands our two airports have capacity to grow further, with options to improve road and rail access, including alongside the arrival of HS2.
14. Midlands Connect aspiration is to get HS2 right, including for freight routes. The proposed Innovation Campus at Toton could unlock 7,000 jobs supporting freight growth at the heart of the HS2 and classic rail networks. We are currently **working with Government to consider partially opening East Midlands HS2 Hub[6] in the 2020s and ensure capacity on the classic network and freight lines are unlocked**.

Rail corridors

15. Rail is more efficient than road in two important sectors which make it vital for long haul business routes – transporting containers, often as part of intercontinental supply chains, and carrying bulk goods, for instance oil from the Humber ports, or stone from the quarries. The key corridors include Felixstowe-Midlands corridor, and the Midland Main Line for stone.
16. With the landmark investment in HS2 relieving capacity on the main north-south lines, the prime capacity issue is where the east-west freight traffic coincides with the expected increase in the number of east-west fast passenger services. The biggest pinchpoints are where this also coincides with north-south traffic (freight and

[5] Page 103 https://www.midlandsconnect.uk/media/1107/international_gateways_narrative_report.pdf
[6] https://www.midlandsconnect.uk/latest-news/midlands-connect-agrees-priorities-for-east-midlands-hub-station-with-government/

passenger) at Leicester, and with Birmingham-Derby traffic at Water Orton (east of Birmingham).

17. Our 2017 strategy[7], set out options that could mitigate medium term constraints across the Midlands, including:
    a) supporting affordable schemes further east, particularly at Felixstowe and Ely;
    b) improvements to the Water Orton junction, just east of Birmingham, will provide approximately 50% more capacity;
    c) restoring four tracks through Leicester, to eliminate unnecessary conflicts; and
    d) modern signalling Peterborough-Leicester (currently recommended by Network Rail for funding before 2024).

The Last Mile

18. To unlock business capability in reaching customers one key area to focus on is moving local car traffic off the motorways in urban areas. The Transforming Cities Fund can enable some options but further investment will be required, including through the Major Road Network (MRN). We would **recommend looking further at how innovative solutions can be incorporated or piloted through the new MRN**.
19. Midlands Connect believe there could be potential for rail to re-enter the express freight market, possibly by using capacity on passenger trains or goods stores at stations. There may also be potential to use trains to deliver to city centres from outlying distribution centres, with last mile delivery by zero emission vehicles. **In terms of improving air quality NIC should focus on efficient journey times** alongside new fuels.

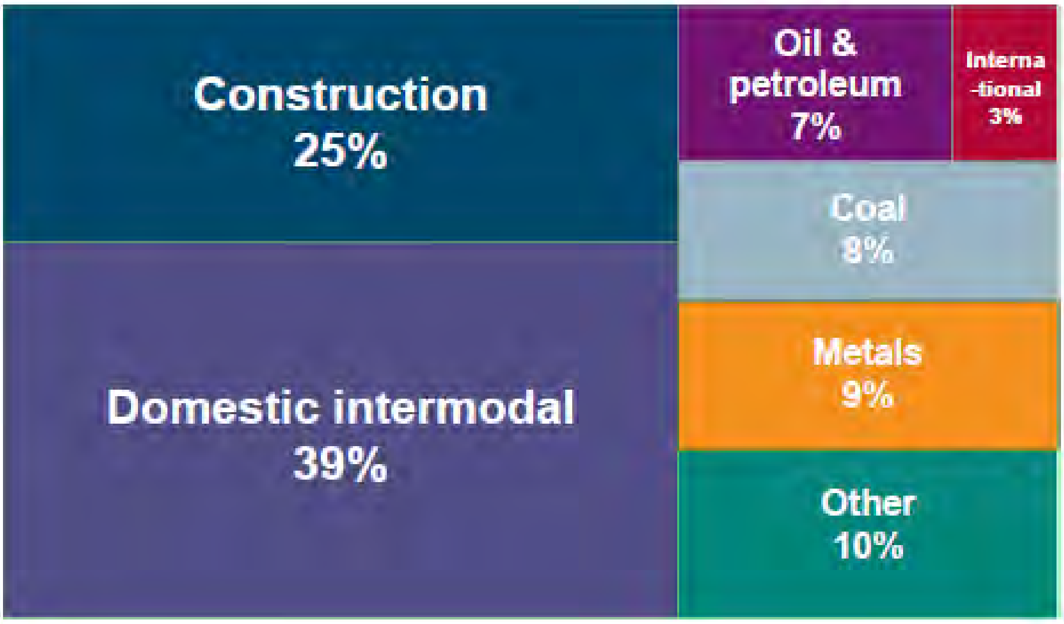
2. How might the demand for freight develop and change over the next 20-30 years? 2.1. How has the demand for freight, and types of freight, changed over the last two decades, and what will be the drivers for changes in the future? 2.2. How is the freight industry planning for future changes in the demand? What levers might be available to shape future demand for freight transport?

Sensitive industries - logistics

1. The Midlands is at the heart of Britain's logistics system, accounting for approximately 20% of UK jobs and GVA. The logistics industry will revolutionise over the next decade, with autonomous vehicles and drones alone having the potential to transform our transport behaviours.
2. Logistics activity is currently strongest adjacent to the strategic transport networks from Stoke-on-Trent in the north west to Milton Keynes in the south east but is most heavily concentrated in the 'golden triangle' in Northamptonshire and Leicestershire. The UK's leading freight-focused airport at East Midlands Airport makes for a compelling reason to ensure continued competitiveness and could be at the heart of technological innovation.
3. Freight is also crucial for construction sectors, with 10 million tonnes moved per annum including granite and limestone from the Peak District. If NIC focus on economic outcomes, examples emerge for instance showcasing how stone routes

[7] Page 33 https://www.midlandsconnect.uk/media/1100/midlands-connect-strategy-march-2017.pdf

are vital for the Government's growing housing agenda. Whilst current freight routes predominantly serve the south east the rise of off-site construction could shift freight demand to areas like Staffordshire. We would **recommend NIC consider particular business outcomes that freight is and can serve in the future**.



[8]

3. What effects does congestion have on the efficiency of freight movement and emissions? 3.1. How does congestion impact upon the productivity and economic contribution of freight? To what extent does congestion affect changes to mode, time or other freight choices?

[8] DfT stats Table TSGB0402 https://www.gov.uk/government/statistical-data-sets/tsgb04-freight

4. How can freight lower its carbon and air quality impacts?

4.1. Are there efficiencies within freight management and distribution practices that could help reduce the CO2 and NOx emissions from freight?

4.2. What role do alternative fuels such as electricity, Liquid Petroleum Gas and biofuels have to play?

What are the barriers and challenges to wide-scale uptake of alternatives to diesel and what could be done to help remove these issues?

4.3. What technologies could best and most realistically be utilised to manage the carbon impacts of freight, both within urban areas and on longer strategic journeys?

5. How could new technologies be utilised to increase the efficiency and productivity of UK freight?

5.1. How will new technologies change the capacity and performance of the freight transport network? Over what timeframes might these new technologies begin to affect the freight transport network?

5.2. How can the use of data such as real-time traffic information by artificial intelligence and machine learning systems help to improve freight efficiency and productivity? How might this affect the business models and requirements of freight in the future? Are there any barriers to the greater use of data in freight?

5.3. How do you see technologies such as HGV platooning, digital railway signalling, and autonomous vehicles being integrated into freight distribution?

5.4. How might regulations and physical infrastructure need to adapt to new technologies and business models in the freight sector?

4. As part of the Midlands Engine, Midlands Connect is driving forward opportunities to roll-out the innovation being pioneered in the Midlands. Our 2017 strategy[9] sets out how we plan to encourage the use of technology to reduce the need to travel, Connected Autonomous Vehicles and Network Rail's digital railway ambitions, which are at the heart of the Rail sector deal proposal and which will be developed by businesses particularly in the East Midlands.
5. Some of the problems are clear, for instance the Institute for Mechanical Engineers state "there are on average 150 million preventable lorry miles each year due to poor route selection"[10] – this can be improved by better quality, live traffic information and effective multi-modal planning. Midlands Connect welcome the IfME's clear aspiration to make "logistics networks simpler for customers to understand".
6. By leading growth in technology from the Midlands, including driverless cars or piloting platooning of freight vehicles, the UK can become a global centre of excellence for application of these technologies in a sustainable environment where defined standards and legal and regulatory boundaries can be established. This will enable

[9] Page 4 https://www.midlandsconnect.uk/media/1100/midlands-connect-strategy-march-2017.pdf
[10] Page 2 https://www.imeche.org/docs/default-source/1-oscar/reports-policy-statements-and-documents/uk-freight---in-for-the-long-haul.pdf?sfvrsn=2

manufacturers to produce globally-accepted products driving accelerated market demand and economic growth.

7. So far the 'sharing economy' has emerged utilising the growth of publicly-available real time travel information. But recent business surveys suggest social media are still the most commonly used applications (36%)[11] and whilst new technology is emerging it is not consistently rolled-out or co-ordinated to make applications universally applicable. **Midlands Connect's priority is to ensure any digital pilots are scalable** and we offer a role in helping more areas take up the new opportunities arising.

6. Are there good examples internationally of freight systems, policy, infrastructure or technology development and implementation that the UK can learn from to increase freight efficiency and/or reduce the carbon and congestion impacts?

[11] Page 5 Research by Greater Birmingham Chamber of Commerce https://www.greaterbirminghamchambers.com/media/261308/congestion-research_webready.pdf

Campaign for Better Transport

National Infrastructure Commission's call for evidence on its Freight Study ~ Response from Campaign for Better Transport

February 2018

Campaign for Better Transport is a leading charity and environmental campaign group that promotes sustainable transport policies. Our vision is a country where communities have affordable transport that improves quality of life and protects the environment.

Campaign for Better Transport is pleased to comment on the National Infrastructure Commission's call for evidence on its Freight Study.

Summary

To meet the challenges of current and future freight provision, we submit evidence in support of the following points:

- There is a need for cross-modal transport planning by Government
- Corridor research, sponsored by DfT, shows investing in rail can reduce road congestion, pollution & collisions
- More rail freight capacity and capability are needed to satisfy suppressed demand
- There is a need to make road freight more efficient to reduce its adverse impacts
- There are significant benefits in putting road and rail on comparable charging systems
- Track charges for HGVs are not differentiated by weight or type of road
- There is a need to reform the HGV and rail freight charging systems to remove the disparity between HGVs and rail freight
- There is a need to calculate and consider all the external cost of HGV use
- Distance based HGV charging could transform freight transport
- We have evidence to dispel the myths about the benefits of ever larger heavier lorries
- Strategic Rail Freight Terminals can facilitate big growth in rail freight volumes
- Vans as a sector are lacking in regulation and consolidation
- The safety costs of freight should be evaluated and considered

We would highlight the omission of the crucial topic of external costs and charging of freight not covered in the questions; of which safety, not mentioned, is a key element. The single most effective change to achieve all the Government's stated objectives of improving efficiency, reducing exposure to collisions, and reducing air and CO2 pollution would be to replace the existing time-based lorry charging system with a distance-based system which could relate charges paid to the real impacts HGVs have on other road users and the road network. In addition, we draw your attention to our earlier response to the NIC Interim report, in particular our challenge to its unhelpful comments about rail freight. [1]

[1] Freight on Rail response to National Infrastructure Commission interim report: Congestion, Carbon Priorities for National infrastructure – January 2018

1.What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?

There is a need for cross-modal transport planning by Government.

Proper cross modal transport planning by government is needed. A recent example of silo planning approach is the way the Highways Agency route strategies in advance of RIS1 did not even have the parallel rail routes included in the corridor studies for A14, A34, M6 despite the fact they carry large quantities of freight by rail.

Our Department for Transport (DfT) sponsored research of April 2017, *Impact on congestion of transfer of freight from road to rail on key strategic corridors,* confirms the point, that integrated rail and road planning is the best way to reduce road congestion, collisions and pollution. Furthermore, it shows that the use of averages can be misleading. In the case of certain strategic transport corridors, it is possible to improve road conditions without needing to add more road capacity. If long distance consumer freight and construction materials can be transferred to rail, the productivity and reliability of existing road services will improve without needing to add any extra lanes of motorway.

We are concerned that the NIC interim report, issued in October 2017, quoted DfT statistics which used average figures rather than corridor analysis: we advise that the NIC Freight Study must not rely on averages. Our research shows that using national averages in transport planning, as in the NIC interim report, instead of analysing individual corridors where there are parallel rail routes, can be misleading.

For example, the 33 freight trains in and out of Felixstowe already remove around 2,500 lorries per day off the congested A14 corridor. Rail freight could be increase by 50 or 60 per cent on both the A14 and A34 out of Southampton Port within the next five to seven years based on a combination of current funded CP5 Network Rail projects and the- as yet- unfunded proposals in the Network Rail Freight Network Study for the Control Period 6 until 2024.

The following DfT statement supports corridor analysis and recognises that integrated rail and road planning into a cross-modal approach is the best way to reduce road congestion, collisions, and pollution. DfT said: "*We agree with the Campaign for Better Transport that rail freight offers real benefits for the environment and helps keep bulky loads off of the road network, helping to ease congestion for other motorists. We look forward to using these findings to help inform our coming road and rail strategies and are committed to working with the rail freight industry to support growth of the sector."*

Corridor research, sponsored by DfT, shows investing in rail can reduce road congestion, pollution & collisions

Research by MTRU that we commissioned shows that upgrading the existing rail lines which run parallel to key congested motorway routes would allow large numbers of lorry loads to be transferred to rail, easing congestion, improving air quality and reducing road collisions.

The research examined the socio-economic benefits of upgrading existing rail lines on four heavily congested routes: the A14 between Felixstowe and the Midlands, the A34 from Southampton to the Midlands, and the M6 and M62 motorways, which together carry around 37,500 of the large HGVs every day. Transferring 2000 HGVs, equivalent to up to 8000 cars, from each of these corridors every day to rail would significantly improve road conditions without needing to add extra road capacity and would reduce nitrogen oxide emissions by 10 per cent and particulates by 7 per cent per corridor. Furthermore, national carbon dioxide emissions could be reduced by 2.5 per cent and killed and seriously injured figures reduced by 18, nationally if these four corridors were upgraded. [2] [3]

More rail freight capacity and capability are needed to satisfy suppressed demand. There is considerable suppressed demand for more consumer and construction rail freight services on key corridors such as the A14, A34 and M6, so capacity upgrades could remove serious numbers of the large long-distance lorries from congested routes.

1.1 What do you see as the key drivers to a successful freight system that is fit for the future?
The charging regime needs to be changed so that rail and road are brought into line with each other; currently, HGVs are heavily subsidised so distorting the market. MTRU research published in January 2018 analyses the extent to which HGVs do not internalise their costs. [4]
The research, using DfT values, shows that HGVs are only currently paying around 32 per cent of their external costs, which is not sustainable. Charges should reflect the costs of climate change, collisions, road infrastructure damage as well as the costs of congestion to the economy. These impacts are severe and are not reflected in the level or structure of current taxation of HGVs in terms of miles driven and therefore the congestion, infrastructure track costs, pollution, and safety impacts.
Until there is wider acknowledgement of the need for transparency of the external costs of freight delivery it will be difficult to control its adverse impacts. For example, if the full costs of next and same day deliveries were properly factored into product prices, this would affect demand.
Modal shift to rail would reduce road congestion and thus improve productivity and reduce pollution and collisions. See DfT Mode Shift Benefit table P6 and
http://www.freightonrail.org.uk/PDF/MTRU_addendum_to_the_2014_research_issued_in_Jan_2018.docx

We need to make road freight more efficient to reduce its adverse impacts.
HGVs are competitive but not efficient. Government figures show that nationally 30 per cent of lorries are driving around completely empty, a figure which has been growing for some years. [5] DfT figures indicate that only 34 per cent of HGVs were constrained by volume, 13 per cent by weight and only 19 per cent limited by weight and volume in 2016 [6] : this shows the potential to increase vehicle load factors by between 30-45 per cent with the right policies.
Given that the marginal external costs are far higher for road than rail, a new charging regime for HGVs provides an opportunity to move towards a user pays principle to level the playing field between the modes.

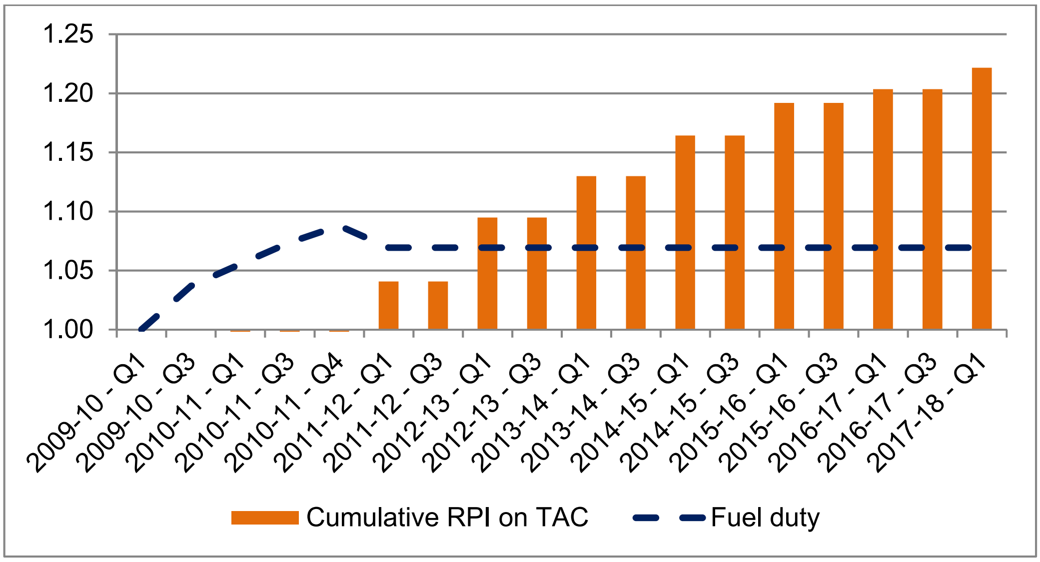
While road and rail compete intensely, the modes also work collaboratively. We urge the NIC to recognise the strength of each mode and seek to leverage those strengths to maximise benefits and improve overall outcomes.

There are benefits in putting road and rail on comparable charging systems.
Introducing a distance-based road charge for HGVs would put road freight on a more similar footing to rail freight, which already pays a distance-based charge.
The setting of charges for the movement of freight by rail is considered in a completely different way to the setting of charges paid by the movement of freight by road. An HGV distance-based levy creates the opportunity to introduce a more parallel process for setting and structuring charges.
Rail access charges are set every five years by the Office of Rail and Road (ORR). The basic charge is set based on detailed costing, calculated by Network Rail. In accordance with the Railways (Access, Management and Licensing of Railway Undertakings) Regulations 2016 the minimum charges must be set at the cost that is directly incurred as a result of operating the train service. In addition, mark-ups can be levied

[2] Campaign for Better Transport: Invest in rail freight to cut road congestion, research shows 21 April 2017
[3] Campaign for Better Transport: New research shows just 2,000 less HGVS would mean a ten per cent reduction in air pollution 20 December 2017
[4] MTRU: Impact on congestion of transfer of freight from road to rail on key strategic corridors (March 2017)
[5] DfT: Empty running figures tables RFS0117 (July 2017).
[6] DfT: CSRFT data for 2016 issued in 2017 for Freight on Rail

where it is deemed that the market can bear to pay them. The setting of rail access charge is done following a Periodic Review process, which is led by the ORR. This process lasts around 3 years and requires considerable engagement and input from rail freight operators. Charges once set are increased by retail prices index (RPI) every April.

As a result, rail freight operators face uncertainty on a five-year basis over what future charges will be, but road hauliers do not face this uncertainty. Even without the changes implemented through the periodic review process rail access charges have increased by around 22% since fuel duty was frozen in 2011. The increases in charges paid by rail freight operators, but not by HGVs have had the impact of making it gradually harder for rail freight operators to compete with HGVs over this period. See graph below which shows changes to fuel duty levels and actual Retail Price Index increases applied to rail track access charges against a base of 1, since 2009.



Combined Vehicles

There is currently a discount applied to Vehicle Excise Duty in respect of Combined Vehicles – i.e. those lorries that are used as part of a multi-modal journey. The discount applied is around £600 per annum, but this is not sufficient to have a great impact or incentive. An HGV levy could be further used to allow a discount for lorry moves within a certain radius (say 25 miles) that are undertaking the final legs of journeys, where the trunk haulage has been undertaken by rail or water.

Difference in the way track costs are calculated for the two modes.

Rail freight costs are calibrated to take into account all the parameters of the wagon and loco, in order for the specific charges to reflect the impact that the rolling stock has on the network. (i.e. not just weight but vertical damage impact from bogies. Freight operators pay the cost directly incurred from running the train on the network. This is set on the basis of short-run variable costs. Variable Usage Charge is the largest component of direct charges. It is designed to equal the operating, maintenance and renewal costs that vary with traffic. The Vehicle Track Interaction Strategic Model (VTISM) models the variation in track damage between a range of different vehicle parameters, which drives a specific variable charge for each wagon and locomotive.

Furthermore, fixed costs are allocated for each commodity across the network based on the modelled costs of circa 3,100 individual track sections. These are then allocated based on traffic across each section. For the commodities assessed as being able to bear a mark-up additional charges are set to recover a contribution to the fixed costs of the network through a Freight Specific Charge.

So, rail freight already has a distance-based charge based that varies depending on the axle weight and suspension type of vehicles, to reflect variable damage to the rail track, and to encourage behaviours such as fitting more track friendly suspension to wagon fleets.
There is a risk that the complexity of rail freight charges creates an uneven playing field between road and rail. It would seem appropriate to take a similar approach to road and it is suggested that the appropriate categories suggested are vehicle weight, number of axles and Euro emission class.

Track charges for HGVs are not currently differentiated by weight or type of road.
The charging does not distinguish between different types and weights of HGVs within the 3,5 to 44 tonne weight range. The largest and heaviest HGVs, (mostly but not entirely articulated), cause a great deal more damage to foundations and structures of roads than cars. This is because the damaging power rises exponentially as weight increases. This is called the ***Generalized Fourth Power Law***. The standard six-axle 44 tonne 16.5 metre truck is 138,000 times more damaging to road surfaces than a Ford Focus. Therefore, some of the heaviest road repair costs are therefore almost exclusively attributable to the heaviest vehicles. Motorways are constructed to a higher specification than local-authority-run roads to cater for heavy goods vehicles, but it is the latter which make up almost 98% of our network which explains the poor repair of many local authority-controlled roads.

There is a complex performance regime that rail freight operators must administer, of which there is no equivalent on the road network. The charging regime for road is in effect fuel duty, which is very simple and has been frozen since 2011 and there are no fixed costs of the UK road network allocated to different sectors of road users. It is interesting to compare the work recently undertaken by the FTA on the costs caused by HGVs on the UK's road network and the scrutiny of the equivalent in the rail sector, despite rail only moving about 12% of freight in the UK.

The RepGraph report for the FTA "*Heavy Goods Vehicles: Do they pay their way? - impacts on road surfaces"*, November 2017, muddles two different costing methods and comes to the wrong conclusions and thus the wrong figures. The RepGraph report helps to illustrate the need to understand the complexities of costs and revenues. It sets out the total tax take from HGVs including fuel duty and compares it to the overall costs of road expenditure and road maintenance. It also compares this to the Mode Shift Benefit values for infrastructure, but unfortunately it conflates two different and recognised costing methods (ie marginal external cost method and the fully allocated cost model) to come to grossly inaccurate conclusions. Thus the RepGraph approach has four fundamental flaws:

- Inclusion of fuel duty (£4,093m) as though it is hypothecated income which can be counted against HGV infrastructure costs – there are no plans for this. The actual hypothecated figures from HGVs is £291 million form the DfT tax income plus £50m estimated from the RUL = £340m
- Using an out of date DfT value for infrastructure of 9 pence per mile instead of the 2015 figure of 18 pence per mile
- Complete omission of any marginal external costs other than infrastructure
- Does not recognise that HGVs and in particular the large heavier ones are far more damaging to road infrastructure than cars. Because of their weight, the standard 16.5 metre 44 tonne HGV, which is the industry workhorse, is 136,000 times more damaging to road infrastructure than a Ford Focus.[7]

So, instead of the report's claim that HGVs pay three times more in direct taxation than their estimated damage costs to infrastructure, HGVs are in fact only paying of their m reality HGVs are only paying £0.34billion (11 per cent) toward infrastructure costs against the FTA road cost estimate (corrected) of £3billion.

[7] This is called the ***Generalized Fourth Power Law***.

We recommend reform of the HGV and rail freight charging systems to remove the disparity between HGVs and rail freight
Rail and road complement each other, and the two modes should be able to play to their strengths. For example, rail freight is well placed for long distance consumer and traditional bulk traffic. But at the moment there is huge market distortion which makes it very difficult for rail to compete because, as the latest figures show, HGVs are only paying around a third of the costs they impose on the economy, society, and the environment. [8]

There is a need to calculate and consider all the external cost of HGV use
For articulated HGVs, the DfT produces "Mode Shift Benefit" (MSB) tables, most recently updated in 2015 with estimates for 2020 values at 2015 prices. These calculate the marginal costs so that investment in alternatives which reduce articulated vehicle miles can be tested for value for money.

These showed a rise in costs from the original 2009 estimates, those for road infrastructure and for carbon.

DfT marginal external cost tables

The tables below show the comparative values.

Table 1 Mode Shift Benefits 2015 and 2009
Pence per articulated HGV mile

	Motorways (by level of congestion)		**Roads**			
	High	**Low**	**A**	**Other**	**Weighted Average 2015**	**Weighted Average 2009 report**
Congestion	99	24	72	78	**57**	***52.4***
Accidents	0.5	0.5	5.6	5.5	**2.7**	***2.8***
Noise	9	7	8	14	**8**	***7.0***
Pollution	0	0	0.1	0.2	**0.1**	***2.5***
Greenhouse Gases	6	6	7	9	**7**	***3.8***
Infrastructure	7	7	24	171	**18**	***9.0***
Other (roads)[9]	6	6	6	6	**6**	***6.4***
Gross Total	127.5	50.5	122.7	283.7	**98.8**	***83.9***
Taxation	-31	-31	-32	-40	**-32**	***-34.1***

[8] Freight on Rail / Campaign for Better Transport response to Department for Transport call for evidence: reforming the HGV road user levy January 2018
[9] These include a range of effects including for the MSB report: up and downstream processes; soil and Water Pollution; nature and Landscape; driver frustration / stress; fear of accidents; community severance (including restrictions on cycling and walking); visual intrusion

Marginal cost gap	96.5	19.5	90.7	243.7	**66.8**	***49.8***
Road Tax as per cent Gross marginal cost	24 per cent	61 per cent	26 per cent	14 per cent	**32 per cent**	**41 per cent**

Sources: Mode Shift Benefit Technical Report, DfT 2009, Mode Shift Benefit Refresh, DfT 2015

It is clear from the above that a very significant amount of the real marginal costs of the largest HGVs is not being met. In 2016, 9 billion vehicle miles were run by articulated HGVs, implying a marginal cost shortfall of about £6billion. Clearly these numbers vary a little from year to year according to traffic and the severity of impacts such as pollution or casualties. However they remain substantial and completely unmet. The issue of congestion costs is discussed fully in the original report, they must be included in the marginal cost model if economic efficiency is to be maximised. [10]

Any road charging system must apply to both UK and foreign vehicles to ensure that all pay for the costs that they are causing on the UK road network. This will have the benefit of increasing revenue paid to the UK government and ensuring that all actors in the road haulage market are on a level playing field. However foreign hauliers still frequently purchase their fuel before travelling to the UK and therefore don't pay fuel duty in the UK.

Distance-based HGV charging could transform freight transport
The single most effective change to achieve all the Government's stated objectives of improving efficiency, reducing exposure to collisions, and reducing air and CO2 pollution would be to replace the existing time-based lorry charging system with a distance-based system which could relate charges paid to the real impacts HGVs have on other road users and the road network. The current daily charge bears no direct relationship to the amount of use of the network therefore the system does not incentivise more efficient use of the road network or the time at which it is used, to reduce lorry miles.
Furthermore, the revenues from the distance-based charging could be re-cycled into supporting the quality of logistics through training and technology which will help the viability and operations of SMEs, as seen in Germany.

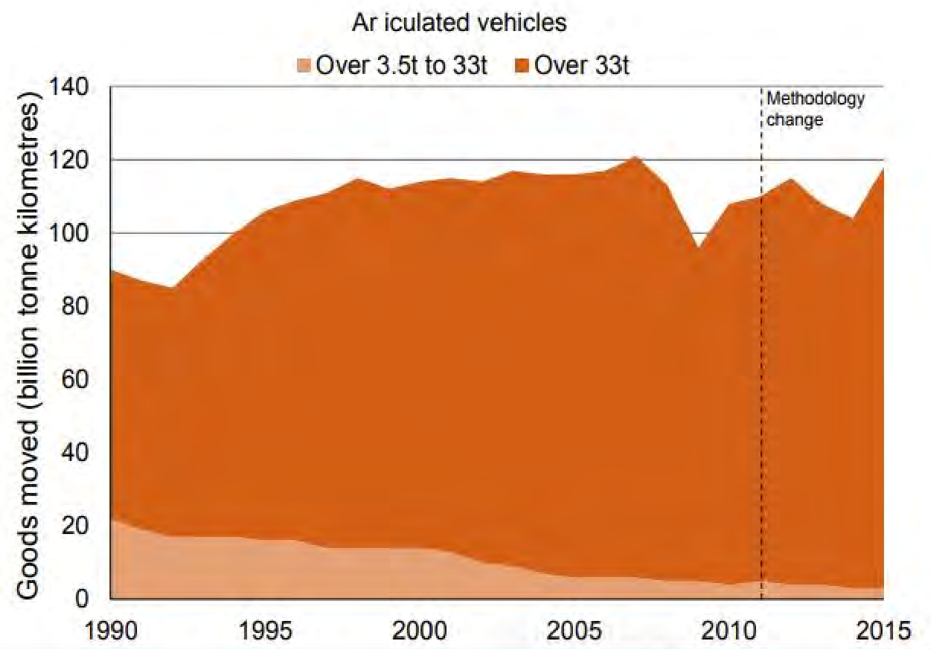
Dispelling the myths about the benefits of ever larger heavier lorries

The road haulage industry has an insatiable appetite for ever bigger lorries which saves them money but increases the external costs for economy, environment, and society. The point therefore is that bigger trucks might be efficient for road hauliers but that is because they are not paying for their external costs. The proponents say that larger trucks will reduce lorry miles and thus pollution but fail to explain why existing HGVs do not get good load utilisation.

The DfT latest domestic road freight statistics report and its statistics confirm this behaviour and states that, there has been a shift towards using larger HGVs with the tendency for the clear majority of HGVs to be purchased at the maximum size and weight permitted which optimises the position for the largest and heaviest loads but creates part loading for other consignments.

Therefore HGVs need to pay charges applicable to their size which is proportionate to their external impacts to incentive better use, contrary to arguments made for successive weight and length increases not borne out by reality.

[10] Freight on Rail: January 2018
http://www.freightonrail.org.uk/PDF/MTRU_addendum_to_the_2014_research_issued_in_Jan_2018.docx



Goods moved by GB-registered HGVs, by type and weight of vehicle, 1990-2015 [DfT Table RFS0107]

We are not persuaded by the DfT trial of 7ft longer semi-trailers. For example the longer semi-trailers being trialled by DfT, which have dangerous tail swings, are only fully loaded for a third of their journeys: the extra length is not being used at all for around half of their journeys and that is in the best trial conditions. [11]

Strategic Rail Freight Terminals can facilitate big growth in rail freight volumes

Rail/Road transfer terminals are key to improving freight efficiency as they allow both modes to play to their strengths and lets rail freight compete through economic of scales.

Joint analysis by Campaign for Better Transport and Malcolms, the operator of the Daventry rail freight terminal, shows that its Intermodal Rail Freight Terminal removed 64 million miles of lorry journeys from UK roads in the last year alone. Strategic Rail Freight Interchanges like Daventry are important economic generators and show the way the private sector is investing in and supporting rail freight. Rail Freight Interchanges enable rail to compete with HGVs by reducing the transhipment costs. Daventry Intermodal Rail Freight Terminal employs over 5000 people and is forecast to employ up to 9000 when its new terminal opens. [12]

Terminals of all sizes and scaled for different commodities are key. For example, in London and other cities, more aggregates terminals are needed to bring in construction materials into the heart of cities.

1.2 Which are the key freight corridors that matter the most? What are the bottlenecks in the freight network and what investment in upgrades could deliver the best value for money for freight efficiency and UK PLC?

Freight bottlenecks tend to be in the same places for both road and rail. Significant freight corridors include the A14, A34, M6, M1, as well as the Channel Ports to London, and the Trans-Pennine routes including the M62.

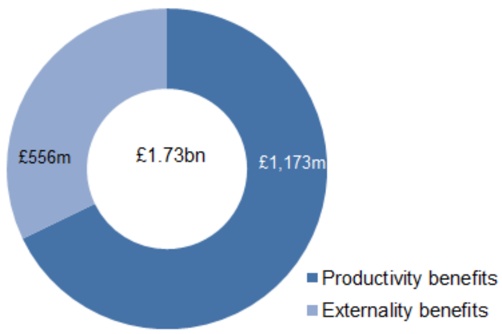
[11] Freight on Rail: Report claiming benefits of longer lorries is flawed, say campaigners (September 2017)
[12] Freight on Rail: New figures show rail freight is far better at reducing congestion than previously thought. (May 2017)

Congestion costs the UK £30 billion in 2016 with the UK ranked the fourth most congested developed country and third most congested in Europe.[13]
We cannot build our way out of road congestion, and therefore need mechanisms to control demand. Building more roads alone will not solve the problems as it creates new traffic. When a new road is built, new traffic will divert onto it, a well-known and long-established effect 'induced traffic'.[14]
Making more efficient use by lorries of existing roads, incentivised by distance-based charging, is part of the answer not only to the future challenges of freight movement but also to wider problems of congestion and pollution.
A sustainable freight strategy will combine distance-based road charging with a significant shift of freight from road to rail.

1.3 To what extend are the economic benefits of freight factored into wider transport infrastructure investment planning?
The fact that the benefit Cost Ratios for freight enhancements are very strong, typically in the range of 4:1 to 8:1, should be factored into investment planning. For example, Southampton gauge upgrades increasing market share from 29 to 36% within a year, with excellent cost-benefit ratio with 5:1 cost-benefit ratio.

The economic benefits of rail freight

KPMG estimates that for the calendar year 2016 rail freight delivered economic benefits totalling £1.7bn per year[15]. This includes productivity gains for British businesses of around £1.17bn and congestion and environmental benefits of over £556m. If appropriate policies were put in place to encourage increased modal share of the movement of freight by rail using tools such as HGV charging these benefits would be further increased.



Improving competitiveness and delivery productivity

Efficiency gains and reduction in transport costs to customers have resulted in rail freight making a substantial contribution to the productivity of UK Plc by reducing the cost of transporting goods for Britain's businesses and providing a high-quality level of service. Since 1994 volumes have grown by 33%, whilst the turnover of the sector was broadly similar in 2017 to that of the mid-1990s in nominal terms.

The savings have largely been passed on to customers, resulting in improvements in the competitiveness of Britain's businesses. As a result it would cost rail freight customers nearly £1.2 billion extra a year to transport the goods currently carried by rail by road instead. These are the productivity benefits for UK plc.

[13] INRIX: Global Traffic Scorecard
[14] CPRE: The end of the road? Challenging the road-building consensus (March 2017)

[15] Rail freight in GB – productivity and other economic benefits, KPMG, 2018

1.4 What are the regulatory and legal issues that, if changed, could improve freight efficiency without increasing costs or reducing efficiency?
The full extent of freight costs should be properly evaluated**.** Rail freight's socio-economic benefits should be given greater weight in infrastructure investment decisions.

High external costs in the road haulage industry, caused by poor regulation where low quality operators undercut the professional operators should be remedied. Therefore, the Government needs to ensure and pay for proper enforcement of existing regulations. FTA figures show that HGV roadside encounter prohibition mechanical rates were 30 per cent and weight violations were 45.5% in 2015 for UK drivers.

2. How might the demand for freight develop and change over the next 20-30 years?
We refer the NIC to the responses from individual operators, while noting the inherent uncertainty given the potential impacts of new technology; urbanisation; impact of policy changes such as Clean Air Zones; and economic changes post-Brexit. We encourage the NIC to explore a range of scenarios, including those where traffic demand falls as well as growth scenarios.

2.2 How has the demand for freight, and types of freight, changed over the last two decades, and what will be the drivers for changes in the future?
Imports of consumer products from the Far East have resulted in consistent increased demand for freight services from the key container ports such as Felixstowe and Southampton. Rail freight volumes in this sector have increased 10 per cent since 2013/4 now accounting for 40 per cent of the rail traffic. This is a key growth market for rail freight with considerable suppressed demand because of the lack of rail capacity. Customers want just in time service rather than holding large stocks. The latest change has been the demand for next day deliveries which is now been accelerated to same day delivery requests which is having a serious impact on congestion and the freight industry's ability to consolidate.
Coal traffic, which until 2012, accounted for a third of rail freight traffic, has declined steeply with an 82% reduction since 2013/4, now accounting for 8 per cent of traffic.

Infrastructure and housing expansion
There has been a dramatic increase in rail freight traffic in this sector, which has seen record growth in the past quarter and now accounts for 25 per cent of traffic, having grown almost 20 per cent since 2013/4.
Rail can play an increasingly important role in this sector for both housing and infrastructure. Each freight train can carry enough materials to build 30 houses. Already rail is bringing up almost half of the aggregates into London and brought in the materials for Crossrail and removed the spoil.
The NIC should stipulate that using rail for delivery of materials for large infrastructure projects to railheads should be a planning condition.

Internet shopping and the service economy
There has been a huge growth in freight from the growth of online shopping and the wider service economy, for example with the increased home and businesses' use of technology requiring servicing. Research on this has been sparse. There is an argument that the creation of several rival distribution networks, especially for parcel traffic, is inefficient and imposes externalities. It is unclear where future trends are going - for example 3D printing could radically change freight demand again. For more discussion of this, see http://www.bettertransport.org.uk/sites/default/files/pdfs/Tracks-Carbon-Reduction-Report-2017.pdf.

2.2 How is the freight industry planning for future changes in the demand? What levers might be available to shape future demand for freight transport
Levers available include the potential move to distance-based lorry charging. Currently, the industry is competitive but not efficient. The existing time-based system has neither led to efficiencies, nor reduction in emissions and collisions in the UK. Empty running is now at 30 per cent the highest level for years and load utilisation has not improved either.
With a direct relationship between the taxes per km travelled and the marginal costs which a distance-based charging system can provide, we anticipate greater operating efficiencies.

3. What effects does congestion have on the efficiency of freight movement and emissions?

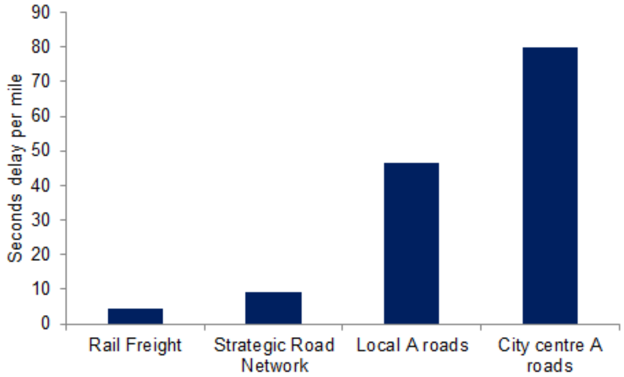
3.1 How does congestion impact upon the productivity and economic contribution of freight? To what extent does congestion affect changes to mode, time and other freight choices?

Road operations must build in extra time to meet strict delivery slots at supermarkets for example, because of the unreliability of the road network.
Congestion on roads means that travelling takes much longer and journey times are less predictable. The Department for Transport now estimates that congestion costs the UK economy around £4 billion per year[16]. But Inrix puts a far higher cost on it. Congestion costs the UK £30 billion in 2016 with the UK ranked the fourth most congested developed country and third most congested in Europe. [17]
We urge the Department to consider the role of rail freight in tackling congestion. The consultation on the HGV road use levy does not consider the ability of rail freight to ease congestion on the road network. For example, on the A34 route between Southampton and the West Midlands, one of the most congested roads in the country, with a poor accident record[18], increasing the rail mode share from 35% to 50% would result in two thousand lorry loads a day shifting to rail, the equivalent of taking eight thousand cars off the road[19].

The ability for rail to dramatically reduce road congestion on some of the country's busiest roads is important. It highlights the need to holistically consider different modal interventions on a corridor-by-corridor basis when evaluating options to reduce congestion. Cross-modal assessments will help understand the interventions that offer best value for money and are consistent with Government's strategic objectives. Congestion is rightly identified as one of the UK's greatest challenges. It blights most of our cities and major urban areas where unplanned congestion causes delays to journeys. The increase in unplanned delays and corresponding increase in journey times makes our cities less attractive and our businesses less productive/competitive.

While unplanned delays, because of congestion, have a significant impact on the road network, this is a much smaller issue on the rail network. The following chart compares unplanned delays on the road network, including city centre 'A' roads, the Strategic Road Network, and the national average, against unplanned delays of rail freight.

Table: Reliability of road and rail freight



While unplanned delays affect both modes, rail continues to be a far more reliable mode than road. Average delay on the Strategic Road Network is now estimated to be 9.0 seconds per vehicle per mile[20], 46 seconds

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[16] Road works: The future of lane rental, Department for Transport, 2017
[17] INRIX: Global Traffic Scorecard
[18] https://hansard.parliament.uk/Commons/2016-10-26/debates/F0B582CB-C642-4090-95F5-7B9972350634/A34Safety
[19] Impact on congestion of transfer of freight from road to rail on key strategic corridors, MTRU, March 2017 (http://www.bettertransport.org.uk/sites/default/files/research-files/cross-modal-freight-study.pdf)
[20] Travel time measures for the Strategic Road Network, England: 2016, Department for Transport, 2017

nationally and 80 seconds per mile on ‘A’ roads in city centres. Conversely only 4.4 seconds of delay per mile were caused on average nationally to freight trains in the year ending March 2017[21].
A key difference between the modes is that unlike road, rail freight is planned and timetabled with the assumption of no delay. This fundamentally makes rail a much more reliable mode and, provides greater certainty, enabling customers to plan their logistics chain with greater efficiency.
Logistics operators would use more rail freight services as a more reliable alternative to HGVs if the rail freight network was enhanced because of road congestion affecting reliability

3.1 How does congestion affect the environmental impacts of the movement of freight.

3.3 With limited space for new infrastructure, how can we better use our existing urban networks to support freight? Are there changes – such as changes to modes, methods or delivery times – that could help reduce the stress on the urban transport network?
City and sub-national authorities are recognising that the existing patterns of urban freight delivery are not sustainable because of the need to reduce carbon, air pollution, road congestion and the need to make safer cycling provision.
One answer is to increase the volume of construction materials transported by rail into cities. Almost 50 per cent of aggregates are transported by rail into the capital. More rail freight terminals, such as that recently approved at Cricklewood in Brent, are needed to cater for housing growth in cities across the UK.Another answer is the use of rail connected consolidation centres/terminals on the edge of conurbations which freight can be transhipped into low emissions vehicles including electric cargo bikes for light goods.

Rail can fulfil the long-distance trunk haulage to the consolidation centres. Another model is to use passenger terminuses at night to bring in trainloads of freight into the heart of cities, when the passenger elements of the station are closed. Two successful trials were carried out into Euston at night with Colas Rail delivering full train loads for Sainsburys and TNT respectively for transhipment into low emissions vehicles.

These policies are supported by the report *Delivering the Future- new approaches to freight* from the Urban Transport Group, formerly PTEG**,** which calls for smart logistics and highlights the essential role of urban freight in ensuring the effective functioning of the UK economy and presents a fresh vision designed to safeguard this role as well as protect the environment and quality of life for communities. This builds on earlier PTEG commissioned research, *Freight in the City Regions 2013*.
It envisages that every opportunity should be taken for freight to make its way to urban areas by rail or water, either directly into those areas, or into the major distribution parks that serve them. It argues that those distribution sites should be located so that it is practical for goods to travel the last mile(s) into urban centres using zero/low emission modes. These last mile journeys should be achieved as safely, unobtrusively and with as little environmental impact as possible.
The report explores several ideas that could assist in achieving this vision and calls for a broader, nationwide freight strategy to provide direction and leadership to the industry and its stakeholders.

Vans are lacking in regulation and consolidation
We also refer the NIC to the important research on freight produced by the European NGO Transport and Environment (T&E). T&E report that vans are responsible for 12% of the EU’s total road transport emissions. The current 147 g/km CO2 standard for vans in 2020 is dismally unambitious compared to the 95 g/km target for cars. A target of 113 gCO2/km should have been set for 2020 to require the equivalent cost-effective gains in fuel efficiency. As a result, improvements in van efficiency have been minimal, increasing operational costs for users. [22]

[21] Average delay on local ‘A’ roads: monthly and annual averages, Table CGN0502, 2017
[22] Transport & Environment: Small electric vans cost the same as dirty diesel ones today but are in short supply 15 February 2018

One of the unforeseen consequences of charging is a migration away from the smaller HGVs to vans. Therefore there is also a strong case for extending the scope of the levy to vans that are used for the professional carriage of freight as such vehicles are being used to avoid laws that are applicable to trucks.

There is also poor consolidation in van traffic and flight from the lower tonnage HGVs to big vans. This is explored further in forthcoming research to be published by Campaign for Better Transport on air pollution and transport ("Time to clear the Air?") which includes a section on light duty vans. We will share this with the NIC on publication.

4.How can freight lower its carbon and air quality impacts?
Both CO2 and air quality impacts can be addressed by transferring more freight to rail. Road freight is a big CO2 emitter, as HGVs contribute 17 per cent of surface access CO2 emissions, despite making up only 5 per cent of road vehicles. [23]
Reducing emissions from road freight is expected to be challenging, confirmed in a report from AECOM: "*it will be very difficult to meet the 2050 goals without major reductions in GHG emissions from Heavy Goods Vehicles (HGVs).* [24]

Furthermore, *w*hile electric technology means car and van emissions can be reduced significantly, the DfT has stated that it expects the existing HGV diesel engine technology to be predominant well into the next decade in its carbon review in February.

Emissions from HGVs constitute at least 16 per cent of carbon emissions from transport, and as reported in recent research for Campaign for Better Transport, the introduction of Euro V standards in 2008 and Euro VI standards in 2013/14 in fact saw a very slight increase in carbon dioxide emissions per kilometre due to engine modifications to improve air quality. The replacement of older vehicles with the latest Euro VI HGVs is therefore unlikely to reduce fuel use by a significant amount. [25]

Air quality
Upgrading HGVs to Euro VI engines can have a marked impact on air pollution. While the latest trucks with Euro VI engines represent a significant tightening of permissible emissions with particulate matter halved and NOx emission reduced by more than three quarters compared to 2009's Euro V standards, the average HGV is seven and a half years old meaning only a quarter of lorries on the road meet Euro V standards and even fewer trucks meeting Euro VI standards.

The majority fall into the Euro IV and V brackets while 14 per cent of HGVs are over 13 years old. These older lorries are required to meet only Euro III standards or earlier which permit NOx emissions between 13 and 20 times higher than Euro VI and particulate emissions between 13 and 60 times higher source.

Reductions in vehicle kms as a result of efficiency would reduce emissions and improve air quality. The German distance-based charging system supports the purchase of cleaner trucks, especially for SMEs, of Euro V & VI, with the result that between 2005-2009 the proportion of Euro V and IV in the fleet rose from 2 to 62 per cent.

HGVs account for around 21 per cent of road transport NOx emissions while making up just 5 per cent of vehicle miles. [26] Any incentive to reduce HGV miles, such as a distance-based levy, will therefore make a positive contribution to improving air quality.

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[23] DfT Freight Carbon Review (February 20017)
[24] AECOM report ECO driving for HGVs (December 2016)
[25] Campaign for Better Transport: Tracks report, Environmental quality climate change and transport innovation December 2017
[26] DfT Freight Carbon Review (February 2017)

A shift to rail freight will play an important long-term role in reducing non-exhaust particulates (PMs). While the latest Euro VI engine technology reduces exhaust particulates, non-exhaust particulate pollution from HGV tyres and brakes, which is hard to reduce for trucks, will remain a serious problem for which there is no current solution, especially for trucks which have large tyres.

4.1. Are there efficiencies within freight management and distribution practices that could help reduce the CO2 and NOx emissions from freight?

See Page 5 of this response – We recommend reform of the HGV and rail freight charging systems to remove the disparity between HGVs and rail freight

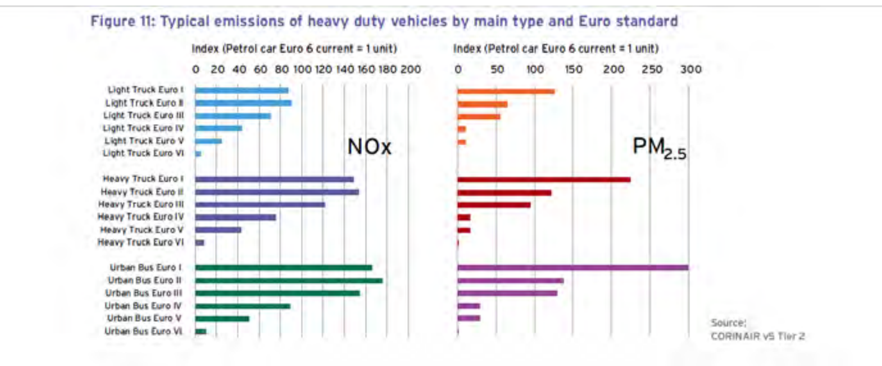
Distance based charging could bring about a significant reduction in lorry miles [27]. There is detailed discussion on efficiencies in the report already cited.
http://www.bettertransport.org.uk/sites/default/files/pdfs/Tracks-Carbon-Reduction-Report-2017.pdf

Especially in chapter 9 Page 49 Carbon emissions from HGVs

This is also discussed in forthcoming research which is due out imminently
Air pollution and transport Time to clear the Air? Page 38 Heavy duty vehicles
Go to www.bettertransport.org.uk

A table from this report is below

Typical emissions of Heavy good vehicles by main type and euro standard P34 from CBT report above



End tax loophole on refrigerated lorry units.

Campaign for Better Transport urges the Government to end a “tax loophole” which allows refrigerated lorries to use cheaper ‘red diesel’, other fleet operators use it to run unregulated secondary engines which power their refrigeration units.

Continuing to charge less for the fuel for these units will undermine efforts to clean up cities’ air quality by removing any incentive to move to cleaner fuel types. By hardly taxing diesel used for refrigeration units the Government is providing a perverse incentive for supermarkets and other companies to carry on using diesel, when instead they should be adopting alternative cleaner technologies. The current tax arrangements actually encourage the use of diesel refrigeration engines continuing to exist on supermarket lorries. Transport refrigeration units emit up to 93 times more NOx and 165 times more PM than the standards Euro 6 diesel car.

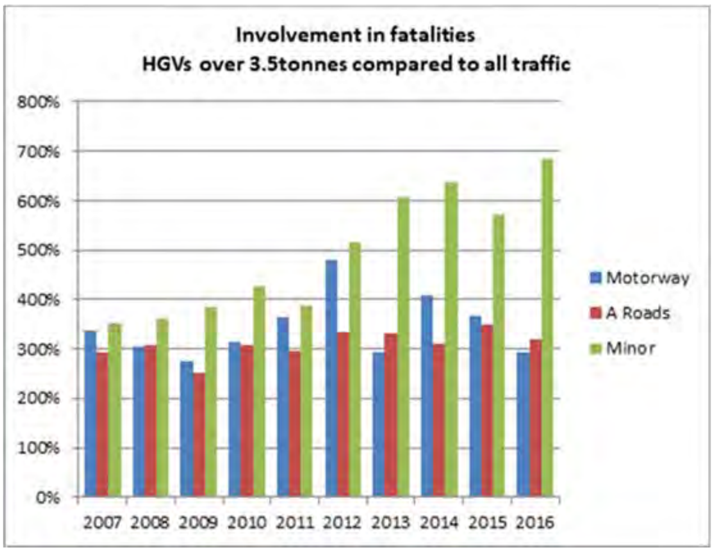
[27] Freight on Rail / Campaign for Better Transport response to Department for Transport call for evidence: reforming the HGV road user levy

4.2 What role do alternative fuels such as electricity, liquid petroleum gas and biofuels have to play?
The Government needs to do research for alternative fuels for rail in the way that it does the OLEV research for HGVs.This is again covered in forthcoming research which is due out imminently and will be emailed to NIC on publication. Air pollution and transport Time to clear the Air? P41 the Impact of alternative fuels.

4.3 What technologies could best and most realistically be utilised to manage the carbon impacts of freight, both within urban areas and on longer strategic journeys?
The use of electric vans, which are no more expensive than diesel ones and electric cargo bikes for light goods should be encouraged in urban settings.

Electrification of rail network
Further electrification of the rail network would help the Government meet its sustainability targets and in particular reduce air pollution. It would encourage more use of electric traction by the rail freight industry as long as there are diversionary routes. Locomotives have a long longer life cycle of around 30 years whereas HGVs are around 5 years, so the industry has to make long-term investment decision based on Government policy at the time. Electric traction is tried and tested, it reduces maintenance costs and increases capacity. The Government should carry out research into alternative fuels for rail as it is doing for road.

The safety costs of freight should be evaluated and taken into account
Safety benefits of rail freight should be considered. HGV involvement rate in fatal crashes on local roads has doubled in the past ten years.
Our ten-year analysis of DfT Road Safety statistics, which show that HGVs are now twice as likely to be involved in a fatal collision on minor roads as they were ten years ago, demonstrates the benefits of reducing lorry miles. Despite only making up five per cent of overall traffic miles, HGVs are almost seven times more likely than cars to be involved in fatal collisions on minor roads.
Whilst cars are getting safer, HGVs continue to be dangerous in a collision because of their size and weight. The figures also reveal little or no improvement in the rates of fatal collisions involving HGVs on motorways and A roads. In 2014, on motorways, HGVs were involved in almost half (45 per cent) of fatal collisions although they only accounted for 11.6 per cent of the miles driven on them.



Source: *Traffic statistics table TRA0104, Accident statistics Table RAS 30017, both DfT*

The following DfT table shows the benefits of preventing collisions

Valuation of the benefits of prevention of accidents

Table 1 presents the average values of prevention of road accidents and casualties by severity based on 2011 prices and values. Table 2 presents the average value of prevention of injury accidents by road type (2011 prices).

RAS60001: Average value of prevention per reported road accident casualty and per reported road accident: GB 2011

£ June 2011

Accident/casualty type	Cost per casualty	Cost per accident
Fatal	1,686,532	1,877,583
Serious	189,519	216,203
Slight	14,611	23,136
Average for all severities	50,024	71,885
Damage only	-	2,027

5 **How could new technology be utilised to increase the efficiency and productivity of UK freight?**

5.1 How will new technologies change the capacity and performance of the freight transport network? Over what timeframe might these new technologies begin to affect the freight transport network?

5.3 How do you see technology such as HGV platooning, digital railway signalling and autonomous vehicles being integrated into freight distribution?

The NIC should not be pinning its hopes on lorry platooning, (Ref NIC Interim report: Congestion, Carbon Priorities for National Infrastructure) which is in its infancy for dense road networks like the UK, whereas rail freight is already removing large numbers of HGVs from key transport corridors each day. The NIC Interim report proposal of removing freight from the railways to platooning HGVs would have significant adverse economic, environmental and safety impacts as explained throughout this response.

Lorry platooning with driverless rear trucks could unquestionably reduce road haulage costs, but presents serious road safety risks, especially in bad weather, on our congested road network as highlighted by motoring groups. While the proponents state that the rear lorries will have drivers now, the longer-term aim, given that the technology is expensive, must be to run without rear drivers as their wages make up around a third of the traditional HGV running costs. It could also make it harder for independent hauliers, who still make up a large element of the sector, to compete with the big logistics providersi. That is why there has been mixed reaction for the measure from hauliers and their representative bodies. Platooning could help the industry overcome its shortage of drivers, though.

While platooning could be viable in sparsely populated countries, there are serious safety and practical obstacles, such as cyber-crime, in allowing a procession of lorries on our congested motorway network which has frequent exits close together. Other outstanding issues include where these conveys will assemble and how they will work with so-called smart motorways, without hard shoulders for emergencies. Hauliers have raised concerns about how trucks with different sized engines and varying weights of loads will work together in a convoy.

Platooning, which is expected to reduce pollution by around 10 per cent, could seriously undermine rail freight which reduces congestion, is far safer and produces 76% less carbon dioxide emissions and up to fifteen times less NOx and 90% less particulates than trucks.

Platooning could also increase road damage costs; the standard truck is 138,000 times more damaging to road infrastructure than a Ford Focus. Additionally, driverless lorries are likely to need higher quality and more uniform road infrastructure and markings.[28]

6 Are there good example internationally of freight systems, policy, infrastructure or technology developments and implementation that the UK Can learn from to increase freight efficiency and or reduce the carbon and congestion impacts?

We commend the lessons of European distance-based HGV charging systems from German, Austrian and Swiss distance-based HGV charging, as reported in Freight on Rail response to Department for Transport call for evidence: reforming the HGV road user levy (January 2018). Or at this link http://www.freightonrail.org.uk/PDF/European_distance_based_charging_case_studies.docx

[Name redacted], [Job title redacted],
Campaign for Better Transport

Campaign for Better Transport's vision is a country where communities have affordable transport that improves quality of life and protects the environment. Achieving our vision requires substantial changes to UK transport policy which we aim to achieve by providing well-researched, practical solutions that gain support from both decision-makers and the public.

16 Waterside, 44-48 Wharf Road, London N1 7UX
Registered Charity 1101929. Company limited by guarantee, registered in England and Wales: 4943428

[28] Campaign for Better Transport: Rail freight better way to cut congestion and pollution than lorry platooning (August 2017)

Progressive Energy Response to the NIC Freight Study Call for Evidence March 2018

Background to Progressive Energy

Progressive Energy is an established independent UK clean energy company focusing on deployment of emergent technologies and associated project development and implementation. It has particular expertise with regard to production of biomethane and hydrogen from waste feedstocks. It has pursued Carbon Capture and Storage since 1998 with an international reputation in the sector in particular associated with capture from industrial processes and activities relating to decarbonised hydrogen production. It also provides advisory services, in particular providing expert due diligence to a range of investors considering investments in new low carbon and renewable technologies. It undertakes advisory work for policymakers and is a founding member and on the industrial advisory board for the EPSRC Supergen Bioenergy Hub.

In 2010 it undertook a feasibility study with CNG Services for National Grid, Centrica and the North East Process Industry Cluster (NEPIC) into the production of Bio- Substitute Natural Gas (BioSNG) for heat and transport, by thermal and chemical processing. This approach produces fungible natural gas fuel, but uses a wide range of feedstocks including residual mixed waste, enabling production of significantly greater quantities of gas in the UK.

Since 2012 it has worked in consortium with Cadent and Advanced Plasma Power to deliver initially a pilot plant funded through BESTF and OFGEM's Network Innovation Competition (NIC). The consortium is now delivering the world's first full-chain, waste-fuelled BioSNG plant, taking residual waste input and producing contracted renewable gas output. This is funded by both Department for Transport (under the Advanced Biofuels Competition) and NIC. This facility will be operational in 2018 and produce 22 Giga-Watthours of gas per annum. The facility will deliver gas both to a haulage company with an existing Compressed Natural Gas (CNG) fuelling station, to convert their HGV fleet to renewable gas, and to the local gas grid for heat consumers. Further information about these projects can be found at http://gogreengas.com/

In the following, we have responded to questions: 4.2, 4.3, 5.4 & 6.

4.2 What role do alternative fuels such as electricity, Liquid Petroleum Gas and biofuels have to play? What are the barriers and challenges to wide-scale uptake of alternatives to diesel and what could be done to help remove these issues?

Emissions from HGVs represent 18% of UK road transport emissions, and 4% of total UK emissions[1]. HGVs also contribute 21% of all UK NOx emissions. Reducing emissions from HGVs therefore has the potential to make a significant contribution to UK efforts to reduce greenhouse gas emissions.

[1] "Final UK greenhouse gas emissions national statistics 1990-2016", BEIS, 2016

The potential of electricity and biofuels (in the form of biomethane and bio-derived hydrogen) to achieve this is considered below.

Electricity

Electric vehicles have zero tailpipe emissions, which is clearly beneficial for air quality.

The greenhouse gas savings associated with electric vehicles are dictated by the emissions associated with generating the power used to charge vehicles, and with manufacturing vehicle batteries. Although some GHG savings are available today, significant savings depend on decarbonising both the UK grid and battery production.

There are no currently-available electric HGVs, although Cummins and Tesla have both promised to deliver such vehicles in 2019. Such trucks will have lower haulage capacity than diesel or gas-fuelled alternatives due to the mass of the batteries required to achieve acceptable range; this is likely to have a significant impact on their profitability.

While electric vehicles are well-suited to transport of smaller quantities of goods over short distances, they cannot in the short term decarbonise the HGV fleet.

Biomethane

Potential

LowCVP[2] investigated the benefits of gas-fuelled HGVs compared to diesel-fuelled HGVs. Their research found that, compared to the newest Euro-VI diesel HGVs, gas-powered equivalents reduce total NOx emissions by 41% and particulate emissions by 96%. It is also accepted that gas vehicles are approximately 50% quieter.

Element Energy assessed the well-to-wheel greenhouse gas emissions of gas vehicles in a 2017 study[3]. The graph below summarises the results of the study, which showed that a single biomethane HGV will save more than 120 tonnes of CO_2eq each year, and that vehicles running on natural gas also deliver carbon savings. The savings are increased by intelligent infrastructure planning, such as placing filling stations on the LTS rather than the MP network.

[2] "Emissions Testing of Gas-Powered Commercial Vehicles", LowCVP, 2017

[3] "Independent assessment of the benefits of supplying gas for road transport from the Local Transmission System, for Cadent Gas", Element Energy, 2017

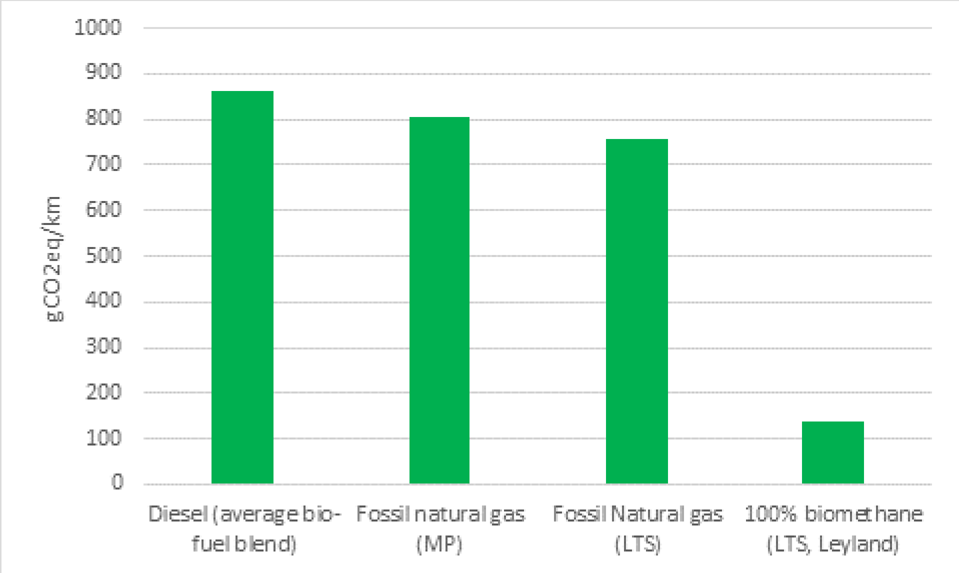


Figure 1: Well-to-wheel emissions associated with various HGV fuels

Gas-fuelled vehicles therefore offer benefits in each key area: NOx, particulates and GHG. Future sources of biomethane such as BioSNG hold the potential to greatly increase the benefits, even enabling strongly negative emissions; whether delivered as CNG or LNG, gas is beneficial.

In order to be worth pursuing, biomethane must hold the potential to make a significant contribution to HGV fuel. A 2017 E4tech/Anthesis study commissioned by Cadent[4] assessed the potential future production of renewable gas at 108TWh; total HGV fuel consumption in 2015 was 6.23 million tonnes[5], which equates to 79TWh. Buses consumed an additional 15TW; there is sufficient biomethane potential to decarbonise both sectors.

Barriers

Three things must be in place to enable widespread deployment of biomethane:

1) Availability of fuel
2) Availability of vehicles
3) Availability of refuelling infrastructure

Progress in each of these areas has been made in the last few years, with operators such as Howard Tenens and Waitrose running significant gas-fuelled fleets, and CNG Fuels developing a pipeline of filling stations. However, future growth depends on stakeholders having confidence that there will be a commercial case for production and use of biomethane for transport well into the future.

A key pillar of the commercial case is the fuel duty differential between gas and diesel. A strong commitment to maintaining this beyond 2024 will provide confidence that allows operators to invest in

[4] "Review of Bioenergy Potential", E4Tech and Anthesis for Cadent Gas, 2017

[5] Table 2.02 of "Energy Consumption in the UK, 2017 Update", BEIS, 2017

gas-fuelled trucks, creating the market that biomethane producers need in order to access RTFO support and invest in production facilities. Deployment must be underpinned by refuelling infrastructure; Government should consider how to make filling stations easier to consent.

It is worth bearing in mind that promoting biomethane for HGVs does not tie the UK into that approach long-term. High-mileage HGVs are typically replaced every 5-7 years, and if technologies such as electric- or hydrogen-fuelled HGVs become available, a transition can be made. Establishing confidence in gas-based fuel and growing the market for on-vehicle gas storage would represent a valuable stepping stone towards hydrogen use. Another legacy of this would be large scale production of biomethane that can be used in other hard-to-decarbonise sectors of the economy, such as heat.

Biomethane in HGVs delivers reductions in NOx, particulates, noise and CO_2, and can be deployed now.

Hydrogen

<u>Potential</u>

Hydrogen fuel cell vehicles combine many of the advantages of electric and gas vehicles given above. Like electric vehicles, they produce zero emissions at the point of use. Like gas vehicles, they can be refuelled rapidly and can carry large loads long distances. Clean hydrogen can be produced from the same feedstocks as biomethane, from electricity or from fossil fuels with Carbon Capture and Storage, and there is therefore ample potential future supply to fuel the UK's HGV fleet.

<u>Barriers</u>

Like biomethane, successful deployment of hydrogen-fuelled transport depends on the availability of hydrogen generation, infrastructure and vehicles.

Hydrogen vehicles are under development, and much of the necessary technology will be proven by successful demonstration of hydrogen fuel cell buses in the Jive 2 project[6]. However, there is presently very little hydrogen generation, and limited distribution infrastructure. Biomethane deployment can make use of existing fossil gas networks, but in the short-term, hydrogen does not have this advantage.

Early hydrogen use in transport is very unlikely to be at sufficient volume to justify production and distribution networks. Early deployment must therefore take advantage of hydrogen network created in projects to provide hydrogen to industry and domestic users, such as Cadent's Liverpool-Manchester Hydrogen Cluster[7]. Supporting projects such as this is the best way to promote a future hydrogen supply that could be used in transport. It is important that, unlike the current form of the RTFO, support for clean hydrogen includes low-carbon hydrogen from fossil sources.

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[6] http://www.element-energy.co.uk/2018/01/commercialisation-of-fuel-cell-buses-moves-one-step-closer-with-the-launch-of-the-jive-2-project/

[7] "The Liverpool-Manchester Hydrogen Cluster: A Low Cost, Deliverable Project", Progressive Energy for Cadent Gas, 2017

4.3 - What technologies could best and most realistically be utilised to manage the carbon impacts of freight, both within urban areas and on longer strategic journeys?

Electricity, hydrogen and biomethane provide improvements over diesel in terms of particulates, NOx, and noise. Therefore all are suited to urban areas (although only hydrogen fuel cell and electric vehicles could operate in Zero Emission Zones).

For longer journeys, there is a clear advantage to biomethane and hydrogen, because of the longer range (500 miles), quick refuelling and the weight of batteries that electric HGVs would have to carry. Deployment of 50-100 biomethane refuelling stations would be sufficient to decarbonise the majority of HGV journeys.

5.4 - How might regulations and physical infrastructure need to adapt to new technologies and business models in the freight sector?

Regulations could assist with deployment of biomethane in the following ways:

- Confirmation of a long-term (beyond 2024, potentially to 2032 in line with the RTFO) duty differential between gas and diesel fuels would give confidence to fleet operators that the commercial case for gas vehicles will remain valid
- Policies to ease the consenting process for strategically-placed biomethane filling stations would speed up development of refuelling infrastructure that could serve the majority of the UK

Inclusion of BioSNG as a Development Fuel in the 2018 RTFO amendments has been a major step in securing future availability of biomethane.

Regulations could assist with hydrogen deployment in the following ways:

- Support should be given to development of hydrogen production and distribution projects focused on existing gas users, which can in future be used for transport
- Support for clean hydrogen should include low-carbon hydrogen from fossil sources (this is being considered for future amendments to the RTFO)

6 - Are there good examples internationally of freight systems, policy, infrastructure or technology development and implementation that the UK can learn from to increase freight efficiency and/or reduce the carbon and congestion impacts?

According to NGV global, there are currently around 24.5 million natural gas vehicles in the world, and more than 30,000 filling stations[8]. Cadent have prepared a summary of the policies that have driven expansion in the USA, EU and China, which is included in their response to this consultation and reproduced below. In line with our answer to Question 5.4 above, it is clear that a key factor has been

[8] http://www.iangv.org/current-ngv-stats/

encouraging the rollout of refuelling infrastructure, and that fuel tax differential has been effective at giving operators the confidence to add gas-fuelled vehicles to their fleets.

Cadent summary:

United States of America

- Policy: Fixing America's Surface Transportation Act
  - Encouraging building of CNG refuelling stations strategically across the USA from 2015.
  - Deployment targets for alternative fuels set by Department for Transport.
  - Sets maximum distance of 150km between CNG stations (1,741 built by 2017) and 200km between LNG stations (143 built by 2017) – in line with European Ten-T Core Network Directive. (NGV America, 2017)
- Fleet Operators including UPS, FedEx and Dillan Transport are increasing the share of alternatively fuelled vehicles in their fleets, encouraged by greater differential in taxes and levies of diesel and alternative fuels provided by the Alternative Fuel Excise Tax Credit.

European Union

- Gas Networks Ireland, who own and operate gas transmission and distribution infrastructure in the Republic of Ireland, have recently announced (Gas Networks Ireland, 2017) the Causeway Project, which provides for the construction of 14 gas refuelling stations (vision for 70 after 10 years) for vehicles, together with €20,000 grants for vehicle conversion. This project tackles barriers to market conversion away from diesel at both the infrastructure and fleet level, removing the "chicken and egg" scenario, which currently plagues the UK.

Causeway Project, *Gas Networks Ireland*, 2017

- In Germany, the development of the Natural Gas Vehicle market has also benefited strongly from this type of joined up approach. In Germany, fuel providers of gas have committed to building a defined number of refuelling stations with collaboratively agreed geographical coverage to avoid duplication, gas distribution companies have pushed market development and the government has committed to maintaining a fuel duty differential between diesel and natural gas.

China

- Air Quality issues, particularly in cities and short range intercity routes are driving a central government push to cleaner fuels.
    - A significant increase in stations has been seen (c.1,000 in 2008 up to 7,950 in 2016).

- Number of natural gas vehicles operating in China has grown from 6,000 in the year 2000 to 5 million in the year 2016 (Wang, 2016).
- 56% of new trucks produced in China are dedicated Gas vehicles (Wang, 2016).

TfWM Response: National Infrastructure Commission Freight Study: Call for Evidence 5/3/18

Further Information:
Emily Perry: [Email address redacted]

Question 1: What are the constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?

1.1. What do you see as the key drivers to a successful freight system that is fit for the future?

Transport for West Midlands (TfWM), the transport arm of the Mayoral West Midlands Combined Authority (WMCA), invest in improving the regional transport system, working towards delivering an integrated system and supporting a positive change in the lives of millions of people.

We are responsible for delivering the Mayor's Transport Action Plan, the WMCA's Transport Strategy and the WMCA Strategic Economic Plan ambitions.

The TfWM geography covers – Birmingham City Council, Coventry City Council, Dudley Metropolitan Borough Council, Sandwell Metropolitan Borough Council, Solihull Metropolitan Borough Council, Walsall Metropolitan Borough Council and the City of Wolverhampton Council.

TfWM also work closely with WMCA's non-constituent authorities, Local Enterprise Partnerships, and bodies such as Midlands Connect.

Freight and logistics are vital to our economic activity and development. They support people and businesses in their daily activities, ranging from deliveries to homes and shops through transferring goods to and from factories or getting supplies to offices.

The approved West Midlands Freight Strategy and Implementation plan helps to provide TfWM with the tools to work together with businesses, and a programme to deliver a West Midlands that shines as a beacon for best practice in urban logistics management, providing:

- Improved access to the West Midlands by road and rail;
- New ways of managing deliveries which provide businesses and residents with high quality access to goods and services;
- A range of techniques to reduce emissions, noise, and congestion caused by goods vehicles;
- Support for the introduction of very low emissions or zero emissions delivery systems; and
- Commitment to deliver these improvements through a partnership with businesses and government.

However, there are many challenges to the effective movement of freight. Issues such as poor air quality and wider congestion problems, require the need for a change in distribution methods used by the freight sector. This will be key to ensuring that national targets are met in the future such as the commitment to go petrol and diesel free by 2050[1].

Short term solution to the clean air challenge would be to shift the modes of transport used for freight to more rail and water focused methods.[2] With new advances in rail and additional rail capacity there is great opportunity to expand the rail freight sector.[3]

Improved connectivity will also allow the freight sector to become more efficient in future years. There has already been CAV technology introduced to heavy goods vehicles such as V2V connectivity (allowing cross-communication between HGVs).[1] This could be advanced upon even further with platooning plans; whereby groups of HGVs could have acceleration and braking functions linked together, making them capable of travelling in queues.[4] This

[1] Connecting the Country: planning for the long term – Highways England, December 2017
[2] Delivering the future: New approaches to urban freight – Urban Transport Group, February 2015
[3] Movement for Growth: The West Midlands Strategic Transport Plan – WMCA
[4] Heavy vehicle platoons on UK roads: feasibility study – Ricardo, TRL, TTR, April 2014

Further Information:
Emily Perry: [Email address redacted]

could decrease congestion, reduce the environmental impact by reducing air resistance on vehicles and lowering petrol/diesel consumption.

To drive successful future road freight operations in Birmingham and the West Midlands, there is a need to explore strategic freight corridors, which allow the reassignment to alternate routes is necessary, especially in times of disruption.

The SRN has a major role in supporting local businesses, and in particular the growing West Midlands Freight and Logistics sector. A number of the area's most significant employers - such as Jaguar Land Rover, Birmingham Airport, NEC, GKN, BMW along with many others - are located in close proximity to and benefit from access to the SRN.

In order to tackle these challenges, TfWM needs closer collaboration with the freight industry to fully understand where failures are within the transport system and how technology and data sharing could play a part to reduce demand failure e.g. missed deliveries.

This could be an area for the NIC to explore further and work with Authorities and the freight industry.

1.2. Which are the key freight corridors that matter the most? Where are the bottlenecks in the freight network, and what investments in upgrades could deliver the best value for money for freight efficiency and UK plc?

With some of the large cross country motorways including the M5, M6, M40 and M42 – the West Midlands is a key corridor for freight in the UK. However, many sections of the Birmingham motorway box are grade separated and cannot be widened

The Midlands Motorway Hub Study, led by Midlands Connect, is currently being further developed, exploring how connecting to and on the major motorways in the region – particularly useful to the freight sector – can be improved.

In support of this study, Government, Highways England and TfWM are continuing to work to make better use of M6 Toll, including the wider use of Operation Freeway. This would help to reduce the volume of traffic re-routing through the urban areas with associated air quality, noise, safety impacts and improving overall network resilience. Importantly this could provide greater capacity for road freight.

Furthermore, Midlands Connect and Highways England are developing the case, through the RIS process, to improve network resilience, by adding further capacity to the SRN including plans to introduce smart motorway schemes to the M5-M42 Birmingham box (Phase 4).

In the West Midlands future investment in the rail network, as highlighted in the West Midlands and Chilterns RUS, at Water Orton (a current rail freight capacity challenge) and Kings Norton, will allow for additional future rail freight capacity. These scheme require urgent delivery as a key component of the Midlands Rail Hub.

Brexit is a major concern and raised issued over the import of goods from the European continent. It is thought that this may have knock on effects for freight on roads due to increased waiting times for unloading of goods and successful porting.[5] The West Midlands Key Route Network (KRN) is importance for movement of goods across the country.

The UK is ranked the highest in Europe for congestion – it is thought that we lose £31 billion per year in productivity and economic growth. In Birmingham the most congested region is where the A38 meets the M6. In fact the M6 also suffers delays in Coventry. This causes knock on delays all along the Northbound M6 and this is a key strategic road regularly used for freight.

[5] Allianceshippinggroup.co.uk

Further Information:
Emily Perry: [Email address redacted]

Congestion on the M6 is responsible for a loss of over £2 billion to the UK economy. Congestion on the M5 in Bristol costs us a further £1.6 billion due to knock on effects across the network. There are also a number of A-roads which are highly susceptible to congestion including the A4039 in Wolverhampton. [6]

The West Midlands Freight Strategy also acknowledges that access to the urban centres and parking are widespread problems for the freight industry. Authorities need to collaborate close to address these issues.

1.3. To what extent are the economic benefits of freight factored into wider transport infrastructure investment planning?

The disruption of goods is central to economic growth, especially post Brexit. Although freight is included in WebTAG compliant appraisals as value of time, it felt that the benefits of freight are not fully reflected in the value of goods transported or the real value to the economy.

For, example, some of the benefits of transferring freight from road to rail are picked up in Network Rail's appraisal process but this does not capture all of the wider productivity benefits. The NIC should explore the opportunities to investigate this further.

The introduction of CAZ will create the need for smarter, low emission transport, which may link to the Urban Transport Groups suggestions for greener 'last mile' freight from distribution centres to cities.[1, 2]

1.4. What are the regulatory and legal issues that, if changed, could improve freight efficiency without increasing costs or reducing efficiency?

Depending on how current HGV platooning trials go, the potential to use such connectivity between vehicles would mean that large quantities of goods could all be shipped in one go, saving on time and preventing congestion.[3] This would also allow savings on petrol/diesel costs and reduction in emissions.

Better use of our current railway stations as freight hubs during the night, when passenger train services are not running could be an excellent way to utilise infrastructure that is already in existence.[2] This would increase efficiency, reducing the reliance on HGV transportation. Equally, changing the majority of freight traffic to off peak times would vastly increase efficiency with no requirement for extra expenses aside from staffing costs (for unsocial hours).

Question 2: How might the demand for freight develop and change over the next 20-30 years?

2.1. How has the demand for freight, and types of freight, changed over the last 2 decades, and what will be the drivers for changes in the future?

Over the past few years, the movement towards a 'gig-economy' has meant that freight has grown substantially.[1] Businesses such as Deliveroo, Uber-eats, and competition between private couriers such as Yodal and Fedex have meant that on demand and convenient next day delivery are commonplace now in society.[7, 8] The issue with this type of freight is that often, delivery vehicles (usually vans) are carrying far fewer goods at a time, yet the mileage is increasing.[9] This is neither an economical nor efficient method of delivery. Overcoming the demand for next-day delivery service and expectations of customers will be a huge challenge for the freight industry in the future. Better cross-talk and shared responsibility between these companies may allow better utilisation of vehicles.

[6] http://www2.inrix.com/roadway-analytics-hub
[7] Review of the impact of competition in the postal market on consumers – Postal and logistics Consulting Worldwide, March 2015
[8] Tap to eat – Rachel Loi *et al*, *Business Times*, May 2016
[9] Urban Congestion – Urban Transport Group, February 2017

Further Information:
Emily Perry: [Email address redacted]

Additionally the population in the UK has grown significantly over the past 2 decades.[10] The requirements for movement of goods have therefore also increased dramatically, especially within the West Midlands as a key exporting area, the only with a trade surplus with China. Post Brexit, the West Midlands requires better access to national ports and international gateways to secure its ongoing economic success.

It has been forecasted using modelled journey time data from the West Midlands' Strategic Transport Model, PRISM, that a reduction in average speed is imminent. This will increase congestion and there is much requirement to find ways to support freight traffic flows.[3]

2.2. How is the freight industry planning for future changes in the demand? What levers might be available to shape future demand for freight support?

The use of CAVs and platooning of HGVs could be a key lever for meeting the needs of a growing population with increased productivity. Additionally, electronic vehicles which are not reliant on use of the road network such as drones may be useful for meeting the demand for high convenience delivery.[11]

The introduction of Smart motorways with data collection hubs can be used to communicate with vehicles via V2N (vehicle to network) technology. This will enable drivers and businesses to make the most informed decisions about which routes to take. Data collection may be a major game changer for freight and the road network in general.[1]

HS2 is an opportunity for the freight industry. The migration of many passengers from standard rail services to the new high speed service will hopefully significantly reduce traffic on the current railways and offer new rail freight opportunities on the WCML.

The Urban Transport Group (UTG) have suggested that importing of goods from around the world, be docked at the most convenient distribution centres to allow good connections to urban regions. The final mile of freight transportation should also be as green as possible and completed using low emission modes as much as possible.[2]

Question 3: What effects does congestion have on the efficiency of freight movements and emissions?

3.1. How does congestion impact upon the productivity and economic contribution of freight? To what extent does congestion affect changes to mode, time or other freight choices?

Congestion has a major effect on the freight sector with 25% of all road freight journeys being delayed by congestion. The large numbers of freight vehicles on the road (15-20% of all road traffic) are responsible for the majority of congestion. LGVs in particular make up 13% of traffic.[2] In the West Midlands, congestion is a large problem for the freight and logistics industry. Road freight may only account for 6% of the traffic fleet – but it accounts for 30% of the total regional economic impact (approximately £600m per year). According to Trafficmaster there are delays on most of the key arteries into the city when compared to free-flow, overnight traffic. It is also foreseen that congestion is destined to worsen in the coming years if we do not innovate and act to improve corridors.[12]

Rail freight is also susceptible to congestion as passenger train services often cause delays on the line. A shift towards increased freight trains will be best achieved if it is combined with a shift towards the majority of freight occurring over night or during

[10] Overview of the UK population – Office for National Statistics, March 2017

[11] How delivery drones could transform the world – Tim Harford, *Financial Times,* December 2013

[12] https://www.teletracnavman.co.uk

Further Information:
Emily Perry: [Email address redacted]

off peak times. This will prevent congestion during times when passenger trains are operating.[2]

In the West Midlands future investment in the rail network, as highlighted in the West Midlands and Chilterns RUS, at Water Orton and Kings Norton, will allow for additional future rail freight capacity. These scheme require urgent delivery as a key component of the Midlands Rail Hub.

3.2. How does congestion affect the environmental impacts of the movement of freight?

Usage of LGVs is also increasing with increased on-demand delivery services. Often such vehicles are reliant on diesel and produce a higher quantity of emissions per kg of freight simply because they are not utilised properly.[13] However there is more scope for application of carbon neutral technologies for smaller freight vehicles.[14]

HGVs on the other hand pose a bigger challenge, as it is not foreseeable that totally electric or hydrogen fuel cell engines will be a viable option for vehicles of this magnitude. To overcome this there have been suggestions to introduce overhead charging cables for HGVs on motorways. This would require large scale infrastructural development though, and could take an incredibly long time.[1]

3.3. With limited space for new infrastructure, how can we better use our existing urban network to support freight? Are there changes – such as changes to modes, methods or delivery times – that could help reduce the stress on the urban transport network?

The most sensible option – if space for infrastructure is an issue – would be to increase freight via rail, pipeline or water transport. This would alleviate some of the pressures on motorways by reducing congestion and also provide a greener alternative to heavy road usage.[2]

The newfound convenience of next-day-delivery and on demand services pose a threat to the environment and overuse of our road network. Perhaps better cross-talk between couriers and delivery companies may allow better efficiency so that fewer empty vehicles are using the roads. There will always be a compromise between convenience and efficiency, but perhaps increased pressures on companies to use their vehicles more sensibly will reduce congestion and control emissions.[15]

Question 4: How can freight lower its carbon and air quality impacts?

4.1. Are there efficiencies within freight management and distribution that could help reduce the CO_2 and NO_x emissions from freight?

Birmingham City Council are conduction a feasibility into potentially introducing a Clean Air Zones (CAZ)

This could include two different types:

- Non-charging CAZ: where there is no charge for any type of vehicle to use roads, but it is discouraged
- Charging CAZ: Where certain vehicles (with high emissions) will be charged for using the road.

Both Birmingham City Council and WMCA wish to work with businesses in the freight sector to ensure that the best solutions for both the economy and the air quality can be reached.[16]

Birmingham City Council has created a toolkit to support the development and implementation of Delivery and Servicing Plans (DSPs) by businesses and

[13] Why "I want it now" may be the root of all our congestion problems – Rob Flello MP, *Freight Transport Association,* April 2017
[14] Electric Delivery Vehicle Trial – www.london.org.uk
[15] An analysis of the postal market and parcel carriers' operations in the UK – Julian Allen *et al,* University of Westminster FTC2050 study
[16] www.birmingham.gov.uk

Further Information:
Emily Perry: [Email address redacted]

organisations operating in Birmingham. The aims of the Delivery and Service Planning Toolkit are to:

- Increase the efficiency and reliability of deliveries for businesses and saving on costs
- Improve the quality of the environment by reducing congestion, collisions and emissions (including a shift to low emission freight vehicles); ultimately making the area more attractive
- Promoting business awareness of delivery and servicing activities reaping financial, environmental and operational benefits for the region.[17]

A shift towards more delivery sharing could reduce some of the pressure on British roads. The vehicle miles from vans have increased by 45% since the year 2000: only 6% for cars over the same period. The environmental impact of this is incredibly significant, making reforms to the small scale freight sector all the more relevant.[8]

UTG have proposed increasing freight by rail or water for long distances and a movement away from using HGVs in excess. It is also suggested that the final mile of delivery should be by the most environmentally friendly mode possible – shifting to partially electric, hydrogen cell or bio-fuelled vehicles. Strategic planning to ensure transnational goods are delivered to ports as close to final destinations as possible would reduce the reliance on freight by road traffic, thus reducing congestion and contributing far less to poor air quality.[2]

Current HGV platooning trials underway may open up the freight sector to a more efficient/affordable solution, whereby congestion, accidents and journey times are reduced. Reducing air resistance and allowing connectivity of braking/acceleration will also increase fuel efficiency, so that air quality is improved in the long run. Up to 3 HGVs can be platooned at present but this could increase as technology advances.[4, 18]

4.2. What role do alternative fuels such as electricity, Liquid Petroleum Gas and biofuels have to play? What are the barriers and challenges to wide-scale uptake of alternatives to diesel and what could be done to help remove these issues?

With a strong movement towards electric vehicles and plans to become completely petrol free by 2050 the future for freight must follow suit. However HGVs are a huge challenge due to the energy required to power vehicles of this weight. There is currently only technology available to create partially electric heavy goods vehicles.

The use of diesel in LGV and HGVs poses a major risk to plans for clean air. The use of Biodiesel may be advantageous as a short term solution. It is produced from natural biological sources (usually vegetable oil) and can be blended with pure diesel by several different ratios. 30% biodiesel has been found to reduce CO emissions by 83%, making it the lowest carbon fuel. However, an increase was seen in NO_x emissions. Different proportions can be mixed to get an ideal balance, making biodiesel an ideal substitute – if mixed properly.[19]

Liquid Petroleum Gas is more ideally suited as a substitute in lighter vehicles such as cars and smaller vans. It is ideal however due to its cleaner, non-toxic combustion.[20]

A Midlands Connect study into the feasibility of a Midlands wide Low Carbon Fuel Infrastructure study,

[17] https://www.birmingham.gov.uk/info/50028/transport_information/573/freight_and_logistics/2
[18] Semi-automated truck convoys get green light for UK trials – Gwyn Topham, *The Guardian,* August 2017.
[19] Nation's strictest regulatory board affirms biodiesel as lowest carbon fuel – Jessica Robinson *et al,* National Biodiesel Board, September 2015
[20] Combustion and Exhaust emission characteristics of a compression ignition engine using liquid petroleum gas-fuel-oil blended fuel – Qi *et al* – Energy Conversion and Management, February 2007

Further Information:
Emily Perry: [Email address redacted]

which specifically looks at opportunities for HGVs and LGVs is currently underway.

This work would builds on the successful work by Birmingham City Council's 'Blueprint for Low Carbon Fuel Infrastructure'. TfWM and Midlands Connect would be happy to share the findings of this study with the NIC.

In the West Midlands we are piloting a scheme with Hydrogen buses. This is an example of our openness as a region to innovation which will benefit our clean air zones. The West Midlands is pushing towards increased renewable energy sources – such as Birmingham Bio Power Ltd at Tyseley Energy Park. As a region we support the movement of both private and public sector fleets to low and zero emission vehicles and expect that Tyseley Energy Park will be supportive in this policy.[21]

4.3. What technologies could best and most realistically be utilised to manage the carbon impacts of freight, both within urban areas and on longer strategic journeys?

Biodiesel is a putative substitute to diesel with no changes to engines of the current freight fleet required. Replacing all diesel at petrol stations with Biodiesel-diesel hybrid fuel could be an ideal short-term change.[16] However in the long term, with an aim to become completely petrol and diesel free and carbon neutral by 2050 and a ban on petrol/diesel fuelled cars by 2040, this does not go far enough. In the meantime switching to Biofuel will help to lower emissions in the immediate term. This could be useful whilst new technology and innovation is developed to allow potential electric and hydrogen fuelled HGVs and LGVs in the future. Or even during infrastructural changes such as the introduction of overhead HGV charging cables.[22]

Within urban areas, final destination short journeys should make use of the greenest transport mode possible. Perhaps the use of electric vans which have been trialled previously in London might become more widespread. Unlike Biodiesel as a replacement however, this would require an entire change of the vehicle fleet – with only 0.1% of all vans at present being electric.[2]

Longer strategic journeys could be shifted towards increased rail freight and strategic shipping to ideal ports could be used to ensure that unnecessary road journeys are not relied on so much. The shift to increased rail freight may be aided by the development of HS2 somewhat alleviating the current railway lines – allowing for more freight trains.[2] There is even scope for extremely off peak freight trains to be able to utilise HS2.

This however is not planned at present.[2] Instead, ongoing electrification of the railways on a more widespread basis will be invaluable to the freight industry. This will lower carbon emissions for several reasons. Not only are trains able to transport a higher volume/weight of goods per journey, but they are also less dependent on diesel than HGVs.[23]

There are different types of HGV on the roads and they can be categorised by their European standard. Both the Freight Transport Association (FTA) and the Road Haulage Association (RHA) have suggested gradually phasing out the older and less environmentally friendly HGVs so that by 2019 only the most modern (Euro VI) HGVs are allowed on roads and that even these are restricted to certain hotspot areas by 2021.[24, 25]

Question 5: How could new technologies be utilised to increase the efficiency and productivity of UK freight?

[21] Midlands Engine Strategy – Department for Communities and Local Government, March 2017
[22] 'We'll have to become electricity traders' – Biofuel market reacts to UK petrol ban – Vicky Ellis, *ICIS,* July 2017
[23] Heavier lorries and their impacts on the economy and the environment – *MTRU,* October 2007
[24] Accommodating Freight in Clean Air Zones – RHA, May 2017
[25] http://www.fta.co.uk

Further Information:
Emily Perry: [Email address redacted]

5.1. How will new technologies change the capacity and performance of the freight transport network? Over what timeframes might these new technologies begin to affect the freight transport network?

According to Highways England, Smart motorways should be introduced gradually over the next 20-30 years. Smart motorways will have improved road capacity as well as better connectivity and road monitoring. In the long term all motorways should eventually become smart motorways with additional plans to even improve connectivity of trunk roads by 2050 by creating 'expressways' with improved connectivity and technology.[1]

However, greater consideration is needed for RIS2 and future RIS periods (as well as the ongoing investment and maintenance projects in RIS1) for the impact of night closure and restrictions on businesses, especially for the movement of key goods and products. The West Midlands, as a crucial exporting region, relies on the movement of goods at night to support our ever growing economy. Businesses need to buy into any necessary works and TfWM can assist Highways England with this.

A shift towards the use of electric vehicles will not only contribute to improving the environment, but in the long term it will likely reduce costs as vehicles will not rely on the highly unpredictable petroleum market.[26] On the contrary a global movement towards increased use of electricity will increase the raise for power. It is also likely that taxation on electric vehicles will increase in the long run when electric vehicles become the majority of the driving fleet.[18]

Improved connectivity between freight traffic will allow for better quality decision making. By linking up the Birmingham City Council's Urban Traffic Management Control (UTMC) with that of the Highways England, better advice about which radial routes to use to access Birmingham can be delivered. This will be improved further by the Regional Integrated Command Centre (RICC), which is being developed by the WMCA and supported by DfT, as agreed in Devolution Deal 2.[27]

HGV platooning has already been discussed in this response, but technology is also being developed to allow for partially autonomous trucks which sense changes in the environment as well as monitoring behaviour of the driver to improve safety and efficiency. The TANGO project in Germany which aims to develop this technology will end in 2020 so trials could begin soon afterwards.[28]

In the very long-term, drones and droids may be utilised for small deliveries. Indeed droids are already being trialled in London by Just Eat.[29]

5.2. How can the use of data such as real-time traffic information by artificial intelligence and machine learning systems help to improve freight efficiency and productivity? How might this affect the business models and requirements of freight in the future? Are there any barriers to the greater use of data in freight

The use of AI and data tracking will be of great importance to transport and efficiency. Observing the efficiency and potential problems associated with the substantial changes to the transport fleet will help to make well informed decisions moving forward. On a day to day basis, data collected by vehicles and motoring and public transport hubs can all be used to formulate solutions when problems arise. For example, detection of potential congestion sites early on will allow drivers and companies to make decisions more efficiently. It is thought that collection of data

[26] Electric cars already cheaper to own and run than petrol or diesel – study – Damien Carrington, *The Guardian,* December 2017
[27] Birmingham Connected Technical Work Package 3, Servicing and Logistics, November 2014
[28] https://projekt-tango-trucks.com
[29] Delivery robots to replace takeaway drivers in London trial – Cara McGoogan, *The Telegraph,* July 2016

Further Information:
Emily Perry: [Email address redacted]

will be utilised more and more over the coming years during implementation of a more connected driving fleet.[1]

As referenced in question 1.1, one of primary barriers to closer collaboration with the freight industry to fully understand failures within the transport system is the commercially sensitive of data sharing and a perceived loss of competitive advantage.

Birmingham City Council have proposed the use of advanced vehicle detection at key signalised junctions to aid the smooth flow of traffic. In addition variable message signs (VMS) will enable up to date, reliable journey information to be provided to the road user.

How do you see technologies such as HGV platooning, digital railway signalling and autonomous vehicles being integrated into freight distribution?

The West Midlands is a leading area for CAV and vehicle technology, and there is much scope for trialling and implementing new technology in the coming years. If fact, roads in the Midlands are set to be the testbed for autonomous vehicles.[30]

HGV platooning trials have already been announced in the UK and should they prove successful, the freight industry could transform significantly. Small groups of 3 HGVs could be platooned requiring only one driver to control all of the vehicles. At this stage drivers must still be present in all vehicles to override the technology, should a problem occur. This will undoubtedly increase efficiency and productivity as there will be reduced air resistance and less fuel wastage as a result of human error. E.g. braking will not occur unless necessary. [4, 16]

Improvements to rail signalling by introduction of ETCS (European Train Control Systems) could prevent unnecessary congestion and waiting times by increasing connectivity of freight traffic. Instantaneous signalling reliant on artificial intelligence and monitoring will be particularly useful on railways due to the required communication between passenger trains and freight trains. Such technology can also be used to improve decision making in a safer and more efficient way.[2, 31]

The future of transport could largely be autonomous. Autonomous cars are already being trialled and strategic road investment plans are taking the inevitable shift towards driverless vehicles into consideration. As connectivity increases it is likely that the majority of the passenger and freight fleets will be partially or completely autonomous in the future.

5.3. How might regulations and physical infrastructure need to adapt to new technologies and business models in the freight sector?

With the emergence of autonomous vehicles we must be mindful of the potential safety threats as well as opportunities. The major safety issue will be cyber-security.[32] Particularly in the freight sector where heavy goods vehicle hacking could be devastating. It is important that every effort is made to ensure hacking is as unlikely as it possibly can be.

The introduction of app-based technology has proven highly transformative in the courier and delivery service industry. This may in time be applied to larger scale freight movement, whereby businesses can request on-demand services for large scale deliveries. Indeed, companies such as Convoy and Cargomatic in the US have already begun using such "trucking-app" systems. This may be highly disruptive of plans to reduce emissions and congestion. This may require some type of government intervention in future.

[30] Midlands Roads to be UK autonomous vehicle testbed – Peter Dunn, *University of Warwick*, October 2017

[31] Time for Change: developing the future of signalling systems – Ben Dunlop, *Atkins global,* March 2016

[32] The cyber-security risk of self-driving cars, Jason Kornwitz, https://phys.org February 2017

Further Information:
Emily Perry: [Email address redacted]

These apps could prove useful to the freight industry if they are utilised to make sensible decisions and cross-talk between different companies exists.[33]

If the driving fleet is to become completely electric by 2050, huge expansion of charging infrastructure will be necessary. There may be cause to rethink the number of slip-roads and service stations along our motorways in future. Additionally vehicles such as larger HGVs may require charging cables to be introduced to motorways. In the long term there is the potential to introduce 'contactless charging' – whereby wired up roads have the capacity to charge up vehicles as they drive.[34, 35]

Question 6: Are there good examples internationally of freight systems, policy, infrastructure or technology development and implementation that the UK can learn from to increase freight efficiency and/or reduce the carbon and congestion impacts?

Over the past 5 years France has significantly increased its HGV loading factor. This has been aided by developing haulier networks between individual haulier companies ensuring that better strategic decisions are made. In addition France has built 2,700 miles of motorway in the past 30 years which has further contributed to the freight industry.[36]

Many other countries including Spain (Benalux), Germany and Italy have adopted similar networks to aid the logistics sector. In addition the use of Teleroute between and within many European countries has reduced empty running by 43%. Such computerisation of freight planning is destined to ensure that freight will be as efficient as possible in the future.[37]

Ten businesses in Germany and Switzerland are trialling the first fully-electric heavy duty eActros trucks from Mercedes-Benz. The vehicles, which can be either 18 or 25 tonne – are being tested to demonstrate battery range and performance in urban environments. The vehicles offer up to 200km in range from full charge. The eActros drive system comprises two electric motors located close to the rear-axle wheel hubs. These generate a reported output of 125 kW each, with maximum torque of 485 Nm each. Charging takes between three and 11 hours presently.

Businesses in the logistics, retail and commodities sectors are taking part in the trial, including:

Dachser; Edeka; Hermes; Kraftverkehr Nagel; Ludwig Meyer; Pfenning logistics; TBS Rhein-Neckar and Rigterink; Camion Transport; and Migros. The electric trucks will be replacing diesel vehicles during the twelve month test-run.

According to Stefan Buchner – Head of Mercedes-Benz trucks – there are 2 and 3 axle variants of the electric trucks. Initial focus will be on inner-city goods. The vision is that the trucks will bring about cleaner air and less noise, whilst being largely unaffected by access restrictions in major cities. If proven successful, the trucks may provide a useful way to implement to UTG 'last mile' policy where the final part of delivery journeys are made using the greenest possible mode of transport.[38, 2]

[33] How "Uber for Trucking" Apps are Driving Change in the Freight Industry – Russ Bonham, *Forbes,* February 2016
[34] Electric car makers look along road to contactless charging – Peter Campbell, *Financial Times,* May 2017.
[35] Making the Connection: The Plug-in Vehicle Infrastructure Strategy, Office for Low Emission Vehicles, June 2011
[36] FTA Logistics Report, 2016
[37] Load Factor: which country is the most efficient in Europe? www.wktransportservices.com June 2017
[38] https://airqualitynews.com

Suffolk County Council

Date: 5 March 2018
Enquiries to: [Name redacted]
Tel: [Telephone number redacted]
Email: [Email address redacted]

Freight Study Call for Evidence
National Infrastructure Commission
5th Floor
Eastcheap Court
11 Philpot Lane
London
EC3M 8UD

Dear Sir / Madam,

Suffolk County Council Response to Freight Study Call for Evidence

I am writing to you to provide Suffolk County Council's response to the National Infrastructure Commission's Freight Study Call for Evidence. Suffolk has the United Kingdom's busiest container port at Felixstowe, which handled over 4,000,000 TEUs (Twenty foot Equivalent Units) in 2016, approximately twice as many as the next busiest port. It has previously been estimated that approximately 10% of people employed in Suffolk are linked to activities at the port.

Understandably, journey reliability is a key driver in logistics and therefore the better the transport network to/from the port, the greater the port's potential. Network capacity is seen as the prime constraint on growth at the port, and this is becoming more of a concern with the proliferation in 'mega ships', which are creating greater peaks in container flows, meaning the ability to transfer containers to the transport network efficiently and expeditiously is vital.

<u>Road Network</u>

The majority of the key freight road network through Suffolk forms part of the Strategic Road Network, and is therefore the responsibility of Highways England. Suffolk County Council have undertaken significant work in looking at future growth along the SRN in Suffolk and identifying future constraints.

Image 1 below indicates the number of hourly HGV movements in Suffolk at specific measured locations with the corridor of large towers representing the A14. Some locations have over 1,000 hourly HGV movements, on a two-lane dual carriageway; highlighting the A14's importance as a strategic corridor for freight traffic.

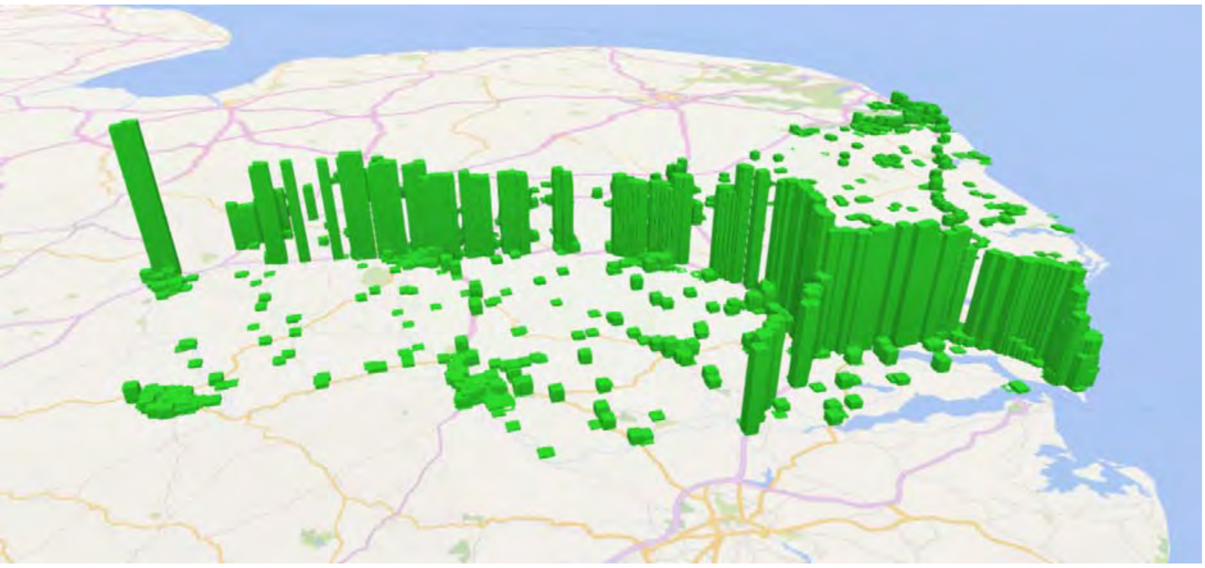

Image 1 – HGV movements in Suffolk

Orwell Bridge

The Orwell Bridge is a dual carriageway bridge over the River Orwell between junctions 56 and 57 of the A14 and is on the direct route to/from Felixstowe Port. Due to the bridge's design, it can often be closed for planned works, high winds, and road accidents. This can mean that all HGVs travelling to/from the port have to negotiate through Ipswich town, which results in significant delays to freight traffic. Over five years there have been 23 whole carriageway closures, 12 total closures and 144 less substantial form of closure, which will have led to some form of delay. Suffolk County Council are currently developing a Strategic Outline Business Case for a northern relief road for Ipswich, this would reduce reliance on the Orwell Bridge and subsequently increase journey reliability for all traffic including freight movements, which would improve investor confidence at the port.

Junction 55 – Copdock Interchange

Junction 55, known as 'Copdock' forms the meeting point of the A14 and A12 in Suffolk, but the junction is only partially grade separated meaning that movements between the A12 and the A14 need to negotiate traffic signals, which results in delay.

An independent VISSIM model was created to test Junction 55. In 2036, the do nothing scenario shows significant queuing on all arms, with nearly 4km queues on the A14 east and west and the A12, resulting in significant and frequent delays to freight traffic.

A number of options have been assessed for the junction and it is recommended that the provision of a flyover for traffic from the A12 travelling to the A14 eastbound as well as widening of the southern bridge provides a complete solution to the junction. It provides the most benefits, resolves the queuing on all approaches and solves the problem in a much more significant way. This is the only option that would also accommodate additional future growth to 2036g.

Junction 58 – Seven Hills

The A14 mainline runs over junction 58, Seven Hills, which is a 4-arm un-signalised roundabout. The A14 off slips meet the A12 and A1156. Currently traffic heading towards the A14 eastbound on slip and traffic coming from the A14 eastbound off slip heading onto the A1156 restricts traffic on the A12 from entering the roundabout. Queues on the A12 and A14 westbound off-slip can be long and delays at this junction are relatively significant.

Reducing queuing at this junction would result in improved resilience and journey time across the network.

There are a number of other junctions across Suffolk that have the potential to result in delays for strategic traffic due to queuing from the slip onto the A14 carriageway in future scenarios, these include Junction 43, 44 and Junction 56.

SCC also recommends Highways England undertake a route study on A14 Felixstowe to M11 to fully understand capacity and performance issues and future requirements.

Air Quality and Noise

A variety of air pollutants have known or suspected harmful effects on human health and the environment. Air pollution is a major environmental risk to health. By reducing air pollution levels, countries can reduce the burden of disease from stroke, heart disease, lung cancer, and both chronic and acute respiratory diseases, including asthma. The lower the levels of air pollution, the better the cardiovascular and respiratory health of the population will be.

Policies and investments supporting cleaner transport, would reduce key sources of urban outdoor air pollution. Reducing outdoor air pollution also reduces emissions of CO_2 and short-lived climate pollutants, thus contributing to the near and long-term mitigation of climate change.

Investment should ensure that we look to minimise the air quality and noise impacts from freight traffic, and new technology that achieves this should be introduced as quickly as possible, this is also why we need to increase capacity on our rail network, to ensure as large a modal shift onto the railway as possible.

Rail Network

Since 2004 the number of units from the port being transported by rail has increased by almost 100%, with the rail modal share from the port increasing by 8% during the same time period. One of the major advantages of rail freight is its reduced carbon impact through transferring HGVs from the road network. Reliance on freight by rail is only likely to increase and significant investment is needed in rail infrastructure in East Anglia to support this. Electrification of the freight railway network would also help to reduce the carbon impact of freight traffic.

As part of the Anglia Route Study it has been identified that by 2043 there is a shortfall in freight capacity and a gap in connectivity outputs that require addressing on the Felixstowe to Nuneanton corridor. Significant infrastructure change would be required to fully accommodate the forecast growth and improved passenger service.

In order to accommodate future growth, Infrastructure changes would be required in the following locations:

- Haughley Junction
- Ely area
- Ely to Soham
- Trowse Junction
- Felixstowe Branch line

Necessary improvements include the following:

- Doubling of sections of the Felixstowe Branch
- Improved signalling headways on the Bury St Edmunds line
- Ely area improvements including level crossings and headway reductions
- Ely to Soham – doubling or partial doubling of single line section There may be an opportunity through the roll out of improved signalling to achieve headway improvements on this corridor and this should be examined further through the Digital Railway Programme.

Freight capacity is needed to cater for future demand. Anglia provides nationally important freight routes particularly for intermodal port traffic from the Port of Felixstowe and London Gateway. The forecast growth in freight over the next 30 years is significant across the region.

The overall forecast freight growth across Great Britain is for an increase in total tonne-kilometres of 2.9% per year to 2043. Currently, intermodal traffic comprises around 30% of tonne-kilometres nationally. This is forecast to grow to an 80% share of total tonne-kilometres by 2043 as a result of strong forecast growth in intermodal traffic. Forecasts for Great Britain show average annual growth in intermodal to 2043 of approximately 6%, in terms of tonne-kilometres. This reflects growth of about 5% per annum for the ports. The overall growth reflects forecast trade growth and an improvement in the competitiveness of the rail industry.

A number of improvements along the corridor are required, as a minimum, to support this growth, and significant investment in improved signalling / electrification and additional infrastructure is required if we want to have an exemplar rail network.

Haughley Junction

The forecast demand for up to 2043 is five trains per hour (tph) for freight and 7tph for passenger services passing through Haughley Junction per direction. Due to the speed differential between passenger and freight trains and the crossing of key flows, to fully achieve the 2043 outcome will require further work in the Haughley Junction area to segregate the flows. This could be through grade separation or through a short section of four-tracking.

Ely / Soham

The single-track section between Ely and Soham is a capacity constraint for any increase in either freight or passenger services via this corridor. The single track remains a constraint and additional capacity will be required between Ely and Soham to support the 2043 level of service.

Ely Area

The speed differential of a mix of both passenger and freight in the Ely area would require interventions, such as three to four-tracking between Ely Station and Ely North Junction or grade separation at both Ely Dock Junction and Ely North Junction, to remove the constraints of crossing moves, platform usage and line utilisation in the Ely area.

An alternative option has also been assessed which considers the installation of a new railway link on the west side of Ely (an avoiding line). This would remove the interaction between freight and passenger services in the Ely area and therefore reduce the required infrastructure work at junctions, level crossings and platforms.

Trowse Junction

Doubling Trowse Swing Bridge not only supports the capacity required on the Great Eastern Main Line but also provides the necessary capacity to cater for an additional Norwich to Ely / Cambridge Service.

Felixstowe Branch

To robustly accommodate freight conditional outputs to 2043 alongside the passenger service on the Felixstowe Branch will require full doubling of the branch.

These infrastructure improvements represent a minimum to achieve forecast growth, let alone the ambitious growth that the United Kingdom should be targeting.

Yours sincerely

[Name redacted]
[Job title redacted]
Growth, Highways and Infrastructure

Twf Canolbarth Cymru Growing Mid Wales

The Growing Mid Wales Partnership is a strong regional partnership comprising of representative bodies from across the private, public and voluntary sector in mid Wales, and was established early in 2015.

The Partnership seeks to achieve more and better economic outcomes across the region, and work in partnership to achieve this. As part of our partnership working, we have worked with the Marches LEP on taking forward our joint Freight Strategy.

The is the Growing Mid Wales Partnership has undertaken a regional response to the National Infrastructure Commission, Freight Study Call for Evidence., as we consider how the national infrastructure developments is of vital importance to Mid Wales, and will affect our outcomes going forward.

You have requested responses to a number of questions relating to the movement and development of freight.

The Growing Mid Wales Partnership has been working in partnership with the Marches LEP on our joint Freight Strategy and this has recently been launched.
http://www.tracc.gov.uk/index.php?id=1&L=0

QUESTIONS

1. **What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?**

1.1. What do you see as the key drivers to a successful freight system that is fit for the future?

Businesses want journey time reliability, resilience and continuity of network to allow them to make investments and grow businesses with certainty about meeting customers' expectations. Freight is not just about HGV and freight trains, DfT statistics show a steady increase in smaller vehicles LCVs (white vans) as the internet-driven economy accelerates, just in time business to business sales and online retail sales, etc. Much of the network used for this is the rural single carriageway network.
Having a network that is capable of real-time communication with drivers allow decisions to be made quickly regarding route planning to avoid delays. Entails comprehensive mobile phone coverage and further 4g investment is needed.

1.2. Which are the key freight corridors that matter the most? Where are the bottlenecks in the freight network, and what investments in upgrades could deliver the best value for money for freight efficiency and UK plc?

The Marches and Mid Wales Freight Strategy provides robust evidence for priorities within the strategy's interventions. The Industrial Strategy's aim to improve productivity and shape a stronger and fairer economy by spreading economic growth throughout the UK.

It is essential to ensure that investment programmes, reflect the transport characteristics and needs across the Marches and Mid Wales areas. Therefore as part of current work, we are prioritising our schemes, which are best suited to improve intra and inter-regional transport by road within and through these regions.

We are currently working to create a "joint appraisal framework". This will be used to assess potential interventions and road improvement schemes across the Marches and Mid Wales regions. It will be in line with formal WebTAG and WelTAG methodologies, and provide a prioritised list of projects, which will inform both the transport aspects of the LEP's new Strategic Economic Plan Local Industrial Strategy due to be published in September 2018 as well as the Growing Mid Wales Regional Integrated Economic Plan also due later this year.

This work will provide evidence that Midland Connect, Highways England and DfT will have available for their reviews of the SRN and development of the MRN, which will form part of the key freight corridors, and the Welsh Government's National Transport Strategy review 2018/19.

1.3. To what extent are the economic benefits of freight factored into wider transport infrastructure investment planning?

. Our joint regional strategy provides evidence to support the wider economic benefits that can be achieved through investing in the network outside of the large urban areas and so align with the Industrial Strategy, which highlights the need to for the UK as a whole to improve productivity and shape a stronger and fairer economy. Our evidence demonstrates that by delivering a range of interventions to support freight it is possible to achieve growth regionally and nationally.

1.4. What are the regulatory and legal issues that, if changed, could improve freight efficiency without increasing costs or reducing efficiency?

The freight industry has highlighted that providing qualified HGV drivers takes too long and is expensive. Providing a system that reduces the time and expense in obtaining a licence would lead to more people coming into the industry, and thereby allow business access to a skilled workforce in the UK.

Access to suitable off-road facilities pose problems, to drivers and residences along freight corridors. Parking facilities often full, expensive and insecure, therefore there is a need to improve and ensure minimum standards are delivered, which would encourage more female drivers, into the industry.

2. **How might the demand for freight develop and change over the next 20-30 years?**

2.1. How has the demand for freight, and types of freight, changed over the last two decades, and what will be the drivers for changes in the future?

The UK will be leaving the EU Single Market and the Customs Union, what type of trading agreements the UK will have in the future, will determine how the freight industry needs to change to take account of the new opportunities and challenges. It is likely that there will be significant effects on current freight routing and storage requirements, changing destination ports and possibilities of changing warehousing and distribution with possibilities for customs free zones.

According to the Freight Transport Association, some 13% of HGV drivers and 26% of warehouse operatives are citizens of other EU countries and this implies that labour costs in the road haulage and wider logistics sector will rise, as a continuous supply of employees from the EU will no longer be available. Much existing freight activity is provided for by operators based outside the UK. As stated in the response to question 1.4, industry needs to change, to take account of likely upward pressures on labour costs as employers are squeezed to offer higher wages, pay for HGV driver training and improve working conditions to maintain their workforce requirements.

2.2. How is the freight industry planning for future changes in the demand? What levers might be available to shape future demand for freight transport?

No comment.

3. **What effects does congestion have on the efficiency of freight movement and emissions?**

3.1. How does congestion impact upon the productivity and economic contribution of freight? To what extent does congestion affect changes to mode, time or other freight choices?

Within the Mid Wales context, congestion on the Mid Wales network is generally due to resilience and road safety issues, which result in road closures. Further difficulties arise for HGVs, in that once they enter the extensive rural single carriageway network, it is often not possible to turn and therefore they have to wait until the network opens and moves again.

3.2. How does congestion affect the environmental impacts of the movement of freight?

No comments.

3.3. With limited space for new infrastructure, how can we better use our existing urban network to support freight? Are there changes – such as changes to modes, methods, or delivery times - that could help reduce the stress on the urban transport network?

No Comments

4. **How can freight lower its carbon and air quality impacts?**

4.1. Are there efficiencies within freight management and distribution practices that could help reduce the CO2 and NOx emissions from freight?

On the rural road network in Mid Wales, the need is both to reduce journey times and increase journey time reliability. This can be achieved by providing improved road surfaces and reduce/take out bends in the highway as well as ensuring consistency of width to allow HGVs in opposing directions to pass on these single carriageway routes. This type of interventions result in HGV and vehicles not needing to change up and down the gearbox as frequently and reducing the frequency to need to apply the brakes. These in turn reduce tyre wear and reduce emissions.

4.2. What role do alternative fuels such as electricity, Liquid Petroleum Gas and biofuels have to play? What are the barriers and challenges to

wide-scale uptake of alternatives to diesel and what could be done to help remove these issues?

The difficulty for the freight industry is having access to alternative fuels in distant rural locations. In order for this to change, there investment is needed to ensure availability at widely dispersed locations to insure coverage, which then allows a combination of choices and access to fuels for business resiliently, which will support and reinforce behaviour change.

The level of fuel duty applied to alternative fuels will pay a part in the decisions that business take regarding moving to new fuels as will confidence around price and duty levels over expected life of new investments in alternative fuelled fleets.

4.3. What technologies could best and most realistically be utilised to manage the carbon impacts of freight, both within urban areas and on longer strategic journeys?

Rail freight may be able to provide an opportunity to shift some road freight to rail in some markets. However, road freight will remain by far the dominant mode for freight transport in Mid Wales, because of the dispersed pattern of settlement and economic activity, (which reduces the critical mass of traffic to fill a train for any particular location). There are issues related to the infrastructure, which reduce the capacity and capability of the rail network to accommodate freight services here. Without very significant investment in infrastructure, it is not achievable.

5. **How could new technologies be utilised to increase the efficiency and productivity of UK freight?**

5.1. How will new technologies change the capacity and performance of the freight transport network? Over what timeframes might these new technologies begin to affect the freight transport network?

With the increasing use of satellite navigation systems, there is a need to ensure that the managers of HGV fleets and their drivers have up-to-date information on the status of structures such as bridge heights and width restrictions on roads. The Freight Strategy proposes that local authorities in the Marches and Mid Wales should contribute up-to-date data on structures and regulations affecting the highway network at a local level to the **Ordnance Survey National Digital Road Map Database,** so that this information can be made available to the major satellite navigation system manufacturers and software and data providers. The local authorities should also provide the same information to **private sector freight transport planning portals**, such as the internet-based Freight Journey Planner; the latter will not be effective unless mobile phone connectivity is adequate throughout the area. This type of commitment to provide information needs to be matched by investment in the mobile phone 4 g capacity and availability.

5.2. How can the use of data such as real-time traffic information by artificial intelligence and machine learning systems help to improve freight efficiency and productivity? How might this affect the business models and requirements of freight in the future? Are there any barriers to the greater use of data in freight?

As above:-

It would be good if the industry shared information and could share space. However, this type of information sharing across the industry is not normally welcomed because these are businesses that compete with one another, and they would not wish to give a competitive advantage to a competitor.

5.3. How do you see technologies such as HGV platooning, digital railway signalling, and autonomous vehicles being integrated into freight distribution?

The main technological change in the road haulage industry up to 2030 at a national level may be the introduction of 'platoons' of HGVs that travel together on the strategic highways network and provide fuel efficiencies to road hauliers due to being more aerodynamic. These would not be genuinely autonomous vehicles because they would still require a driver to be located in each cab. Without significant technological improvements it seems unlikely that these platoons would be seen on the Marches and Mid Wales road network apart from on the M54 and the M50., , These platoons would reduce overtaking opportunities, except on motorways and dual carriageways, and raise concerns about safety as well as efficiency of the network for other users..

The HGV fleet will gradually become cleaner as road hauliers increasingly invest in new HGVs conforming to Euro VI standards. These vehicles meet stricter emissions standards under both laboratory and real world conditions and remove almost all emissions of particulate matter and reduce nitrogen oxide emissions from HGVs by up to 95%. Further improvements in engine technology up to 2030 may focus to a greater extent on increasing the efficiency of diesel engines and therefore reduce emissions of carbon.

The Mid Wales railway lines have ERTMS Digital signalling system. This has isolated the Cambrian Rail network from the rest of the national network and therefore prevents other operators using the infrastructure. There is limited rolling stock to meet current limited passenger services and no additional available to other operators or to develop more customer responsive or freight services. The future of digital rail must ensure there is sufficient investment in rolling stock to be able to access the network and meet needs of service providers and customers.

5.4. How might regulations and physical infrastructure need to adapt to new technologies and business models in the freight sector?

Given the UK Government's decision to ban the sale of diesel and petrol cars and LCVs from 2040. It seems increasingly likely that the industry will gradually take-up a change in fuel, or moves to electric HGVs and LCVs at a national level for relatively short distance flows. But – without a step-change in battery technology - this is most likely to be for deliveries from distribution centres located close to the major conurbations rather than to towns and cities located in more peripheral locations and will present a major challenge in areas more distant from distribution hubs and major centres.

6**. Are there good examples internationally of freight systems, policy, infrastructure or technology development and implementation that the UK can learn from to increase freight efficiency and/or reduce the carbon and congestion impacts?**

Deliveries of parcels by bicycle are already possible in urban centres and this concept could be expanded to many other towns for lightweight and smaller parcels, particularly as separate infrastructure is developed for cyclists.

With the increased importance of e-commerce, which involves the delivery of smaller parcels rather than larger consignments to retail outlets, the international parcels delivery companies that work for e-commerce retailers are more prepared to hand over parcels for 'last mile' deliveries to local courier companies for city centre deliveries and for deliveries to relatively remote locations such as parts of Mid Wales.

National Infrastructure Commission Freight Study Call For Evidence – Joint submission from the NGVN and REA

The Natural Gas Vehicles Network (NGV Network) is an established trade body which represents a diverse range of businesses involved in the production of gas-derived fuels and gas-powered vehicles, particularly heavy goods vehicles. Given that air pollution, and related preventable deaths, are at unacceptably high levels, the work of our members is vital in developing the next generation of cleaner transport fuels and vehicles.

The NGV Network is one of the six divisions of the Energy and Utilities Alliance (EUA), a company limited by guarantee and registered in England. Company number: 10461234, VAT number: 254 3805 07, registered address: Camden House, 201 Warwick Road, Kenilworth, Warwickshire, CV8 1TH.

The REA is a trade body representing renewable energy producers. Its Renewable Transport Fuels Group has members active in biomethane as well as liquid transport fuels.

4.2 What role do alternative fuels such as electricity, Liquid Petroleum Gas and biofuels have to play? What are the barriers and challenges to wide-scale uptake of alternatives to diesel and what could be done to help remove these issues?

Whilst electrification will ultimately transform the picture for cars and light commercial vehicles, decarbonising larger vehicles is a major challenge. There is currently a large gap in the electric vehicles market, specifically for vehicles bigger than a domestic car or small van. The development of high capacity batteries capable of delivering ranges acceptable to the average motorist has been slow, and no commercially viable alternatives currently exist for large, heavy vehicles, such as HGVs and buses, which require even greater ranges than cars in addition to providing an adequate payload.

HGVs especially are 'low hanging fruit' when it comes to reducing harmful vehicular emissions in the UK. Although they drive only 5% of vehicle miles travelled and constitute 2% of registered vehicles, they emit 16% of road transport greenhouse gas emissions and 21% of NO_x emissions.

Additionally, whilst the Government and Mayor of London are seeking to make Euro VI engines the standard for low emission diesel vehicles as part of their plans for air quality, gas-powered Euro VI engines deliver far greater emissions reductions.

Camden House, Warwick Road, Kenilworth,
Warwickshire, CV8 1TH
T: +44 (0)1926 513777 F: +44 (0)1926 511923
E: mail@ngvnetwork.co.uk
W:www.ngvnetwork.co.uk

REA, 80 Strand, London, WC2R 0DT
T: +44 (0)20 7925 3581 F: +44 (0)20 7925 2715
W: www.r-e-a.net

The LowCVP[1] found that compared to even the newest diesel Euro VI HGVs, a gas-powered equivalent reduces NO_2 emissions by an impressive 74% over a variety of cycles, total NO_X emissions by 41% and particulate emissions by 96%. By looking at the entire picture, we can also identify significant CO_2 savings on a well-to-tank basis. This can be as much as 100 tonnes per vehicle if renewable biomethane is used. Running HGVs on natural gas gives around a 12-15% GHG saving according to the Element Energy study or according to the ETI study, the best case scenario indicates that the potential for emissions savings is very significant at 21-22% for LNG and 26-29% for CNG compared to the diesel reference. When running on biomethane, the Element Energy study quantified the savings at 84%. A recent study by Cadent[2] quantifies the theoretical potential for biomethane at over 100TWh per year, an amount which could cater for the entire HGV fleet.

These studies make up a convincing body of evidence about the GHG savings that could be made from encouraging the uptake of gas HGVs.

Gas HGVs are already being adopted by many of the UK's largest retailers such as Waitrose and Argos given their emissions reduction credentials combined with excellent driving cycle performance. Meanwhile, there is no credible all-electric alternative and this is unlikely within the next couple of decades. Infrastructure such as catenaries or inductive strips on the road, carry with it significant costs and disruption to other road users.

For levels of NO_2 in areas of high concentration in order to "reach legal compliance within the shortest time possible", the Government must implement robust action to sharply reduce the number of diesel vehicles, particularly in the heavier weight classes, driving in our towns and cities. The Government is right to be attentive to getting value for taxpayers' money, and so it must be acknowledged in plans to improve air quality that targeting certain types of vehicle will deliver a greater benefit in terms of reduced NO_2 emissions than focussing on others.

For lighter freight vehicles such as vans and taxis, Calor has rolled out a number of successful projects to demonstrate the value of switching to LPG. Independent testing of a TX4 taxi (a typical Black Cab) repowered to run on LPG revealed that after conversion the taxi emitted 99% less PM, 80% less NO_x, and 7% less CO_2. It also saved the taxi drivers money as LPG is approximately half the price of diesel. LPG recently benefited from having its fuel duty escalator removed at the recent budget, a signal that government sees a role for LPG in helping to clean up air quality in cities.

There has been plenty of investment in charging points for electric vehicles over the past 10 years, with much of this investment coming from the private sector. For example, many supermarkets, shopping centres and commercially-run car parks have incorporated charging points into newly-built sites. The small energy provider Ecotricity have installed over 300 of

[1] *Emissions Testing of Gas-Powered Commercial Vehicles*, Low CVP, January 2017.
[2] https://cadentgas.com/About-us/The-future-role-of-gas/Renewable-gas-potential

Camden House, Warwick Road, Kenilworth, Warwickshire, CV8 1TH
T: +44 (0)1926 513777 **F:** +44 (0)1926 511923
E: mail@ngvnetwork.co.uk
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REA, 80 Strand, London, WC2R 0DT
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their own charging points at numerous service stations and retail parks to form what they call their 'Electric Highway'.

Freight vehicles have not enjoyed the same level of subsidy and attention from policymakers. The Government's Industrial Strategy will need to interact with transport policy if it is going to truly support industrial growth; this will need to involve strategic investments in Britain's transport infrastructure.

As set out above, our members see gas-powered HGVs and buses as an immediately available and viable option for decarbonising freight transport and improving local air quality. However, widespread adoption of these vehicles will need to be backed up by a well-developed network of filling stations. This is entirely achievable and has been done in other European countries such as Germany and Italy which have 913 and 1,101 gas filling stations respectively, compared to under 20 in the UK.

The Government should be recognising the pressing need for cleaner alternatives for heavier vehicles that would not hamstring the freight industry's need for very long journeys. Just as charging points for electric cars receive subsidies and favourable legislation, so should equivalent infrastructure for gas HGVs and buses.

Therefore the principal barrier that we have identified is a lack of signal from government that gas-powered freight transport will be considered an integral power of the future freight transport system.

Investment in refuelling stations and vehicles for gas transportation will happen if companies can be confident that the government will not undermine it, for example by prematurely removing the duty differential. The industry is confident that the economic and greenhouse gas emission savings make it a suitable fuel for long-term investment, however it is wary that the future regulatory environment may act against it. Investor confidence would therefore be severely damaged by a change to fuel duty.

So far only a handful of environmentally and economically-savvy freight managers have begun to move to gas fuelling. Many more would be encouraged to do the same if the Government indicated its support.

5.4 How might regulations and physical infrastructure need to adapt to new technologies and business models in the freight sector?

There are a number of structural and regulatory barriers that need to be overcome in order to facilitate the development of gas vehicles. Currently, the technology for gas HGVs exists; however, manufacturers are not going to produce them in bulk until the demand exists. Once demand is sufficient, economies of scale in manufacturing will occur, bringing the cost down. Fleet managers are then not able to buy gas HGVs because they are not being made available. This initial 'chicken and egg' scenario needs government intervention to help remedy this.

Camden House, Warwick Road, Kenilworth, Warwickshire, CV8 1TH
T: +44 (0)1926 513777 **F:** +44 (0)1926 511923
E: mail@ngvnetwork.co.uk
W:www.ngvnetwork.co.uk

REA, 80 Strand, London, WC2R 0DT
T: +44 (0)20 7925 3581 **F:** +44 (0)20 7925 2715
W: www.r-e-a.net

We would like to the see the government develop policies to:

- Support the wider introduction of Clean Air Zones including at UK ports, in addition to those already suggested
- Encourage existing and planned congestion charging in low emission zones to treat NGVs in a similar way to other low emission technologies
- Allow night-time deliveries with quiet natural gas vehicles
- Promote a range of technologies for buses beyond hybrids
- Use fuel taxation to reflects the impact of fuels on the environment
- Promote alternative low emission vehicle bids in public tendering where economically-viable
- Implement the European Weights and Dimensions Directive, and to
- Develop a central plan to help developers and local authorities build natural gas filling stations, particularly for vehicles operating urban-drive cycles which contribute most to poor air quality.

<u>UPS Response to National Infrastructure Commission - Freight Consultation</u>

Background

UPS is one of the world's largest logistics companies, playing a vital role in the collection, warehousing and delivery of goods. Our UK operation includes more than 50 operating facilities, approximately 8,000 employees and a fleet of more than 2,200 vehicles. UPS provides critical national and international time sensitive delivery services for businesses of all sizes and the express sector contributed £2.3bn to UK GDP in 2010, and transports £11bn of UK exports a year.

Overview

Logistics and supply chains are essential to the growth of the UK economy. There are several areas that UPS considers to be key opportunities and issues related to infrastructure as we look ahead to 2050. These include investing in a free-flowing, high capacity road network system which will reduce congestion and carbon emissions, protecting air freight and freight companies' ability to fly at night ensuring UK's competitiveness in the global economy, supporting innovative ways of sustainable delivery and logistics and utilising technology to drive efficiencies in the supply chain.

1. **<u>What are the key constraints to the effective and efficient movement of freight in the UK and how do we overcome them?</u>**

1a. City Centre Access

We support in general the Government's Air Quality Plan have been working with local authorities to come up with innovative solutions to the carbon emissions issue (examples are detailed below). Our concern is that a number of cities now are looking at ways to improve air quality in urban areas and some of these may restrict access to freight in key city centre locations. As local authorities are developing plans independently, we would urge for some consistency in measures implemented and realistic timelines for freight companies to adapt their fleets and operations otherwise it may be difficult for companies who operate nationally to cope with multiple regulations across different cities.

1b. Aviation

Aviation is key to the supply chain, enabling UK businesses, especially in the hi-tech, retail, pharmaceutical and healthcare industries to send and receive just-in-time deliveries. Protecting air freight is critical to economic growth and keeping UK businesses competitive in a 24-hour global economy. UPS currently operates two air gateways in the UK from East Midlands Airport and Stansted. UPS would support greater usage of Stansted and East Midland airports for freight shipments and would urge that operators such as UPS are able to continue operating 24 hours a day. With customers requiring late afternoon collections and early morning deliveries, the only time we can move export and import shipments is by air and at night.

UPS Airlines strives to reduce its impact on the environment by operating the most fuel-efficient fleet in the package airline sector and aggressively managing aircraft and air hub operations. As the operator of one of the world's largest airlines, UPS also leads the industry in deploying noise and emission reduction technologies. UPS's strategy for purchasing aircraft focuses on managing operational costs and ensuring landing rights around the world by flying a quiet, fuel efficient and low emission fleet. All of the UPS air fleet is in full compliance with noise and emission reduction regulations established by the International Civil Aviation Organization (ICAO). All UPS's aircraft in Europe are 100% Chapter 4 compliant in regards to noise levels.

In summary, we would urge the continued recognition of the importance of air freight to the competiveness of UK business and recognise that the growth of the economy will be dependent on goods being flown overnight.

2. <u>How might the demand for freight develop and change over the next 20-30 years?</u>

For road freight, UPS has looked into different ways to use its vehicles more efficiently. This has been driven both by the rising price of fuel as well as a desire to reduce our impact on the environment. The growth of e-commerce in the UK (the UK has the third largest e-commerce market in the world) has also placed pressure on freight companies especially at key times of the year such as the run up to Christmas. This has also driven changes in the industry with the introduction of click and collect models, alternative delivery locations and new technology all with the aim to meet ever more demanding consumer expectations.

Aviation has also grown and changed over recent years. With ecommerce and cross border trade continuing to grow, air freight is even more essential to a global supply chain. Air freight (and more specifically the ability to fly at night) needs to be protected as more pressure is placed on airports to ensure the UK's economy can continue to grow and the just in time needs of key industries such as healthcare, high tech and retail are met.

3. <u>What effect does congestion have on the efficiency of freight movements and emissions?</u>

Congestion can have a huge impact on emissions. In general air pollutants will be worse when combined with high amounts of stationary traffic versus free flowing traffic. When vehicles are stuck in traffic this has the impact of releasing less displaced and more concentrated carbon particles.

UPS works to reduce these effects by efficient route planning and by using technology such as ORION (more on this below). A more efficient road network would help to reduce congestion and the resultant emissions that drive air quality issues in the UK.

4. <u>How can freight reduce its carbon and air quality impacts?</u>

4a. Commitment to Reducing Environmental Impact

We take our environmental footprint extremely seriously. We continually work to minimise the miles we travel and strive to increase the energy efficiency of our transportation network, regularly monitoring our carbon footprint and investing in low and zero carbon technologies such as electric vehicles and bio-methane HGVs. UPS currently operates a fleet of 52 electric vehicles (making us one of the largest single users of electric vehicles in central London), with plans for further investment.

UPS is also currently trialing an innovative 'depot-to-door' delivery system in central London. The *Low Impact City Logistics* project aims to reduce traffic congestion and emissions associated with urban package delivery by using a state-of-the-art power assisted delivery trailer. Packages are moved by electric assist trailers connected to bicycles, or used in walk mode, which feature patented technology, which means the weight of the parcels – up to 200 kilograms – is not felt by the handler. This allows for increased last mile deliveries in a sustainable manner which will reduce emissions and has the potential to remove vehicles from the road as well.

We also have a fleet of 19 dual-fuel liquefied bio-methane HGVs which can achieve a carbon saving of 25 per cent today, with further improvements expected over the coming years. We will be introducing range extended, electric vehicles into our fleet this year. These vehicles contain a small diesel engine which allows the vehicle to operate electrically over longer distances by re-charging via the diesel engine when needed. They are also geo-fenced so that they will automatically change to electric when entering a low emissions area or clean air zone.

4b. Electrifying the Fleet

At UPS, our goal has been to move towards electric vehicles in central London and potentially in other urban areas. Currently we operate 52 electric vehicles in our central London depot and have plans to expand this fleet. The challenge we have faced with expanding our electric fleet is in not having enough grid capacity for charging these vehicles simultaneously at peak times in the evening. It is not feasible to charge the vehicles during the day as they are on the streets carrying out multiple deliveries with only minimum time spent at each location. As a result, we worked closely with UK Power Networks (UKPN) and a three tier system of landlords to update the site's grid capacity at our Kentish Town depot, at considerable expense, and are now able to charge all the EVs at once, including during peak time. While this investment has been hugely successful, a recent report from FREVUE (a European project funded by the EU's Seventh Framework Programme for research, technological development and demonstration) highlighted the fact that UPS was required to make an investment in a UKPN asset without control over its operation.

For smaller businesses, this type of investment may be out of reach, which prohibits the uptake of electric vehicles. It is important that funding to be made available for the infrastructure allowing for simultaneous charging at night.

4c. SMART Grid Technology

In addition to the conventional grid upgrade that we undertook, UPS worked with a consortium to deploy a radical new technology solution with the potential to dramatically reduce the cost of recharging a fleet of electric vehicles.

Recharging a fleet of electric vehicles can be rendered cost-prohibitive by the need for expensive external power grid reinforcement work. To overcome this, the consortium, which comprises UPS, UK Power Networks and Cross River Partnership, has commissioned a combined smart-grid and energy storage system at the UPS operation in central London. The initiative was supported financially by the UK's Office for Low Emission Vehicles. It has had the immediate effect of raising the number of 6-7.5 tonne vehicles that can be recharged simultaneously overnight from the electricity power supply available at the site from 65 vehicles to the whole fleet of 170 vehicles without any further external grid reinforcement work.

Believed to be a world first example of operating live at this scale and combining both smart-grid and energy storage technologies, the intention of the consortium is to produce a strategy for how the solution could be used in other UPS facilities and beyond to electrify fleets cost-effectively. UPS believes the day is rapidly drawing closer when the cost of an urban distribution electric vehicle, including the necessary power supply investments, will be lower than that of its diesel counterpart. This breakthrough will be instrumental in enabling electric vehicles to be deployed in scale in the world's cities, itself an essential component of tackling the air quality challenges that those cities face.

In summary, it is our contention that a lack of grid capacity is preventing private companies from investing in electric vehicles, inhibiting the ability of cities to achieve its goal of cleaner and more sustainable vehicles. Take up of electric vehicles by the private sector is crucial to improving air quality in urban areas. For example, UPS's electric vehicles are significantly more carbon efficient than their diesel equivalent well to wheel. Replacing diesel vehicles with electric vehicles saves around 1.9 tonnes of CO2 and 181kg of NOx per vehicle per year. Therefore, UPS would like the government to consider how increased uptake of electric vehicles can be addressed, especially through addressing energy supply constraints either through investing in grid capacity and/or developing and deploying Smart grid technology which will allow the charging of vehicles overnight in a cost effective way.

4d. Innovation in Sustainable Delivery and Logistics

We also believe it is important to consider other innovative ways of ensuring the feasibility of sustainable delivery and logistics. In our current *Low Impact City Logistics* project in London, which utilizes an electrically powered bicycle and trailer, we are limited by the capacity of the trailers to carry enough packages to make the system viable. Our goal is to be able to place a large container in a “staging area” within central London that would allow the handler (or handlers) to continually refill the trailer throughout the day and carry out final mile deliveries. We have undertaken a similar project in Dublin, placing a container or “eco-hub” in a central location and allowing both walker and cyclists the ability to continually “refill” throughout the day and carry out deliveries in central Dublin. In London, we have been working with City of London to identify locations (mainly within underground car parks) in which we could place a container. In UPS’ experience, we have found that space being available for city centre container staging, e-tricycle parking and charging availability to support sustainable final mile deliveries, have all proven to be crucial in ensuring we can, on a practical level, carry out our operations in a sustainable manner.

4e. Biomethane Vehicles

UPS has a fleet of 19 dual-fuel liquefied methane-diesel HGVs operating out of Tamworth in the Midlands. We have installed a new liquefied methane fuelling station at Tamworth and we would like to use liquefied methane in its renewable form (biomethane) for maximum environmental gain compared to diesel. However, a shortage of supply is rendering this impossible for UPS and the industry, forcing us and others to use liquefied fossil methane (LNG) instead, with a much reduced environmental benefit.

- There are currently over 465,000 licensed HGVs on UK roads, which emit 21 million tonnes of CO2 per year. By the DfT’s own figures, this is estimated to account for 21% of domestic greenhouse gas emissions and 5% of all UK domestic greenhouse gas emission.
- Biomethane has the lowest carbon intensity of all road transport fuels. Few, if any, alternatives currently exist that can substantially reduce emissions in HGVs. Biomethane does not suffer from the same concerns over land use and sustainability of feedstock as other biofuels, as it is generated from existing waste.
- Defra standards show that biomethane emits 70% less carbon ‘well to wheel’ compared to an equivalent amount of diesel, and UPS’s trials have shown that when used in a dual-fuel HGV, a carbon saving of over 40% can be achieved. However, there is a chronic

shortage of biomethane supply in the UK in liquefied form, which is the form that many operators of HGVs on heavy or long distance routes require.

- Most biomethane in the UK is injected into the national grid and used for electricity and heat production due to the availability of more attractive subsidies. The transport sector only receives a subsidy on liquefied biomethane via Renewable Transport Fuel Certificates (RTFOs). In contrast, grid injected biomethane is eligible for financial incentives in the form of Feed in Tarrifs (FITs), Renewable Obligation Certificates (ROC), and Renewable Heath Incentives (RHI). This means that a unit of biomethane can attract between two and five times the financial subsidies if injected into the grid versus used in liquefied form by the transport sector.
- These incentives have been spearheaded by another Whitehall department, the Department for Energy and Climate Change which is keen to diversify the electricity production mix, however this approach produces an overwhelming commercial pull for suppliers so there is little left available for liquefaction for transport use.

UPS believes that the Government must level the playing field so that Government subsidies also support the transport sector. Removing this barrier will address the lack of supply of biomethane for transport use due to higher subsidies for grid injection.

5. How could new technologies increase the efficiency and productivity of UK freight?

UPS is interested in technology that increases safety and efficiency and which helps us improve customer service. Three areas that we are currently looking at are autonomous vehicles, vehicle platooning and drones.

5a. Autonomous Ground Vehicles

UPS is always planning for what's next. We think autonomous technologies have potential for the future, but it's too early to determine exactly how they will fit into our business or commit to any specific plans. Safety is of the utmost importance to UPS and we are investing in technology that provides UPS drivers with opportunities to increase the driver's visibility and the space surrounding their vehicle in constantly changing environments.

Self-driving vehicles create an unprecedented opportunity to shape urban mobility. This technology has a strong potential to reduce urban congestion by reducing vehicle needs for residents, businesses, commuters and tourists.

But we do not feel that self-driving vehicles completely eliminate the need for human drivers. Our drivers are the company's best ambassadors for our brand, and the embodiment of the customer experience we want to provide.

Many of the components needed to make a vehicle autonomous, particularly collision mitigation systems, are already being used in UPS vehicles on the roads today.

- Every new Class 8 tractor UPS is buying this year in the US has a full collision mitigation system.

- Modern collision mitigation systems are highly sophisticated. The fact that they are being used in autonomous vehicles shows the potential of how these systems can immediately reduce accidents.

5b. Vehicle platooning

Among other initiatives, the company believes vehicle platooning is a promising driver-assisted technology that needs to be further explored.

- UPS has a small ownership stake in Peloton Technology, a company that is working on commercial vehicle platooning software platforms.
- Peloton has had limited truck platooning test pilot operations to date, none has used UPS equipment or UPS personnel.
- Truck platooning has the potential to provide environmental benefits, reduce traffic congestions and boost efficiency in our network.

5c. Drones/Unmanned Autonomous Systems (UAS)

We look at a lot of technologies to create operational efficiencies and for capacity building purposes.

UPS believes there are promising potential uses for drones to create operational efficiencies within the logistics industry. UPS has been testing them inside our warehouses to check high storage racks to confirm stock, or available space, among other tasks. While the concept of commercial package delivery by drone may not be far away, enacting the appropriate regulations is complex. UPS is no stranger to automation and believes it has a place in our business. However, drones cannot ever replace our uniformed service providers, who offer a level of customer service and human interaction that consumers value, respect and trust. We see the possibility of drones and other automated system technologies being “driver helpers” that can contribute to their efficiency and safety on certain delivery routes.

Beyond package delivery, we believe autonomous technologies, including drones, can solve a critical need in humanitarian logistics and crisis response to overcome the difficulties of safely reaching people in need with medicine and life-saving supplies. In May 2016, UPS announced a partnership with GAVI and Zipline to deliver vaccines to remote locations in Rwanda.

6. **What international experiences can the UK learn from to improve freight and reduce its carbon footprint?**

Road Use Efficiency

In order to maintain an efficient operation and meet the needs of our customers who require early morning deliveries, it would be a challenge for us to restrict the times when our vehicles are on the road especially at peak times of the day (i.e. early morning). Our operations and route planning are driven by our customer's needs and a levy would not necessarily change our behaviour.

UPS has already implemented key technology called ORION (On-Road Integrated Optimization and Navigation) in the U.S. and is in the process of introducing this to Europe. ORION analyses deliveries for the day and identifies an optimised route. In the U.S. we have seen annual savings of:

- 100 million miles
- 100,000 CO^2 metric tons
- 10 million fuel gallons

Logistics Efficiency

As an organisation we are continually looking at ways to maximise our efficiencies in order to reduce costs, miles driven, emissions and deliver industry-leading service to our customers. As a result, we are already looking at ways to ensure our HGVs are full or generally looking at ways to maximise the loads carried on each journey. This makes sense from an operational and cost perspective and a change in the road levy would not change our procedures which are already looking to maximise efficiencies where possible.

For more information please contact:

[Name redacted]
[Job title redacted]
UPS UK, Ireland & Nordics District
Tel: [Telephone number redacted]
[Email address redacted]

1. What are the key constraints to the effective and efficient movement of freight in the UK and how do we overcome them?

1.1. What do you see as the key drivers to a successful freight system that is fit for the future?

The interim National Infrastructure Assessment recognised that safe, reliable and efficient infrastructure helps to underpin the economy and society, by supporting Britain's businesses and improving quality of life. The report highlighted congestion, capacity constraints and carbon as being key challenges that must be overcome to support economic growth. There is an important role for rail freight in addressing these three key challenges.

In 2006 Sir Rod Eddington's Transport Study recognised the need to make best use of existing networks. The study discussed a "sophisticated policy mix", that didn't favour one mode over another, as being required to get maximum value out of the network. In the context of long term infrastructure planning this report is still relevant today and Freightliner strongly believes that a successful freight system that is fit for the future is that one that seeks to leverage the strengths of each mode to maximise benefits and improve overall outcomes.

1.2. Which are the key freight corridors that matter the most? Where are the bottlenecks in the freight network, and what investments in upgrades could deliver the best value for money for freight efficiency and UK plc?

We support the approach by the NIC to consider the challenges posed by congestion and capacity on a corridor-by-corridor basis and not solely at a national level. Congestion needs to be looked at on a corridor-by-corridor level in order to understand the cross-modal options that deliver an optimised balance. There are many corridors where relatively small upgrades to the rail network could grow volumes sufficiently to negate the need for more costly upgrades to the parallel road network. It is unlikely that a one-size-fits-all solution will offer the best value and therefore a greater corridor-by-corridor approach could yield more positive outcomes.

Research by consultants from Metropolitan Transport Research Unit (MTRU) on behalf of the Campaign for Better Transport and sponsored by the Department for Transport, highlights the opportunities to relieve congestion on key road corridors[1]. The report examined the potential of increasing rail freight capacity along three heavily congested freight routes: the A14 between Felixstowe and the Midlands, the A34 from Southampton to the Midlands, and the M6 and M62 motorways.

The report highlighted how targeted upgrades of existing rail lines, running parallel to these major routes would allow large numbers of lorry loads to be transferred to rail. In many cases this modal shift would have a considerable impact in reducing congestion.

On the A34 route between Southampton and the West Midlands, one of the most congested roads in the country, with a poor accident record[2], increasing the rail mode share from 35% to 50% would result in two thousand lorry loads a day shifting to rail.

The ability for rail to dramatically reduce road congestion on some of the country's busiest roads highlights the need to holistically consider different modal interventions on a corridor-by-corridor basis when evaluating options to reduce congestion. Cross-modal assessments will help understand

1 http://www.bettertransport.org.uk/sites/default/files/research-files/cross-modal-freight-study.pdf
2 https://hansard.parliament.uk/Commons/2016-10-26/debates/F0B582CB-C642-4090-95F5-7B9972350634/A34Safety

the interventions that offer best value for money and are consistent with Government's strategic objectives. Adopting a localised perspective, and considering in detail the incremental cost of the investment against the productivity benefits that are unlocked, is required to deliver best value for money.

Strategic Freight Network

Network Rail's Long-Term Planning Process has identified a number of upgrades to the capacity and capability of the rail freight network. Historically such enhancements have been funded through the Government's Strategic Freight Network (SFN) fund, often with private third-party contribution. The fund is administered by Network Rail and its Steering Group has representatives from across the sector (including the Department for Transport) and the governance of the fund was recognised in the 2016 report by Dame Colette Bowe as an example of good industry practice.

Investments in the SFN fund, have delivered excellent value for money. Typical Benefit : Cost ratios achieved in the last control period and predicted this control period are between 4:1 and 8:1[3], which is based on existing methodologies that exclude the significant productivity benefits being included in the calculation. The existing network costs (developed over the last 150 years) are largely sunk so the incremental investment in the network has the opportunity to deliver significant value.

A good example is the investment in the last control period to gauge clear the line between Southampton and West Coast Main Line to allow worldwide standard 9'6" high containers to be transported on standard wagons. The £71 million project was funded via the SFN fund, with a contribution from the Port of Southampton[4.] The benefits of this investment were very quickly realised and within 12 months following the completion of the gauge clearance, rail's modal share to and from the port increased from 29 to 36%. The financial analysis for the project indicates that the £71m project as having a net present value of £376m[5].

Infrastructure upgrades

Network Rail has identified a number of priority upgrades to the Strategic Freight Network which would unlock some of the key pinch-points – see Table 1.

Some of these proposals build on enhancements that are currently being delivered in this control period (Control Period 5 2014-19). For instance Control Period 5 (CP5) will see the delivery of a loop on the Felixstowe branch line. Funded by the SFN fund, with a contribution from Hutchinson Ports, this scheme will enable an additional 10 freight paths per day to run to and from the UK's busiest container port by the end of 2019. This is a key investment that will unblock one of the key pinch-points on the network for rail freight.

Linked to this is the Felixstowe to West Midlands and the North scheme, which has been identified as a potential future enhancement (see Table 1 below). This enhancement will enable the full benefits of the enhancement on the Felixstowe branch to be delivered by increasing capacity on the cross-country route from Felixstowe to the West Midlands. This will enable additional freight traffic to operate out of the Port of Felixstowe, avoiding the need for these intermodal trains to be routed via London.

3 Network Rail Freight and National Passenger Operator draft Strategic Business Plan – December 2017
4 Increasing rail freight's modal share, Rail Technology Magazine, 2014
5 Increasing rail freight's modal share, Rail Technology Magazine, 2014

Table 1: Candidate Strategic Freight Network fund schemes for Control Period 6 (CP6)

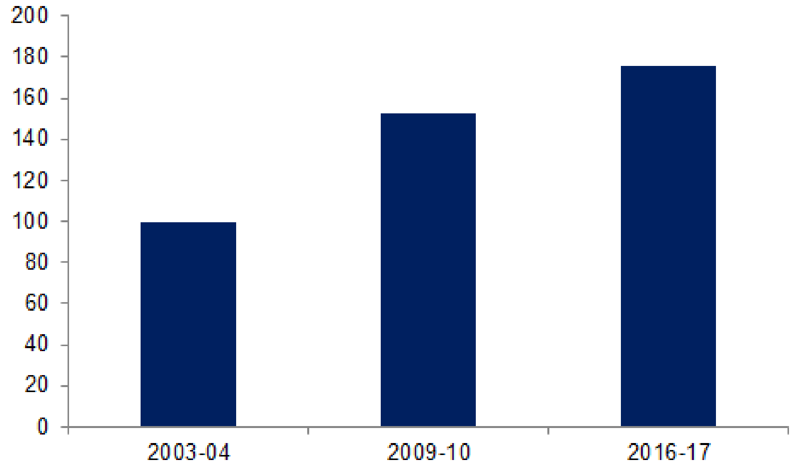
Key Freight Corridor	CP6 Candidate Freight Schemes	Estimated cost range	Output
Felixstowe to West Midlands & the North	- Doubling of Haugley Jn - Signalling Headways Bury - Ely area (level crossings / bridge speeds) - Ely to Soham doubling - Peterborough - Syston signalling/level crossings - Syston - Sheet Stores gauge (W10/W12) - Further refine layout at Ipswich Yard	£10m - £15m £50m - £70m £100m - £250m £120m - £150m £50m - £60m £5m - £10m £1m - £5m	Grow rail freight volumes from the Port of Felixstowe
Southampton to West Midlands & WCML	- Kenilworth doubling	£100m - £170m	Grow rail freight volumes from the Port of Southampton
Channel Tunnel classic route	- Gauge enhancement (up to W12)	£50m - £80m	Increase the capability of Channel Tunnel traffic
Cross-London, and Essex Thameside	- Ripple Lane Nodal Yard - Thameside Level Crossings (capacity)	£10m - £15m £30m - £40m	Grow rail freight volumes from London Gateway port
Northern Ports & Trans Pennine	- Trans Pennine gauge enhancement (up to W12) - New loop between Up Decoy and South Yorkshire Joint Line - Trans Pennine freight capacity	£100 - £200m £5m-£10m tbc	Increase the capacity and capability of rail freight across the Pennines and to and from the northern ports

Source: Network Rail Strategic Business Plan (Freight and National Passenger Operator Route)

Outputs of upgrades

The outputs of many of the SFN investments support an increase in the capability of freight trains on the network, rather than more freight trains. This includes investments to operate longer, heavier and larger gauge trains. Such schemes have contributed to a 30% reduction in the number of freight trains and an increase in tonnes moved per freight train of over 75% over the last 10 years. Longer and heavier freight trains have been a key driver in helping rail freight operators improve productivity and increase efficiency. See below graph.

Indexed net tonne kms per freight train

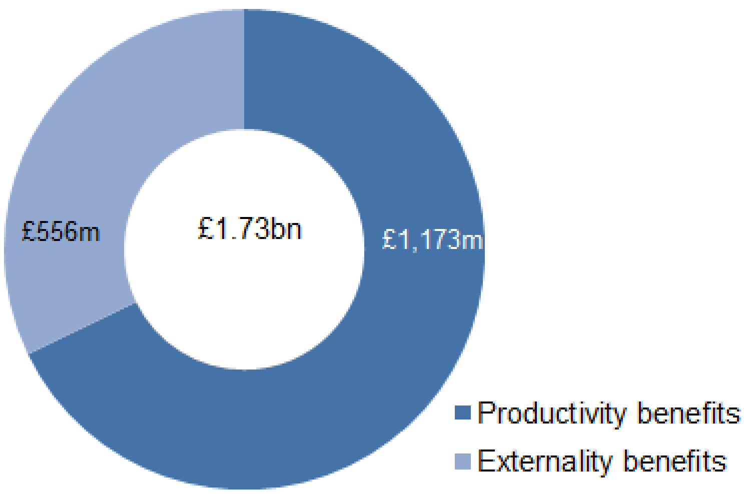


Source: ORR Data Set – Freight Moved and Freight Train Movements

1.3. To what extent are the economic benefits of freight factored into wider transport infrastructure investment planning?

The substantial economic benefits that rail freight delivers for the UK economy, demonstrates the key role that rail freight can play in supporting the productivity of Britain's businesses and generating externality benefits through lower road congestion and environmental gains. KPMG have estimated that for the calendar year 2016, rail freight delivered economic benefits totalling £1.73bn per year[6].

Economic benefits of rail freight



This includes productivity gains for British businesses of around £1.17bn and congestion and environmental benefits of £0.56bn.

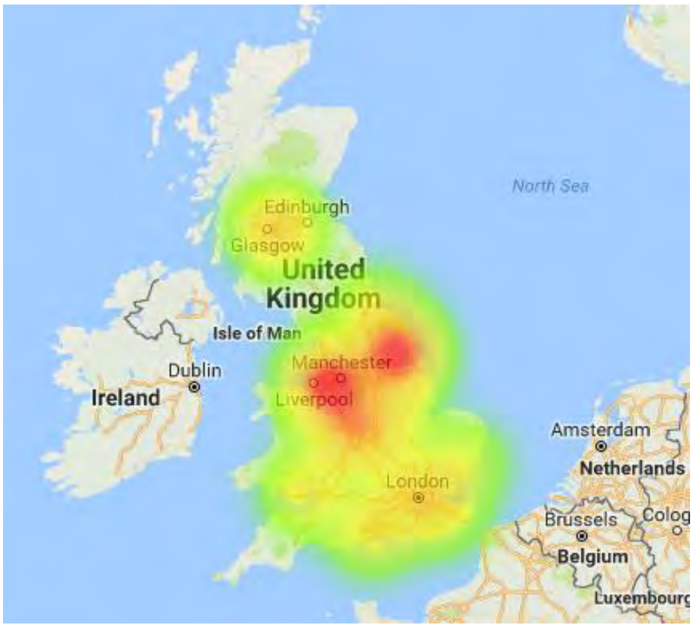
6 Rail freight in GB – productivity and other economic benefits, KPMG, 2018

Productivity gains

Rail freight makes a substantial contribution to the productivity of UK Plc by reducing the cost of transporting goods for Britain's businesses. These productivity gains help make Britain's businesses more competitive, which will be increasingly important as we seek to build new trading relationships with countries around the world.

The updated KPMG analysis now disaggregates the productivity and externality benefits to a regional level, to enable a better understanding of rail freight's role in supporting regional economies.

<u>Heat-map – Regional rail freight benefits</u>



The heat-map illustrates rail freight's role in supporting businesses around the country with the majority of the benefits accruing in four regions – North West, Yorkshire and the Humber, Scotland and the West Midlands. Together these regions accounted for nearly 60% of the total national productivity and externality benefits delivered by rail freight in 2016[7].

Factoring in productivity benefits

Despite rail freight generating significant productivity benefits for UK plc, guidance from HM Treasury to Central Government in the Green Book currently only allows externality benefits generated by rail freight to be considered, when evaluating the benefits of projects that support rail freight. Without considering the productivity benefits generated by rail freight, alongside the externality benefits, the holistic economic benefits of rail freight will not be fully factored into wider transport infrastructure investment planning. Given rail freight's role in supporting the productivity of Britain's businesses, we would welcome a change in policy whereby productivity benefits are factored into the evaluation methodology.

7 Rail freight in GB – productivity and other economic benefits, KPMG, 2018

Value of different capacity options

On an increasingly capacity constrained network it is important that the valuable capacity on the network is delivering highest economic benefit. Currently there is no mechanism to consider the economic value of different train services to understand the best use of capacity for UK plc.

Freightliner understands that Network Rail has aspirations to invest in its analytical capabilities as part of the development of the System Operator function at Network Rail. As capacity on the rail network becomes increasingly constrained, we very support investments by Network Rail that increase capabilities and enable trade-offs between capacity options to be robustly and transparently evaluated, so that the valuable network capacity is delivering the highest value.

1.4. What are the regulatory and legal issues that, if changed, could improve freight efficiency without increasing costs or reducing efficiency?

The Rail Delivery Group (RDG) report, Freight Britain, highlighted the importance of a stable and positive environment to promote private sector investment[8]. Key to providing stability is certainty in the long-term charging and regulatory regimes for access to and use of the national rail network that is owned by government and operated by Network Rail.

Currently the structure and level of track access charges is reviewed every five years. The five year regulatory cycle can create uncertainty for private sector investment and commitment by customers to changing mode. Investment in new facilities and plant by customers and freight operators typically have an asset life of over 20 years, so a 5-year charging cycle makes it difficult for businesses to commit to such investments. Stable and affordable access charges and incentives based on long-run efficient costs would provide additional confidence to the private sector to continue to invest in long-life assets to support growth and further improve the efficiency of rail freight.

This is an issue that was recognised in the Department for Transport's 2016 Rail Freight Strategy:

"We also recognise that, because track access charges are reviewed at each control period (set at every five years), this can make it difficult for the industry to plan ahead and take long-term investment decisions. Track access charges are linked to the costs of the network, which are reviewed every control period, and it is therefore difficult to provide visibility of the level of charges further ahead than this."

Providing longer term certainty on the level of track access charges (e.g. over at least 10 years – two control periods) would not necessarily increase costs to Government, but it would support the private sector in making investments in long-term assets that support growth and further improve the efficiency of rail freight. This would therefore lead to better value for money for Government.

How might the demand for freight develop and change over the next 20-30 years?

2.1 How has the demand for freight, and types of freight, changed over the last two decades, and what will be the drivers for changes in the future?

The shape of the rail freight market is changing. Since 2013/14, following the doubling of UK's top-up carbon tax and the parallel fall in gas prices, there has been a rapid decline in the demand for coal used to generate electricity. Previously the largest rail freight commodity, coal volumes moved by rail have dropped by 82% between 2013/14 and 2016/17.

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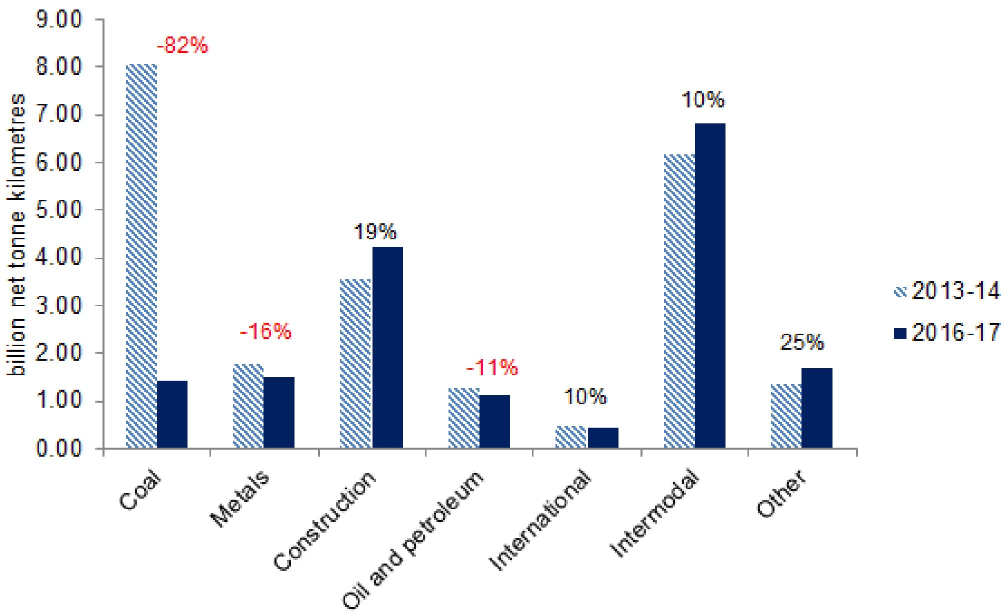
8 Freight Britain, Rail Delivery Group, 2015 https://www.raildeliverygroup.com/files/Publications/2015-02_freight_britain.pdf

In contrast there has been a continued and stable increase in the demand for the movement of intermodal containers and construction materials by rail (see below graph) and there are other new markets emerging. Together container and construction trains now account for nearly two-thirds of total rail freight volumes and the volumes transported by rail are at record highs.

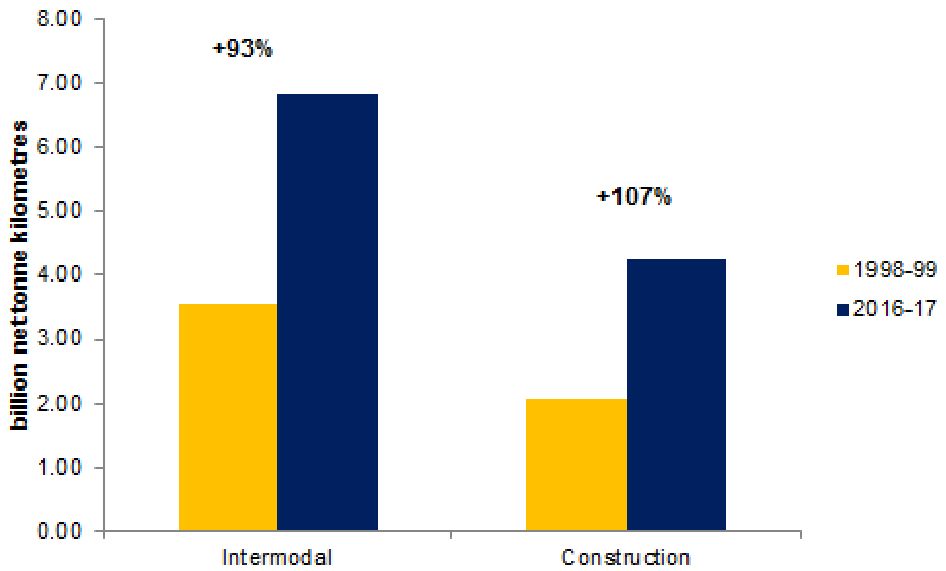
The significant structural reform following the sharp and sudden decline in coal volumes has created a financially challenging period of transition for freight operators. The operators have transformed and restructured their businesses to adjust to the new shape of the sector.

Freight moved by rail by commodity and change since 2013/14



The chart below shows growth in intermodal and construction volumes over the last 20 years. Intermodal volumes have nearly doubled over that timeframe and rail now moves around 30% of the containers that transit through the deep-sea ports. Construction volumes have more than doubled over this timeframe.

Change in freight moved since 1998/99



Intermodal sector

The growth in intermodal volumes is aligned to the continued trends in global containerised shipping, which has been crucial for the development of the global trade. As the demand for containerised freight continues to grow the industry expects continued growth in intermodal rail freight.

The impact of Brexit on the intermodal market remains unclear, however it is likely that were the UK to increase trade with countries outside the European Union there could be an increase in containerised freight into the UK container ports. This will lend itself to growth of intermodal rail volumes from the major deep-sea ports.

Currently most UK – EU trade is through the Channel Tunnel. Changes to trading relationships and customs arrangements may result in more container traffic being routed through the regional ports. The potential for more traffic to be routed through the regional ports provides an opportunity for rail freight to play a greater role in the onwards logistics chain than is currently the case.

The positive outlook for intermodal rail freight is further aided by "*a move towards "mega-vessels" and larger ships* [that] *is likely to favour rail given its strength in moving large volumes quickly*"[9].

Construction sector

The growth in construction volumes is aligned to the Government's commitment to invest in infrastructure that is fit for the future and is also driven by the need for large quantities of aggregates to move into urban areas to support house building, roads etc. The trend towards more super-quarries, for instance in the Peak District and the Mendips, and the importation of aggregates from overseas markets lends itself to the movement of this construction material by rail, which is more competitive against other modes when large quantities of freight are moved over longer distances.

Largescale infrastructure projects such as HS2, Crossrail 2, Heathrow third runway, Hinckley Point and Sizewell will challenge the ability to source sufficient aggregates material from within the UK. This will probably lead to more construction materials being imported from overseas markets through the regional ports around the UK, and create an opportunity for rail.

Rail is ultimately a better solution than road haulage for construction projects in and around urban areas. For instance the build of the southern end of HS2 into Euston would require an additional up to 800 two-leg HGV movements a day on the busy streets around Camden and north-west London, without the use of rail freight[10].

Growth forecasts

Industry growth forecasts suggest a positive outlook for the rail freight sector, although the rate of growth is largely dependent on the favourability of policies and support for different modes.

Network Rail is currently consulting on new rail freight forecasts out to 2024[11]. The forecasts, which have been developed by MDS Transmodal, consider a range of scenarios that assume various economic outlooks, different relative favourability of rail policies against road policiesand different assumptions around available rail capacity for growth. The overall growth forecast between 2016/17 and 2023/24 ranges between -9% and +49% (see below graph).

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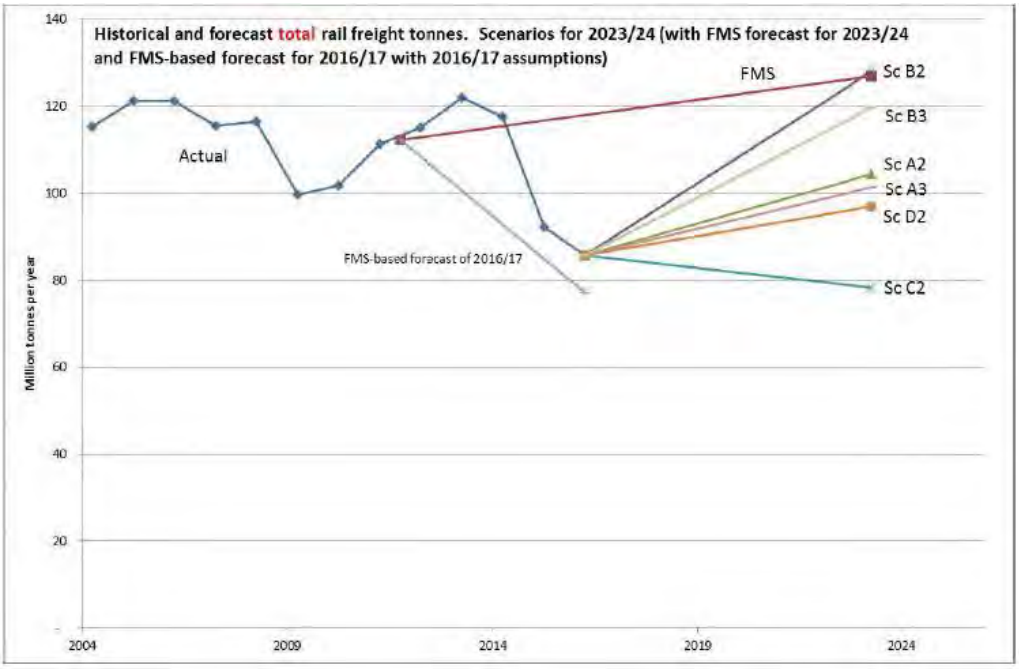
9 https://www.gov.uk/government/publications/rail-freight-transport
10 http://news.camden.gov.uk/hs2-rethink-folly-of-euston-urge-petitioning-camden-council/
11 http://www.mdst.co.uk/articles/pages/rail_freight_dec_17

Rail freight growth forecast



2.2 How is the freight industry planning for future changes in the demand? What levers might be available to shape future demand for freight transport?

Intermodal and construction are expected to remain the key growth sectors for rail freight. Both of these commodity groups compete intensely with road. This makes the relative favourability of road and rail policies a significant driver for the shape of the freight transport sector and the relative modal share of rail freight in the future. For example the low market growth scenario, where factors are favourable to rail relative to road, forecasts 22% growth whilst and the low market growth scenario where factors which disfavour rail relative to road forecasts a decline of 9%.

The marginal external costs imposed on society are far higher from road transport than rail transport. The average external cost imposed on society per tonne-km, in terms of congestion, pollution and safety is roughly four times higher for HGVs than for rail transport[12]. This has implications for the relative competitive position of the modes and the ability for rail to compete with road. A new charging regime for HGVs provides an opportunity to consider how HGV charges could be developed over time to reflect these external costs.

We note that the DfT is currently consulting on introducing distance based charges for lorries; we agree that it is sensible to start with road pricing in the freight sector. This could act as a helpful pilot, noting that the electrification of smaller vehicles will eventually mandate an alternative mechanism to capture revenue from road users. Introducing a distance based road charge for lorries could put road freight on a more similar footing to rail freight, which already pays a distance based charge. It would also support a tool that will enable future policy decisions on the appropriate charge for HGVs to pay to support policies on modal shift to rail and creating more efficient use of the road network.

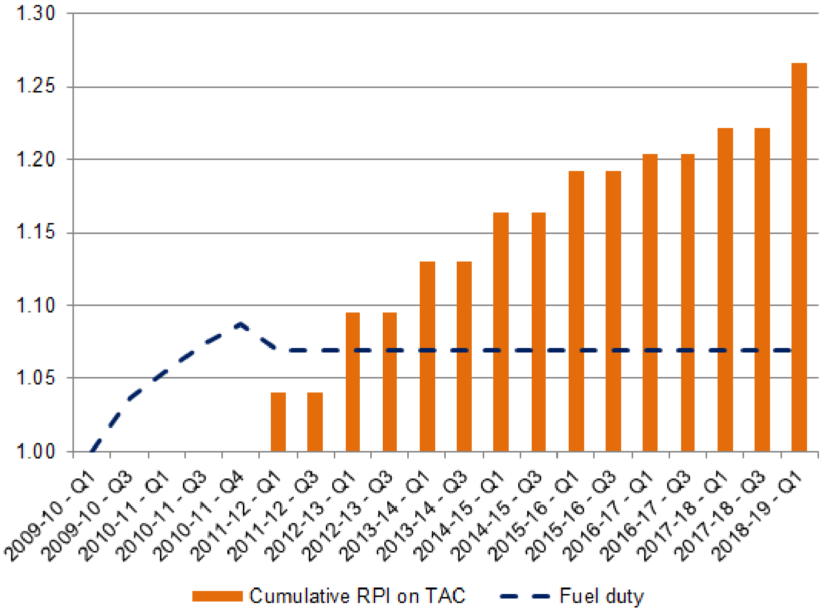
Albeit not an intention of recent fuel duty policy, the annual Retail Prices Index increases to track access charges paid by rail freight operators, but not by HGVs has had the impact of making it gradually harder for rail freight operators to compete with HGVs over this time period. See graph

12 External Costs of Transport, CE Delft, 2011 (http://ecocalc-test.ecotransit.org/CE_Delft_4215_External_Costs_of_Transport_in_Europe_def.pdf)

below, which shows changes to fuel duty levels and actual Retail Price Index increases applied to rail track access charges against a base of 1, since 2009.

Note: This chart excludes the change in track access charges as a result of the Periodic Review 2013, which was implemented from April 2014. By the end of Control Period 5 the resulting overall increase in track access charges paid will be a further 15%.

Chart 2: RPI on track access charges versus change in fuel duty



Source: Office for National Statistics and Network Rail - update

Mode Shift Revenue Support

The Mode Shift Revenue Support (MSRS) scheme has been a real success and a key driver for modal shift to rail. It is recognised in the DfT Rail Freight Strategy[13] as one of the key existing policies helping to support rail freight growth. The scheme supports modal shift to rail and offers very high value for money, typically in excess of 5:1, through the environmental and wider social benefits of reducing lorry journeys on Britain's roads.

The scheme recognises the unpaid external costs of road and the environmental benefits of reducing lorry movements. The scheme is targeted and efficient, as rates are not adjusted for inflation and it is perfectly risk-adjusted as it is paid only on actual traffic removed from roads, where rail is at a unit cost disadvantage to road.

An increase to the MSRS budget would be a positive policy lever that would make an important contribution to supporting modal shift to rail and deliver high value for money.

3. What effects does congestion have on the efficiency of freight movement and emissions?

3.1 How does congestion impact upon the productivity and economic contribution of freight? To what extent does congestion affect changes to mode, time or other freight choices?

The Department for Transport now estimates that congestion costs the UK economy around £4 billion per year[14]. Whilst now 12 years old, the 2006 Eddington report[15] included much research

13 https://www.gov.uk/government/publications/rail-freight-transport
14 Road works: The future of lane rental, Department for Transport, 2017

about the impacts of congestion on the economy. It noted that ½ to 1% of GDP growth per annum was being lost due to inefficient transport infrastructure in the UK and calculated that the cost of congestion in England could rise to £22 billion by 2025. There is evidence that congestion has been getting worse over recent years and the Commission suggests that the widespread adoption of electric vehicles could further exacerbate this issue by reducing the cost of travel. Furthermore, the report notes that congestion cannot simply be solved by building more roads, as that usually leads to road users changing journey patterns and the congestion quickly returning.

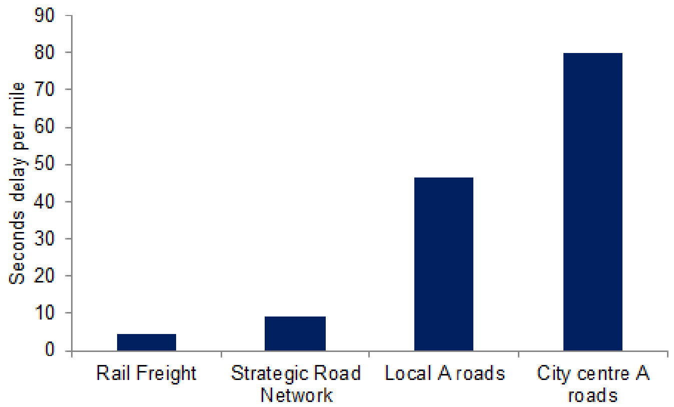
A growing body of research recognises the key role that rail freight can play in helping to tackle congestion. Details of the report prepared by consultants from Metropolitan Transport Research Unit (MTRU) on behalf of the Campaign for Better Transport and sponsored by the Department for Transport are described in response to question 1.2 above.

Reliability

Congestion is rightly identified as one of the UK's greatest challenges. It blights most of our cities and major urban areas where unplanned congestion causes delays to journeys. The increase in unplanned delays and corresponding increase in journey times makes our cities less attractive and our businesses less productive/competitive.

While unplanned delays, as a result of congestion, have a significant impact on the road network, this is a much smaller issue on the rail network. The following chart compares unplanned delays on the road network, including city centre 'A' roads, the Strategic Road Network and the national average, against unplanned delays of rail freight.

<u>Reliability of road and rail freight</u>



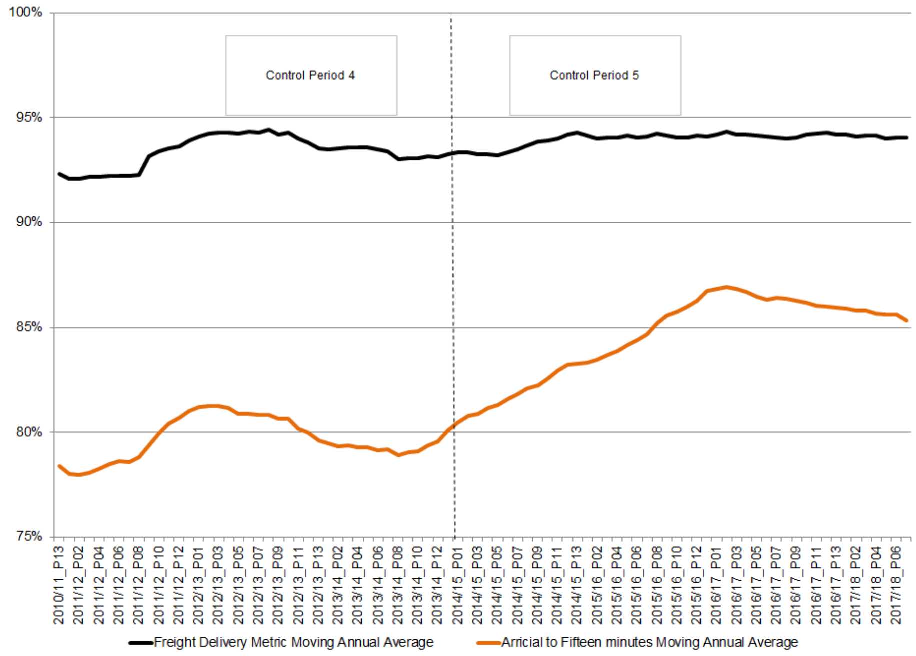
While unplanned delays affect both modes, rail continues to be a far more reliable mode than road. Average delay on the Strategic Road Network is now estimated to be 9.0 seconds per vehicle per mile[16], 46 seconds nationally and 80 seconds per mile on 'A' roads in city centres[17]. Conversely only 4.4 seconds of delay per mile were caused on average nationally to freight trains in the year ending March 2017[18].

15 http://webarchive.nationalarchives.gov.uk/20090115123503/http://www.dft.gov.uk/162259/187604/206711/executivesummary.pdf
16 Travel time measures for the Strategic Road Network, England: 2016, Department for Transport, 2017
17 Average delay on local 'A' roads: monthly and annual averages , Table CGN0502, 2017
18 Network Rail performance data

A key difference between the modes is that unlike road, rail freight is planned and timetabled with the assumption of no delay. This fundamentally makes rail a much more reliable mode and, provides greater certainty, enabling customers to plan their logistics chain with greater efficiency.

The rail freight operators and Network Rail have worked together to make significant improvements to performance over recent years. Over 85% of freight trains arrive within 15 minutes of their scheduled time and Network Rail continues to outperform its regulated freight performance target[19].

Arrival to Fifteen minutes and Freight Delivery Metric



Source: Network Rail data

Delays caused by freight operators to passenger operators represent about only 2.5% of total passenger train operator delay – adjusted for mileage changes, that represents a 20% improvement since 2014[20].

Average speed

The freight operators are working closely with Network Rail to increase the average speed of rail freight services. Despite most freight trains being capable of travelling at 60 or 75 mph, the average speed of freight services on the network is currently around 25mph[21]. This is largely the result of the timetabling process that sees freight trains frequently stopped in loops.

These inefficient paths represent a cost to freight operators and their customers and reduce the productivity of rail freight. In 2017 Transport Systems Catapult completed a research project for the Department for Transport to quantify the cost of these inefficient paths. They calculated that each minute of planned delay represents a cost of £3.30 for freight operators and £0.50 per minute for end users and eliminating this inefficient time from the schedules would be worth £22m per

19 Network Rail performance data
20 Network Rail performance data, 2017
21 Freight Network Study, Network Rail, 2017 https://www.networkrail.co.uk/running-the-railway/long-term-planning/

year to the sector. Faster paths would also help increase demand for rail freight. Eliminating inefficient time in freight schedules could increase demand for rail freight by an estimated 20%.

The industry increasingly recognises the importance of increasing the average speed of freight trains and Network Rail is working closely with the operators to improve outcomes in this area.

3.2 How does congestion affect the environmental impacts of the movement of freight?

Road vehicles contribute about 80% of NO_X pollution at the roadside. HGVs are responsible for 17% of total UK greenhouse gas emissions from road transport and around 21% of road transport NO_x emissions, while making up just 5% of vehicle miles[22]. As congestion increases it can be reasonably assumed that local NOx pollution around the area of congesion will also increase.

3.3 With limited space for new infrastructure, how can we better use our existing urban network to support freight? Are there changes – such as changes to modes, methods, or delivery times - that could help reduce the stress on the urban transport network?

It is important that the freight transport network is considered holistically and seeks to leverage the relative strength of each mode. A cross-modal perspective will allow for a "sophisticated policy mix” that doesn’t favour one mode over another and delivers maximum value out of the network – a network that has been developed over many decades.

While road and rail work in partnership, rail does have inherent advantages over road for certain freight flows. Rail has strong credentials for being able to move large volumes of freight over long distances and the rail network has been designed to enable this to be done efficiently. Lower gradients and reduced friction mean that it is a far more energy efficient transport network.

Platooning

Rail freight already provides the equivalent of a very long platoon. Each rail freight trains moves the equivalent of between 40-80 HGVs (depending on the commodity and the route) using just one locomotive.

Given the need for a sophisticated, multi-modal policy approach that seeks to leverage the inherent strengths of each to make best overall use of the transport network and deliver maximum value for money, Freightliner was disappointed that the recent interim National Infrastructure Assessment had such strong views on platooning as being a viable replacement for rail freight.

Notwithstanding the practical, operational and feasibility issues, platooning will not address the key infrastructure challenges, notably the capacity and congestion challenges. Should platoons of HGVs reduce the cost of road haulage it will likely worsen congestion by increasing HGV movements, leading to an increase in carbon emissions. Furthermore there are much wider implications for road safety, an important consideration given that lorries account for around 10% of all traffic accidents.

Professor Alan McKinnon identifies a number of practical and operational issues with platooning, which will likely be highlighted by the forthcoming trials[23]. His report identifies land and infrastructure investment as necessary to support the platoons being formed and detached, and notes that this will import additional costs by way of increased waiting times. While the interim report from the Commission highlighted the possibility for platoons to use the outside lane on motorways, it is unclear what this will do to the general traffic flow. The density of the UK road

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22 Department for Environment, Food and Rural Affairs, Department for Transport (2017), UK plan for tackling roadside nitrogen dioxide concentrations: An overview
23 Truck platooning – niche or norm?, Professor Alan McKinnon, 2016 (http://www.alanmckinnon.co.uk/blog/?p=70)

network and the close proximity of junctions, impacting how other users will be able to join and leave motorways, will all require further careful consideration.

In our response to the interim NIC report Freightliner suggested the need for further research on the practical viability of platooning is considered, alongside an assessment of the relative benefits of rail freight in terms of congestion relief, safety and environmental benefits.

4. How can freight lower its carbon and air quality impacts?

4.1 Are there efficiencies within freight management and distribution practices that could help reduce the CO2 and NOx emissions from freight?

Rail transport generally already has strong environmental credentials, and technical changes such as further electrification and digitalised signalling can further enhance these without any cultural changes by users. Consequently we urge the Commission to consider opportunities to better leverage the environmental credentials of rail freight to help tackle the challenges posed by carbon emissions and air quality. It was disappointing that the interim National Infrastructure Assessment focused exclusively on reducing pollution from existing road movements, as opposed to encouraging modal shift to more environmentally friendly modes.

Carbon reductions

The Commission acknowledges that to achieve the UK's target to reduce greenhouse gas emissions by at least 80% of 1990 levels by 2050, requires that nearly all road vehicles are electric or run on low carbon power or fuels. It is clear from the interim report that there is uncertainty over whether electricity will be able to fuel HGVs and therefore "biofuels or hydrogen may prove better options". The Commission acknowledges that there are other competing uses for these fuels, making it too early to draw conclusions on suitable future HGV fuel.

Future HGV fuel is a key consideration because HGVs are currently responsible for 17% of total UK greenhouse gas emissions and improvements in the efficiency of petrol and diesel vehicles will not be sufficient to reduce carbon emissions to the extent needed, according to the Committee on Climate Change. Rail freight already produces 76% less CO2 per tonne mile of freight moved, so even without further changes to rail (such as increased electrification), moving more freight by rail reduces CO2 by considerably more than the circa 10% savings from incremental changes to HGVs such as platooning.

Air pollution

Road transport also has a significant impact on air pollution and as a result continues to have a damaging impact on public health, with many areas of the UK in breach of EU pollution limits. Road vehicles contribute about 80% of nitrogen dioxide pollution at the roadside and HGVs are responsible for around 21% of road transport nitrogen dioxide emissions, despite making up just 5% of vehicle miles[24]. Road transport also emits high concentrations of dangerous airborne particulates, which have serious health impacts.

Even transformation to alternative fuels and electric vehicles will not be sufficient to eradicate all the impacts of these dangerous airborne particulates, as particulates not only arise from using diesel fuel but also from brake and tyre wear and road abrasion.

24 Department for Environment, Food and Rural Affairs, Department for Transport (2017), UK plan for tackling roadside nitrogen dioxide concentrations: An overview

Role for rail freight

Rail freight is fundamentally far more energy efficient than road freight ; a tonne of goods can travel 246 miles by rail as opposed to 88 miles by road on a gallon of fuel[25].

The railway system plays a vital role in helping to improve air quality in the UK and reducing greenhouse gas emissions. Nitrogen dioxide emissions from rail freight are relatively low (only around 2 per cent of total UK transport emissions come from all of rail, including passenger). It is recognised however that the methodology for measuring emissions from rail freight requires updating and the rail freight industry is working with consultants appointed by the National Atmospheric Emissions Inventory to undertake this work.

4.2. What role do alternative fuels such as electricity, Liquid Petroleum Gas and biofuels have to play?

Currently around 9% of rail freight tonne miles are moved using electric locomotives. Electric trains can virtually eliminate local air quality challenges. As more electricity is being generated by methods such as wind, solar and nuclear there are virtually no pollutants produced by generating electricity. Electrification can be delivered on rail far more easily than on the road network.

Electric trains have been running for over 100 years and trains with overhead wire systems since the 1950s; the technology is totally proven and there are no cultural changes required by users, unlike for electric cars. While electric technology is advancing for cars, current electric technology is not feasible for HGVs, as the batteries would weigh more than the payload of the lorry. Therefore different solutions are required to reduce carbon and emissions from the movement of freight.

The UK lags behind many other European countries in terms of the percentage of the rail network that is electrified. According to European statistics, there are 5,440 km of electrified rail network in the UK compared to over 41,000 km in Germany and 16,000 km in France[26].

Freightliner would support a long-term strategy of further electrification of the rail network, with priorities including Felixstowe to the West Coast Main Line, via Ipswich and Peterborough, and the branch line to London Gateway Port. A plan for a greater network of electrified routes would support future development of electric locomotive designs and future decisions on the purchase of electric locomotive fleets by rail freight operators at the time when the existing diesel fleet is life expired. In order for an increased electric fleet to be viable, any strategy must consider the diversionary routes available (so Network Rail can undertake engineering work) and connections to rail terminals (noting that the development of last mile diesel engines is part of a solution).

Of course any electrification strategy would also support the decarbonisation of, and elimination of localised pollution from the rail passenger services on that route, as well as for rail freight services. Financial support will be needed for research and design for new designs of electric locomotives suitable for use in the UK to enable the competitive rail freight sector to collaborate to prepare for future change. Following Jo Johnson MP’s speech of 12th February 2018, the rail freight industry will exploring the opportunity for such funding with the Minister.

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25 Freight on Rail, Useful facts and figures, http://www.freightonrail.org.uk/factsfigures.htm
26 Railway transport - length of electrified lines, by type of current, Eurostat, 2017 (http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=rail_if_electri&lang=en)

4.2 What are the barriers and challenges to wide-scale uptake of alternatives to diesel and what could be done to help remove these issues?

Investment in the rail network can be made incrementally on a line-by-line basis. It is acknowledged that there have been some cost and delivery challenges around recent electrification schemes on the rail network. This can at least in part be attributed to the large gap (around 20 years) between the current electrification programme and the previous electrification projects. Instead of halting the programme again, a rolling electrification programme with a clear pipeline, would support the retention of skills and know-how to ensure more efficient installation in future, and increase future value for money.

4.3. What technologies could best and most realistically be utilised to manage the carbon impacts of freight, both within urban areas and on longer strategic journeys?

Rail freight operators continue to strive to further improve their green credentials. Over recent years investments by freight operators a range of areas, including:

- Stop-start technology, to ensure that locomotives engines are turned off when not being used
- Driver advisory systems manage train services so that they do not stop unnecessarily – thereby reducing energy requirement
- Fuel additives have further reduced the impact of diesel locomotives

Furthermore investments to enable the operation of longer, heavier and larger gauge trains on the network has led to a 30% reduction in freight train movements over the last 10 years, despite significant increases in tonnage. This has helped improve the productivity of rail freight and has been an important driver of improved efficiency. Running fewer but longer trains also helps reduce overall carbon and NOx emissions per tonne of freight moved.

Continued investment from Government in the strategic freight network and a positive and stable environment that supports continued private sector investment will enable operators to make further investments to increase efficiency and improve rail freight's already strong environmental credentials.

5. How could new technologies be utilised to increase the efficiency and productivity of UK freight?

Digital Railway

There are opportunities for the railway to embrace and leverage the benefits of the rapid technological changes rapidly taking place.

Freight operators are working closely with Network Rail to deliver the Digital Railway and we welcome the recent announcement that freight locomotives will be fitted with ETCS equipment to support the rollout of digital signalling. Upgrading the railway to next generation technology has the potential to yield further capacity and performance gains, improving flexibility and providing better information for customers and ultimately reducing the cost of running the railway.

Opportunities for digital technology to increase capacity on some of the most congested lines were identified in the interim National Infrastructure Assessment. We welcome the Commission's view that the rollout of the Digital Railway schemes should be progressed where the case looks strongest based on the Strategic Outline Business Cases that have been developed.

As part of the Digital Railway programme, the deployment of Traffic Management across the network also provides an opportunity to improve performance and increase capacity, by being able to dynamically replan services on the network in times of perturbation.

Planning tools

Freightliner strongly believes that there are opportunities to embrace technology to improve the train planning process. The train planning process remains a very manual process, which can lead to inefficient paths and sub-optimal use of network capacity. Investments could be made in people and systems to automate the train planning process to ensure that a) we get maximum value out of the existing network, b) the train paths are as efficient as possible and c) the availability of capacity for new services is determined quickly.

By reducing the amount of time freight trains stop and start and using techniques that enable more constant speeds fuel consumption can be reduced.

Network Rail is already developing sophisticated train planning systems that can dynamically and optimally re-plan services across the network. Much of this technology is being developed to support the deployment of Traffic Management across Network Rail's Rail Operating Centres (ROCs). This will support the retiming of train schedules on a live basis following perturbation and communicate changes to the trains supporting smoother running trains and less stopping and starting.

The use of similar technology could be explored for the timetabling process to ensure that the valuable capacity across the railway network is being used optimally and/or that trains are timed to minimise energy consumption. Currently changes to timetables are made incrementally and therefore do not support this holistic optimisation.

6. Are there good examples internationally of freight systems, policy, infrastructure or technology development and implementation that the UK can learn from to increase freight efficiency and/or reduce the carbon and congestion impacts?

Policy measures

In 2016 the European Court of Auditors published a report about progress made and the competitiveness of the rail freight market in Europe[27]. They identified the level of track access charges in different Member States as being a key driver for the competitiveness of rail freight. Charges for accessing rail infrastructure can account for between 20% - 35% of the operational costs borne by rail freight operators and this they concluded, compares unfavourably to those for accessing roads.

While freight operators pay track access charges to access the rail network, "*trucks access road infrastructure at no cost except charges for toll roads or roads covered by a heavy vehicle fee…[and]…the use of tolls and vignettes is not mandatory in the EU.*"

Where there are balancing measures to improve the competitiveness of rail freight there have been some notable success stories in modal shift to rail. Austria and Switzerland have benefited from such balancing measures, with road traffic restrictions for lorries and subsidies for companies carrying out rail–road combined transport, resulting in improvements to rail's modal share. This will have a corresponding benefit on congestion levels and carbon emissions.

27 Rail freight transport in the EU: still not on the right track, European Court of Auditors, 2016

99 Bishopsgate
London
EC2M 3XD
United Kingdom
Tel +44 (0)20 7901 44 55
www.gazeley.com

Gazeley
a GLP company

NIC Freight Study

Gazeley are a leading developer, investor, owner and manager of prime logistics real estate in Western Europe. Our business is focused on France, Germany, Netherlands and the United Kingdom, the four strongest logistics markets in Europe. We have industry leading capabilities across the whole value chain including Investment, Development, Asset management and Leasing. We have a proven track record of delivering 8 million sq m of warehouse space to a cross-section of industry customers. Gazeley are also members and supporters of the Rail Freight Group.

In December 2017, we became part of GLP, a leading global provider of logistics solutions. Through its network of strategically-located properties and ecosystem partners, GLP offers both space and technology-led integrated solutions to drive value for its customers. The Company has dominant market positions across eight countries and is one of the world's largest real estate fund managers, managing over US$44 billion of assets under management and a global portfolio of 620 million square feet.

Gazeley together with Ashfield Land are currently promoting a strategic rail freight terminal (SRFI) at Rail Central, Northamptonshire. Rail Central is a proposal in the pre-application stage for a 7.4 million sq ft distribution and logistics development where the West Coast Main Line and Northampton Loop Line intersect, adjacent to the A43 and within two miles of the M1 (at Junction 15A). The project includes two intermodal terminals serving both traditional container freight as well as the fast-growing 'express freight' market through its unique location and access to two railway lines.

Gazeley is also seeking to expand Magna Park Lutterworth in Leicestershire and as part of the proposals a road-based, low to no carbon, rail freight shuttle to DIRFT is proposed. Gazeley recognises that 16% of HGV traffic from DIRFT railhead is destined for Magna Park. To this effect Magna Park despite not being physically rail connected Magna Park is serving as a rail 'satellite' to DIRFT. By providing a rail freight shuttle and freight holding area, the existing and future Magna Park occupiers will be encouraged to use rail where it complements their predominately road based distribution operations.

Gazeley welcomes the NIC's engagement in the Freight Study commissioned by the Chancellor. The resulting recommendations should be achieved without jeopardising the short term delivery of infrastructure projects currently underway or in the planning application phase. Gazeley advocates both road and rail based distribution and sees the need for both to provide choice and competition within the market place.

Carbon, Congestion and Capacity is the correct focus for the NIC study and railfreight has a significant contribution to make with all three. Mode shift to rail is probably the most effective way of decarbonising a supply chain (76% less carbon per tonne mile, even with diesel locos, much smaller still with electrics) and reducing the number of HGV's (and thus congestion & serious accidents) on key arteries - as is already evident on A14/A34/M1/M4 corridors from the ports and quarries, as well as in London, where approaching 50% of the capital's aggregates arrive by rail.

A genuinely Multimodal Approach is required - Government's Freight and Logistics strategy should not be almost entirely road-orientated, as has been the case in the past and could be inferred from the terms of reference for this study. Rail matters - it is a mainstream logistics option and is a major player in key markets, notably Consumer Goods and Construction. It is now far more than a 'bulk goods' niche player - consumer goods now account for 40% of all UK railfreight - and can play a much greater role in future. The key factor is rail-connected supply chain facilities and a planning regime that encourages their creation (see below).

Urban/Interurban Logistics - there is considerable focus on urban logistics, but it is essential that the NIC understands that supply chains that end in cities originate in other areas. Almost all are regional, most are national and many are global. There is a continuum from point of production (in the UK or abroad) to the point of consumption in UK cities. Inter-urban transport infrastructure is thus of crucial importance to the successful economic and social functioning of cities, as well as to the UK as a whole. We recommend that the NIC should place significantly more emphasis on these interurban links than was evident in the draft NIA. This applies to both road and rail infrastructure and to the intermodal facilities needed to achieve a lower carbon/lower emission supply chain to, and within, urban areas.

Technological Innovation - Significant social and technological research is needed before any decisions are taken on the future role of radical new technologies in the transport system. This should include understanding fully the implications of operating connected and autonomous vehicles – especially HGV's – on motorways and trunk roads, including the effects on safety, congestion and modal split. We do not agree with the NIA’s view that platooned lorries could largely replace rail freight and consider that this would have strongly adverse impacts on congestion, capacity and carbon emissions. Further, platooning of HGV's does not reduce the number of lorries required and is thus not a solution to congestion - it could make emissions worse if, by making road more competitive, it took traffic off rail.'

So, what does Rail Freight need to carry out this much greater role for UK plc?

Land use planning - many more modal transfer terminals are needed for both consumer goods and bulk materials, especially in or close to the main urban areas and in the established NDC and RDC clusters around the UK. Investment in rail terminals and Strategic Rail Freight Interchanges (SRFI's) is entirely private sector funded, without the need for taxpayer money: Government's role is to facilitate their creation via the planning system. Modal transfer facilities in an urban area need not sterilise valuable land as the air space above them can be used for other purposes, as has recently been done in Paris with a consumer goods terminal. A rail-served concrete plant at Paddington is largely covered by a bus garage and much more use can be made of this approach.

A Multimodal approach to Urban Logistics - emissions in city streets can be reduced considerably by using a multimodal supply chain approach. The limited range of electric HGV's (currently only c.100 km) means that battery technology will have to improve considerably to give a decent range without reducing payload to an unacceptable level. This problem can, however, be overcome if rail is used for the trunk haul, with electric trucks carrying out the final leg, using intermodal units (refrigerated where necessary for frozen/chilled products - such units are already in daily use) for ease of transfer between the two modes. This is much preferable to putting goods through a consolidation centre where goods are transferred from diesel trunk HGV's to small electric local vehicles, at substantial cost in terms of facilities and labour. There is also scope for using the main terminal stations at night, and possibly between the peaks, for roll cage traffic if road access for vans is retained/provided. Worth noting also that rail is not confined to long distance hauls and is, for example, used to move substantial amounts of construction materials over (very) short distances from Greenwich into Central London (Kings Cross and Battersea) and from the Peak District into Manchester.

Electrification - the UK lags way behind the rest of Europe in electric haulage of freight trains. However, almost 2/3rd of UK rail freight could be fairly readily converted to electric haulage, including virtually all intermodal and automotive trains, along with most construction services, if a little over 300 miles were electrified. This is mostly made up of sections between, or extensions to, already-electrified passenger routes - the one completely 'new' route would be Felixstowe to the West Midlands, connecting to both the ECML and WCML en route, which alone accounts for over half the 300 miles. In due course further 150 miles might be required as diversionary routes. A new breed of heavy-haul electric freight loco (with a fuel cell/battery 'last mile' capability) will be required to replace the current diesel fleet, which will be approaching the end of its life in c.15 years' time - design work on this should start now. In the shorter term, overhauling and restoring to service the existing pool of electric locos, plus taking into freight use those shortly to be displaced from passenger services, would probably be sufficient to handle approaching half the freight moved by rail in the UK, if the 300 or so miles were electrified and freight operating companies were incentivised to do so.

Bigger Trains - longer trains (minimum 750m, with a target of 1000m - France is experimenting with 1500m trains) and heavier trains (3500t minimum, with a target of 4000t) allow better use of capacity and make rail more efficient and thus more competitive. This can be achieved by progressively removing infrastructure constraints that limit train size and by the introduction of more powerful electric locos. The heaviest trains of aggregates and other bulk commodities will probably continue to operate mainly at night, away from passenger services, with the empty trains returning to the quarry etc. after the morning peak - at 75mph they are able to keep up with all but express passenger trains.

Easier connection into Network - a quicker and cheaper process of connecting into the national Network is required. One company alone has around 10 locations situated next to a railway line and could move an additional 1-2m tonnes p.a by rail if connections were available, but the costs and time of doing so are prohibitive under current arrangements. Digital railway should help, but this needs to be tested, and design/approvals timescales need to be considerably shortened.

End

ICE submission of evidence to the National Infrastructure Commission Freight Study Call for Evidence

Introduction

ICE welcomes the opportunity to respond to the NIC's Freight Study call for views. ICE's response considers the NIC's questions in the context of the potential benefits from and challenges to the deployment of HGV platooning on the UK strategic road network. It also sets out some issues for consideration.

NIC Questions

This response focuses specifically on questions 1, 4, 5 and 6.

1. What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?

Roads are the primary method of transporting freight within the UK. In 2015 just over three quarters (76%) of all goods moved were by road with the remainder by water (15%) and rail (9%).[1]

The UK strategic road network faces a range of challenges from traffic load, congestion, its relatively unplanned nature and resulting high transport emissions. Road freight is a factor in these challenges:

- In March 2016-2017 1.97bntonnes of goods were lifted by GB registered HGVs (up 17% on the previous year). These vehicles covered 19bn Km. (up 3% on previous year)[2]
- HGVs are currently estimated to account for around 17% of UK GHG emissions from road transport and around 21% of road transport NOx emissions, while making up just 5% of vehicle miles.[3]
- The UK ranked in the top ten most congested countries in the world, the third most congested in Europe behind Russia and Turkey.[4]
- Much of the UK's domestic road-freight originates in, and is destined for, the midlands and south of England, a high-density area.[5]

Reducing the volume and increasing the efficiency of road freight will be essential. 'HGV platooning' has been identified as a potential part of the solution to these challenges.

4. How can freight lower its carbon and air quality impacts?

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[1] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/627597/domestic-road-freight-statistics-2016.pdf
[2] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/651257/road-freight-stats-april-2016-to-march-2017.pdf
[3] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/590922/freight-carbon-review-2017.pdf
[4] http://inrix.com/press-releases/scorecard-2017-uk/
[5] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/627597/domestic-road-freight-statistics-2016.pdf

Referred to variously as ‘HGV’, ‘truck’ and ‘lorry’ platoons, these are convoys of up to 3 heavy goods vehicles, travelling close together, with acceleration and braking controlled by the lead vehicle and using smart technologies to mutually communicate. 3-vehicle platoons are in the region of 50m long.

A range of potential benefits from HGV platooning have been suggested:

- Lower fuel consumption and consequently lower fuel cost - HGVs drive closer together at a constant speed improving aerodynamics, with less braking and accelerating.
- Potential to reduce CO2 emissions by up to 10%.
- More efficient road use, reducing congestion (thus improving air quality), and optimising delivery of goods.[6]

5. How could new technologies be utilised to increase the efficiency and productivity of UK freight?

A range of potential benefits from HGV platooning have been suggested, as identified in our response to Q4, as well as the potential for increased driver productivity and increased road safety.

However, the UK strategic road network has grown gradually and organically over time. It has not been as heavily planned as in other countries and on key stretches is heavily loaded. It is interspersed with junctions and slip-roads, often quite close together. This automatically creates challenges for HGV platoon trails, identifying how to manage other vehicles’ access to the road. The perception of 50m HGV platoons as a long “road block” and the time needed to overtake (based on margin speeds) are significant issues.

This could be addressed by automated coupling/uncoupling of HGVs in the platoon to accommodate access from slip roads. Separation from other road-traffic has also been suggested, but it is as yet unclear what this might look like and what the economic implications might be. Its potential may be most fully realised in a Level 5 vehicle autonomy environment.[7]

The real-time data and computation requirements are complex. Factors such as vehicle type, weight of load, tyre type, and prevailing weather conditions all have a bearing upon the operation of the vehicles in the platoon. These will need to be factored in to the connectivity systems between vehicles in the platoon.[8] If realised, HGV platooning could enable a reduction in the potential for human error and thus increase road-safety.

Public acceptance is a challenge to the deployment of connected and autonomous vehicles and will be for HGV platooning too, partly because of how it is presented in the media. Improved public understanding and buy-in will be a factor in these technologies achieving roll-out. Government and industry will need to ‘bring the public with them’, gradually building trust through transparency and open debate.

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[6] http://www.acea.be/news/article/what-are-the-benefits-of-truck-platooning

[7] Level 0 meaning ‘no autonomy and driver human controlled’ and Level 5 meaning ‘full autonomy and no driver control’.

[8] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/637361/truck-platooning-uk-feasibility-study.pdf

6. Are there good examples internationally of freight systems, policy, infrastructure or technology development and implementation that the UK can learn from to increase freight efficiency and/or reduce the carbon and congestion impacts?

A European Truck Platooning Challenge was initiated in 2016 by the Dutch Ministry of Infrastructure and the Environment, the Directorate General Rijkswaterstaat, the Netherlands Vehicle Authority (RDW) and the Conference of European Directors of Roads (CEDR).[9] In 2016, 6 platoons of connected trucks completed the first cross-border trial, travelling to Rotterdam from several locations, including Sweden. [10]

In the USA, several automotive industry players have made proposals to test platooning technology on US roads.[11] Japan is also commencing testing, primarily to address an increasingly pressing driver shortage.[12]

The impacts on existing road surfaces and linear structures (bridges) from HGV platoons requires consideration, and current 'road-trains' in Australia/USA may provide some useful data.

Other Comments

A number of other issues will require consideration:

- How will HGV platoons impact upon a) existing infrastructure, and b) design-requirements for future infrastructure? E.g. will our assumptions about the vibration impacts on bridges, or road-surface deterioration rates, have to change?
- Will HGV platoons be consistent with efforts to reduce congestion and the load factor of the UK strategic road network? How does it fit with the wider modal-shift agenda?

About ICE

Established in 1818 and with over 91,000 members worldwide, ICE is a leading source of expertise in infrastructure and engineering policy and is widely seen as the independent voice of infrastructure. ICE provides advice to all political parties and works with industry to ensure that civil engineering and construction remain major contributors to the UK economy.

For more information please contact:
[Name redacted], [Job title redacted]
[Email address redacted]
[Phone number redacted]
ice.org.uk

[9] https://eutruckplatooning.com/About+us/default.aspx
[10] https://www.theguardian.com/technology/2016/apr/07/convoy-self-driving-trucks-completes-first-european-cross-border-trip
[11] https://uk.reuters.com/article/us-daimler-usa/daimler-to-test-truck-platooning-technology-on-u-s-roads-idUKKCN1C027D
[12] http://www.truckinginfo.com/channel/equipment/news/story/2018/01/fuso-begins-truck-platooning-tests-in-japan.aspx

National Infrastructure Commission

Freight Study Call for Evidence

Network Rail Written Evidence

March 2018

Key points

1. Rail plays a crucial role in key freight sectors in the UK.

2. It brings huge benefits - 2018 KPMG analysis showed rail freight delivered economic benefits of £1.73bn including £1.1bn in productivity benefits and £0.56bn in externality benefit. Notably, the congestion & environmental impacts of road freight typically not being factored into end users modal choice decisions.

3. It generates 76% less CO2 than road per tonne mile and there is the potential for rail freight to further improve its efficiency and carbon performance.

4. Investments in rail network freight capacity and capability enhancements can have excellent business cases, based on congestion and environmental impacts alone, even without taking benefits to end users into account.

5. Rail freight plays a key role in urban freight distribution and addressing the clean air agenda.

6. Rail freight expects to innovate and increase its efficiency over the coming years by exploiting opportunities such as the Digital Railway, increased electrification and emerging technologies to improve further its efficiency and environmental benefits.

7. It is important that end users are able to transparently compare and determine the mode of freight transportation that is best for their market.

The role of rail freight

The freight and logistics sector is critically important to the competitiveness and growth of the UK economy with rail freight playing an important role within many sectors of the economy. The transportation of bulk goods remains a key strength while the burgeoning consumer goods market has driven significant growth in intermodal rail freight and modal shift from road.

Rail transported 18.9 billion tonne kilometres of freight in 2016/17, equating to 10% of freight surface transport.

Examples of how rail freight supports the UK economy include:

- Over 600 freight services operate every day on the national network

- 40% of construction sector traffic into London moves by rail.
- Between 30-40% of the containers that arrive or depart from the key deep-sea ports of Felixstowe, London Gateway and Southampton travel by rail.
- Rail now has a 10% market share of finished automotive export traffic.

This delivers a net external benefit of around £0.5bn per year (after taking into account the tax contribution made by lorries).

Nature and dynamics of rail freight

The UK freight market is fiercely competitive, both with road (which remains the price and service benchmark for most categories of rail freight) and within rail, with the five main Freight Operating Companies (FOC's) competing across the UK in all markets.

Each year the FOCs transport goods worth over £30bn – from groceries, which keep UK supermarkets stocked, fuel to generate electricity, steel and cement, to high-value export goods such as whiskies and cars. The key rail freight market sectors and their relative scale are summarised in the following table.

Market Sector	%	Rail Freight Activity
Intermodal	38	Movement of containers from ports and between inland terminals
Construction	25	Movement of aggregates, cement and spoil for the Construction industry
Metals	9	Movement semi-finished steel between works and finished steel to consuming manufacturing or fabricating industries.
Coal	8	Movement to power stations for electricity generation and steel works for steel production
Oil & Petroleum	7	Movement of oil, petroleum and diesel to distribution terminals
International	3	Movements via the Channel Tunnel
Other (includes biomass)	10	e.g. Movements of biomass ,cars, military equipment, spent nuclear fuel

Source - ORR Freight Rail Usage – 2016/17 Q4 - June 2017

The market itself continues to undergo fundamental change, with the rail freight sector simultaneously managing sustained growth in sectors such as intermodal and construction whilst continuing to manage the reduction in coal volumes since 2014/15.

An example of the changing nature of rail freight is that in recent years most of the major supermarkets have started to utilise rail for trunk haul movements of goods from their national distribution centres to regional centres and even to store. The service and reliability standards required by the UK's major retailers have become the standard for rail freight to achieve and exceed.

Rail freight's use of the network is also changing, reflecting the new economic geography of the UK and the increasing importance of the retail sector. Rail freight is increasingly focussed on serving major cities and areas of population rather than traditional "heavy industrial" areas. This means increasing activity south and east of an imaginary "line" from the Humber to Liverpool, and means that rail freight services increasingly share key (and often constrained) infrastructure with intensive passenger services, which themselves are forecast to grow strongly over the next decade.

Benefits of rail freight

Rail freight is increasingly recognised by the UK and Scottish Governments, customers and society in general as an economically attractive and environmentally efficient form of transport.

- *Environmental*

  The 2016 DfT Rail Freight Strategy made clear the value Government sets on the role rail freight can play in achieving objectives such as the Fifth Carbon Budget, which aims to see a 57% reduction in emissions by 2032. As HGVs are responsible for some 17% of total UK transport emissions, the potential is clear.

  Each tonne of freight transported by rail reduces carbon emissions by 76 per cent compared to road, and each freight train removes between 43 and 76 HGVs from the roads.

  There may also be opportunities to further de-carbonise rail freight as only a small percentage of rail freight (around 5 per cent) is currently powered by electric traction. Increased use of electric traction for freight will be crucially dependent on the extent of electrification of the rail network.

- *Economic*

  The UK's rail freight sector plays a significant part role in keeping Britain's economy growing. Analysis by KPMG in 2015 estimated the benefits of rail freight to the UK economy at £1.6bn per year, including productivity gains for UK businesses, reduced road congestion and environmental benefits.

  The wider socio-economic benefits are well documented with each freight train removing up to 77 lorries from the nations congested road networks, indeed the rail freight sector is estimated by the ORR to remove 7.8 million Heavy Goods Vehicle (HGV) journeys and 1.7 billion HGV kilometres (kms) from the roads annually.

Network investment for rail freight

On the basis of the above economic and environmental benefits it is clear that the network capacity and capability needs of an evolving freight sector have a not dissimilar importance to those for a growing passenger sector.

Freight related rail infrastructure enhancement schemes require a business case and these business cases are based on the DfT's appraisal guidance, WebTAG. The main rail freight benefits captured in these appraisals are the congestion and environmental benefits associated with transferring freight from road to rail. Rail freight schemes funded by the Strategic Freight Network (SFN) fund generally require a Benefit Cost Ratio (BCR) of 1.5 and over recent years most SFN-funded schemes have demonstrated a BCR in excess of 2. A BCR in excess of 2 represents high value for money according to DfT criteria, so offering significant socio-economic and environmental benefits

Notably, however, these wider socio-economic benefits of modal shift do not typically feature in an end users decision on modal choice. The external costs of road freight (congestion, carbon, etc.) – and therefore the external benefits of rail freight – are not factored in to such decisions, users instead making their decisions purely on the comparative cost and service of road versus rail.

1. What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?

1.1. What do you see as the key drivers to a successful freight system that is fit for the future?

The success of the rail freight system is founded on its ability to operate in an operationally economic manner so as to deliver a service offer at least comparable to road in terms of price, reliability and transit time. This demands a rail network with appropriate traffic capacity (paths in the timetable where and when required) and capability (loading gauge and axle weight) and a suitable disposition of railheads and terminals to host such traffics.

1.2. Which are the key freight corridors that matter the most? Where are the bottlenecks in the freight network, and what investments in upgrades could deliver the best value for money for freight efficiency and UK plc?

As part of the long term planning process we have identified the following five traffic corridors, which represent the highest priorities for further capacity / capability enhancement so as to address current frustrated modal shift:

Corridor	Constraint
Haven Ports to Midlands and North West (cross-country)	**Capacity** constraints at Haughley, Ely, March, Peterborough, Leicester
Trans-Pennine	**Capability** constraints (loading gauge) and capacity constraints for East<>West coast traffics (M62 corridor)
Cross-London	**Capacity** pressures on freight routing to and through London with aspirations for increasing passenger service density

Solent to the Midlands & North West	**Capacity** limitations at Basingstoke
Channel Tunnel	**Capability** constraints (loading gauge)

1.3. To what extent are the economic benefits of freight factored into wider transport infrastructure investment planning?

All freight network investments are subject to a business case that factors in the socio-economic gain derived from modal shift from road to rail (as discussed above)

There is no recognition in enhancement investment decision criteria as yet of any economic efficiency gain in terms of rail offering a faster or more reliable rail transit or reductions in inventory cost.

1.4. What are the regulatory and legal issues that, if changed, could improve freight efficiency without increasing costs or reducing efficiency?

Stronger land use planning policy protection for current and potential rail freight sites. A specific priority for the construction sector is appropriate development control in urban areas adjacent to freight sites; residential encroachment can lead to the subsequent imposition of restrictions around operating times and such conditions can be at odds with the operational realities of railway i.e. no train movements pre-07:00 yet in most urban areas freight is timetabled so as to avoid morning passenger peak that starts at 07:00.

A derogation to permitted Gross Laden Weight (GLW) for those HGV movements involved in directly serving a multimodal journey – perhaps implementation of a 48t or even 50t GLW derogation vice the current universal 44t limit (itself formerly a derogation for exactly such movements).

Similarly, perhaps a red-diesel use dispensation for those HGV's operating in connection with a multimodal terminal facility and so part of a multi modal journey. With a suitably described maximum journey radius from the respective terminal, this would effectively mitigate costs associated with last mile road collection and delivery; making the radius area a virtual intermodal campus.

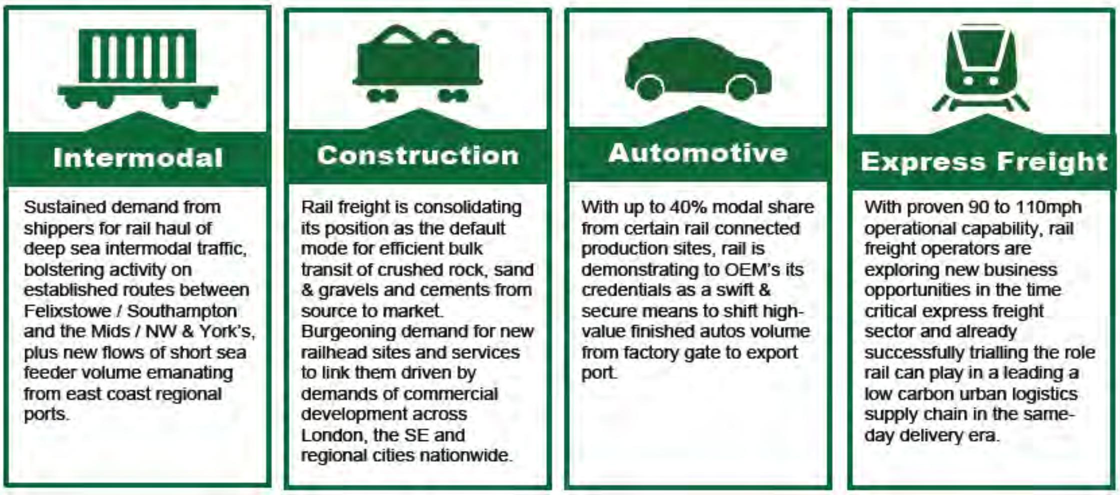
2. How might the demand for freight develop and change over the next 20-30 years?

2.1. How has the demand for freight and types of freight, changed over the last two decades, and what will be the drivers for changes in the future?

Over the last twenty years as a whole, the main features have been the rise and then fall of coal traffic and the sustained growth in the intermodal and construction materials sectors.

Over the past three years the rail freight sector has experienced a significant shift in the composition of its traffic base; with the simultaneous sharp decline in coal for power generation and steady growth in the maritime intermodal and construction sectors.

The graphic below summarises the nature of the 4 key sectors set for further future development:



Over the next decade we would expect to see:

- Further development in rail's share of the construction material market (bulk aggregates, cementitious materials, soils and spoils etc.); rail is the most economically effective way of addressing the geography of material demand (London and regional cities booming development needs) and the geology of material supply (a trend to larger super quarries at distance from urban centres and marine dredged sands and gravels), Such bread and butter demand will be supplemented by the significant material and spoil movement demands arising with the array of significant national infrastructure projects to be realised over this timeframe.

- Rail is strengthening its position as the default choice for volume consignments of finished autos for export (subject to rail connection of three of the UK's biggest automotive plants; Burnaston Toyota, Sunderland Nissan and Solihull JLR).

- Rail has an opportunity to make further inroads into domestic intermodal sector, acting as a trunk haul alternative for consumer goods distribution. With growth to date in part limited by the lack of available rail linked distribution facilities, the advent of the next wave of rail connected distribution site developments (Rossington (South Yorkshire) Four Ashes (West Midlands), East Midlands Gateway (East Midlands), Howbury Park (South East) will help generate new traffic opportunities.

- Urban Logistics; on the basis of recent trials at Euston station, there is a strong case for exploiting rail's Co2 credentials in a seismic change in urban logistics. Hi-speed electric rail into cities with electric onward local road distribution meeting the urban clean air challenge head on.

- The expansion beyond Royal Mail of Express Freight; use of high speed rail (perhaps cascaded repurposed passenger stock) for trunk haul distribution of higher value lighter weight consumer goods.

2.2. How is the freight industry planning for future changes in the demand? What levers might be available to shape future demand for freight transport?

The sector has responded with significant investment in rail terminals and rolling stock. In parallel the past two control periods have seen NR invest in freight related capacity and capability enhancement works under the auspices of the Strategic Freight Network programme.

We are currently in the process of updating our long-term rail freight forecasts. New forecasts have been developed and, following a consultation exercise, we are now reviewing responses from industry stakeholders. The main forecasts (in draft, subject to this consultation) show average annual growth of rail freight of c. 2% per annum between 2016/17 and 2023/24. This includes intermodal growth of c. 4% p.a. and c. 3% growth in the construction materials sector. This is offset by a forecast decline in ESI coal volumes. These figures refer to growth in tonne kms at the GB level and are based on the average of four scenarios, two of which favour the rail freight sector relative to the road sector and two of which favour road relative to rail. The forecasts are based on MDST's GB Freight Model.

3. What effects does congestion have on the efficiency of freight movement and emissions?

3.1. How does congestion impact upon the productivity and economic contribution of freight? To what extent does congestion affect changes to mode, time or other freight choices?

Network congestion in a rail scenario typically leads to a marginalisation of rail freight paths or significant line of route regulation that then suppresses velocity and so damages the economic viability of a rail service with excessive transit time consuming additional crew hours and upsetting efficient resource turnaround.

3.2. How does congestion affect the environmental impacts of the movement of freight?

Excessive regulation of freight services also leads to poorer per mile fuel consumption. Freight trains work best at a steady speed with modest power applications; continual stop and go regulation results in additional vehicle brake wear and locomotive fuel consumption increase.

3.3. With limited space for new infrastructure, how can we better use our existing urban network to support freight? Are there changes – such as changes to modes, methods, or delivery times - that could help reduce the stress on the urban transport network?

The NR freight and major stations estate has opportunities to deliver for a new urban logistics agenda, potentially:

- Vertical 'layering' or decking over existing bulk freight facilities to yield new urban distribution space with rail connectivity.
- Otherwise intensifying rail freight end user tenure and activity on existing freight sites to yield new co-located cross dock light freight terminals.
- 'Out of hours' use of our major stations to act as cross dock light freight stations.

4. How can freight lower its carbon and air quality impacts?

4.1. Are there efficiencies within freight management and distribution practices that could help reduce the CO_2 and NOx emissions from freight?

Simple measures such as installing automatic idle shut off controls on locomotives cuts unproductive fuel use and serves to reduce Co2 emissions of diesel locomotives.

Capability enhancements to our network that enable the operation of longer freight trains also effectively increase the productive payload per train, so enabling more tonnage to be conveyed per train with same locomotive and similar Co2 output per journey, in the same timetable path.

4.2. What role do alternative fuels such as electricity, Liquid Petroleum Gas and biofuels have to play? What are the barriers and challenges to wide-scale uptake of alternatives to diesel and what could be done to help remove these issues?

Greater reliance on a pure electric traction fleet would demand more extensive electrification of the network.

At present we are not aware of any UK trials but there is interest within the sector in application of advances made in the US for LPG as diesel fuel substitute for locomotives. Also, the recent advent of bi-mode freight traction (DRS's class 88) that can exploit existing electrified mainline network for trunk haul movements with an on-board last-mile diesel capability for positioning traffic at or within a terminal or local trip work.

The nationwide passenger rolling stock cascade may yet provide opportunities for the re-purposing of legacy electric traction displaced from current passenger operations offering a near term, relatively affordable, source of pure electric traction to augment existing fleets of similar vintage & design.

4.3. What technologies could best and most realistically be utilised to manage the carbon impacts of freight, both within urban areas and on longer strategic journeys?

Driver Advisory Systems have been trialled that see freight train drivers receive prompts from a mobile device concerning their adherence to the timetabled schedule for their train; advising whether to apply or reduce power; this with a view to optimising the trains progress within its path and minimise braking and acceleration – so optimising fuel use.

5. How could new technologies be utilised to increase the efficiency and productivity of UK freight?

5.1. How will new technologies change the capacity and performance of the freight transport network? Over what timeframes might these new technologies begin to affect the freight transport network?

Under the Digital Railway programme, intelligent traffic management systems should enable optimal pathing of freight services. It is vital that the systems algorithms are correctly parametised; critically that the actual braking capabilities of contemporary freight traffic are correctly understood (currently situation where traditional signal spacing and permitted running speed are defined by reference to braking capability tables predate many of the more modern freight vehicles in operation todays and are potentially overly conservative).

In-Cab based signalling systems could also make it cheaper to affect new connections from rail freight terminals to the existing network – obviating the need for costly mainline blockades for installation and commissioning. This would tackle a key cost hurdle in the realisation of a greater disposition of freight railheads to unlock potential modal shift.

Intelligent and situation adaptive traffic management systems could also be used to dynamically manage traffic flow and dwell at Nodal Yards; so more fully exploiting their value during periods of operational perturbation.

The development of a network of enhanced Super-Nodal Yards with the capacity to assemble paired services (so say 700m + 700m) with an intermediate locomotive working remotely as a slave unit to the manned, lead locomotive; could enable even greater volume to be conveyed per path on the mainline. Such a distributed power arrangement also ensures better tractive performance and quicker train brake release from a stand and so optimises on network performance of very long trains.

The locomotive control technology to support such operation is commonplace in the US, in the UK we do not currently have suitably configured nodal yard locations (albeit certain legacy yard sites like Bescot in the West Midlands and Eastleigh in the Solent already boast suitably extensive freehold footprints).

Innovative yet lower tech measures are also effective in further improving the efficiency of the contemporary rail freight offer:

- Exploiting the latent capability of existing freight traction to operating longer and heavier services in existing pathways on the network; in recent years NR and the FOC's have undertaken proof-through-trial instances that have typically reliably unlocked up to 10% uplift in per train trailing weights.

5.2. How can the use of data such as real-time traffic information by artificial intelligence and machine learning systems help to improve freight efficiency and productivity? How might this affect the business models and requirements of freight in the future? Are there any barriers to the greater use of data in freight?

5.3. How do you see technologies such as HGV platooning, digital railway signalling, and autonomous vehicles being integrated into freight distribution?

The fundamentally advantageous fuel efficiency of rail over road per tonne mile would still see rail maintain a similar Co2 advantage per tonne conveyed over road even in instances of HGV platooning.

The digital railway programme has recently seen Freight Operators, NR and system supplier reach commercial agreements for the first in class fitment of equipment to freight locomotives; a critical step in embedding rail freight at the forefront of the DR roll out programme.

5.4. How might regulations and physical infrastructure need to adapt to new technologies and business models in the freight sector?

As noted further above, the nationwide nature of freight traffic operations necessarily means that unlocking more widespread adoption of electric traction for rail freight haulage will be dependent upon electrification of a greater extent of the national rail network.

National Infrastructure Commission
Freight Study Call for Evidence

Consultation Response

Prepared on behalf of IM Properties Development Limited

March 2018

BARTON WILLMORE
PLANNING / DESIGN / DELIVERY

National Infrastructure Commission
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Checked by:	BT	BT
Authorised by:	BT	BT

Barton Willmore
9th Floor
Bank House
8 Cherry Street
Birmingham
B2 5AL

Tel: 0121 711 5151
Email: ben.taylor@bartonwillmore.co.uk

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APPENDICES

1.0 INTRODUCTION

1.1 We write on behalf of our Client, IM Properties Development Limited, to respond to the National Infrastructure Commission's (NIC's) Freight Study Call for Evidence (January 2018). IM Properties, as one of the UK's largest privately owned property groups, has a significant interest in freight and are well placed to respond to this important consultation given their extensive portfolio that spans industrial, retail, office and residential sectors.

1.2 IM Properties Development Limited recognise that the freight and logistics industry is a significant driver of economic growth and is of increasing importance to the UK economy. It is an enabler, underpinning all segments and makes both international trade and local deliveries possible. According to the Freight Transport Association (FTA) Logistics Report (2017)[1], there are 178,295 logistics enterprises in the UK. In terms of employment numbers, 2.54 million people work in logistics, which represents 8% of the UK workforce. The annual turnover for the UK logistics sector is £1 trillion and it contributes to over £124 billion Gross Value Added (GVA) to the UK economy, equating to 11% of the UK's non-financial business economy.

1.3 Continued growth in the freight sector in inevitable, not least due to improved fibre with geographical penetration and retail trends leading to increased online activity. In 2015, the British Property Federation (BPF)[2] estimated that the rate of employment growth in the sector (31%) is projected to exceed the national average (20%) between 2013 and 2035. Furthermore, the logistics sector's economic productivity is projected to grow by 83% between 2013 and 2035. This presents exciting career opportunities with positions in managerial, administrative and high-tech occupations including electrical and mechanical engineering and IT roles.

1.4 Whilst IM Properties Development Limited support the concept of Local Industrial Strategies set out in the Government's Industrial Strategy White Paper[3], in providing a framework for place-based economic growth, it is important that this does not preclude ad hoc opportunities for growth coming forward in alternative locations that provide for local needs.

1.5 IM Properties Development Limited welcome the opportunity to contribute to shaping future freight policy and guidance to maintain the sector's growth into the future, which is crucial to the UK's prosperity and global competitiveness. The subsequent sections of this Report are structured to provide a direct response to the six main questions as they appear sequentially in the Freight Study Call for Evidence document.

[1] Freight Transport Association (2017) Logistics Report 2017.
[2] British Property Federation (2015) Delivering the Goods.
[3] HM Government (2017) Industrial Strategy: Building a Britain Fit for the Future.

2.0 QUESTION 1

What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?

2.1 We set out below what we consider to be the key constraints to the effective and efficient movement of freight and some of the solutions to these issues.

Congestion

2.2 Congestion is problematic on key strategic routes for freight moved by road. Driven by population growth, urbanisation and new working and living demands, the network can be congested with cars. This is compromising the UK's cities and transport systems, as identified in the recent National Infrastructure Commission (NIC) Report[4]. There are several options available to improve movement of freight, or at the very least reduce the impact on the freight industry as set out below.

2.3 Reducing the amount of cars using the highway network would free up capacity for freight so improving the capacity and frequency of public transport would be a complementary objective. Similarly, a review of underused networks should be undertaken. For example, we question whether the M6 Toll could be nationalised to alleviate such capacity pressures on the adjoining network.

2.4 Rail freight can be a competitive alternative for the movement of some commodities on longer journeys. Indeed, Highways England[5] have identified an increasing interest in multi-modal facilities, such as the Daventry International Rail Freight Terminal, which are promoted through the National Policy Statement for National Networks (December 2014). Notwithstanding this, there are many impediments to delivery such as Green Belt, network challenges, costs and viability for operators. The NIC Report highlights total volumes of rail freight have remained broadly constant over the last 50 years, while volumes on the road have doubled. On Page 83, it highlights some of the issues associated with rail freight:

> "Rail freight is already increasingly limited by network capacity as passenger demand increases. The issues with mixed traffic on the network are well documented – freight trains travelling at 70mph on the same track as passenger trains travelling at 125mph results in a significant capacity constraint. Whilst freight can travel at

[4] National Infrastructure Commission (2017) Congestion, Capacity, Carbon: Priorities for National Infrastructure.
[5] Highways England (2017) Road to Growth

night in some areas, this competes with maintenance work, which also needs access to the track at night.

Reducing road freight by only one-third would require more than a three-fold increase in rail freight capacity, which simply could not be accommodated on today's already busy railway."

2.5 Another solution is offered by Urban Consolidation Centres that enable a number of individual deliveries from a variety of firms to be amalgamated into fewer vans on the edge of cities before being delivered in one consignment. This offers significant delivery streamlining for logistics companies; with reduced trips, reduced fuel costs and a corresponding reduction in associated emissions as well as improved vehicle capacity utilisation. According to a report produced by WRAP[6], Construction Consolidation Centres (CCC) have reduced freight traffic to construction sites by over 70%.

2.6 There is a need for land and infrastructure to support freight, such as lorry parks and associated facilities but this must be considered against the impacts of autonomous vehicles. It is recognised that this will involve wider stakeholder involvement from Highways England as well as potential cross-boundary support.

2.7 It is considered that every large conurbation should look to have a freight strategy that embodies the above considerations. Sustainable Urban Logistics Plans (SULPs) are an effective participatory and integrated approach for embedding logistics strategies into the overall urban mobility policy of a city. As defined in the EU-funded project ENCLOSE[7], SULP methodology provides cities with a method for analysing freight distribution processes, defining and choosing possible sustainable measures and services.

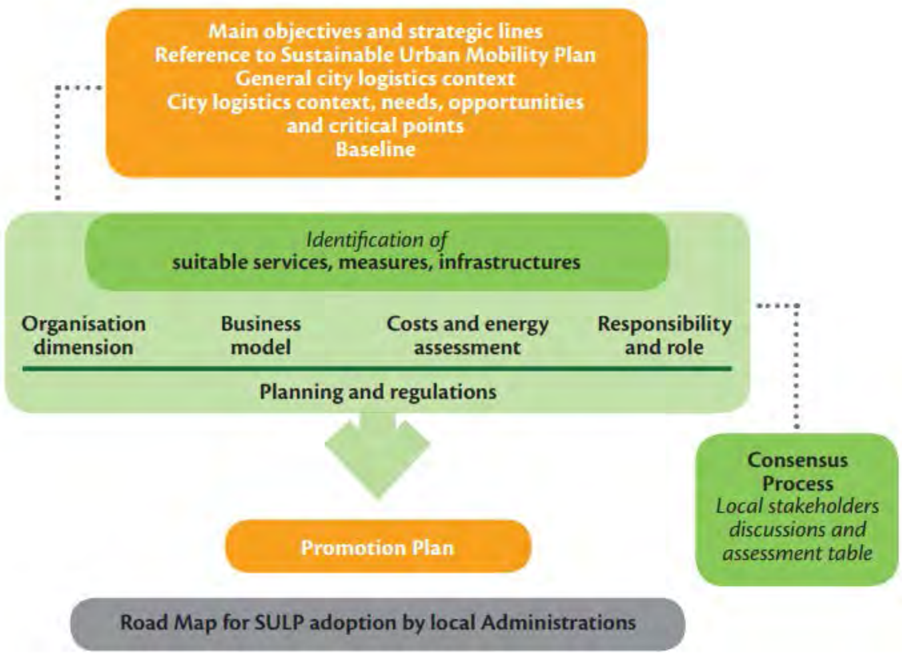
2.8 It comprises an 11 step methodology based on multi-stakeholder participation including political level involvement, but adopts a bottom-up approach, starting from user needs and requirements of operators. In the ENCLOSE project, the SULP methodology was implemented and tested in nine European cities and proved to be an effective tool to:

- Manage freight distribution processes;
- Define the common vision and priorities for stakeholders and identify the most suitable solutions and possible impacts; and
- Reach consensus on the possible set of solutions among public and private sectors in the logistics processes.

2.9 The early implementation of sustainable logistics measures in the nine ENCLOSE cities – such as electrified fleets and urban consolidation centres - led to decreases in individual cities of up

[6] WRAP (2011) Using Construction Consolidation Centres to reduce construction waste and carbon emissions.
[7] http://www.enclose.eu/content.php?p=home

to 2788 tonnes of CO_2 per annum. SULP methodology is being taken up by more and more cities across Europe as a way of improving air quality, reducing energy consumption and supporting business. The methodology is illustrated below.



Planning Policy

2.10 Ill-conceived and out-dated planning policy presents a significant constraint to freight. In December 2017, Savills reported that the take-up of industrial and logistics space by online retailers has grown by 731% since 2008, as occupiers continue to build their supply chains to keep up with consumer demand (Appendix 1). It is important that planning policy keeps apace with this rapidly evolving sector but is also resilient to future change.

2.11 The current guidance around economic development contained in the National Planning Policy Framework (NPPF) is broad and, whilst the section relating to 'building a strong, competitive economy' section advises that 'significant weight' should be placed on the need to support economic growth through the planning system, there are no policies relating specifically to freight. The forthcoming revisions to the NPPF and Planning Practice Guidance (PPG) present an opportunity to rectify this and ensure the needs of freight are recognised more widely.

2.12 At the local level, planning authorities need to ensure their development plan policies and supplementary planning guidance recognise the current and future operational requirements of the market. Policies relating to building height and scale, air quality (e.g. EV charging and Travel Plan requirements), sustainability and parking standards (allowing for shift overlap)

[8] http://www.enclose.eu/upload_en/file/deliverables/ENCLOSE_Publishable_report_D1_2.pdf

must provide a degree of flexibility to avoid being prohibitive or problematic. This also extends to decision takers in terms of ensuring planning obligations are reasonable and proportionate.

2.13 There are examples of bespoke policies relating to logistics, such as Policy 24 of the North Northamptonshire Joint Core Strategy (July 2016) (Appendix 2) and Policy EC2 of the North West Leicestershire Local Plan (Appendix 3), that are welcomed in terms of recognising the needs of the market subject to certain criteria being met. However, such policies are not commonplace.

Availability of Right Land in the Right Places

2.14 The significant shortage of strategic sites in key locations throughout the UK, such as the Midlands and South East, is a key constraint to the effective and efficient movement of freight. At the Industrial and Logistics Summit in November 2017, Estates Gazette reported only a 1.36 years' supply of available stock in the West Midlands and 1.86 years' supply in the South East, despite huge market demand. Accordingly, in its 2017 Manifesto, the United Kingdom Warehousing Association (UKWA) (Appendix 4) stated:

> "A key issue facing the UK warehousing sector is a lack of warehousing space currently available and the amount of land coming forward for new warehouse schemes. Under pressure to build more homes, local authorities are struggling to balance the needs of a land hungry logistics sector which will become even more important should Government ambitions be realised to build 240,000 homes per year".

2.15 Taking the West Midlands as an example, the West Midlands Land Commission (WMLC) highlighted the critical shortage of strategic employment sites in their Final Report[9] which stated, at Paragraph 5.20:

> "Ensuring a good supply of employment premises - in the right place, at the right price, at the right time and to the right specification – is essential to the growth of businesses in the West Midlands and the achievement of the employment targets in the SEP. Although in recent months much of the focus at regional and national level has been on housing, the evidence the Commission has seen suggests that the shortfall of land for employment space is at least as pressing as the shortage of land for new homes, and possibly more so."

[9] West Midlands Land Commission (2017) Final Report to the West Midlands Combined Authority Board.

2.16 Prime strategic logistics sites tend to be located on the edge of urban areas or in close proximity to motorway junctions meaning many fall within the Green Belt. As such, more and more developers and businesses are having to satisfy onerous planning tests (i.e. 'exceptional circumstances' or 'very special circumstances') to meet their growth ambitions. The slow pace of local plan preparation in many areas, as well as question marks over the effectiveness of the Duty to Co-operate to deal with 'larger than local' needs can make the former a frustrating process whereas the latter is uncertain and requires significant investment in resources. Consequently, according to Savills (Appendix 1), landlords and property developers are beginning to move away from what have traditionally been key industrial locations such as 'The Golden Triangle'. This could result in markets that are currently viewed as secondary becoming prime hotspots:

> "Moving forward however, a significant lack of supply, coupled with factors beyond the control of landlords and property developers – such as the availability of land, labour and energy provision – will mean markets that are currently viewed as secondary are set to become prime hotspots, particularly along the M5, A1 and A14 motorway corridors."

2.17 It is considered that local authorities should ensure that they have a robust and up-to-date evidence base as this is an essential part of the plan-making process and should underpin new policies. We consider local authorities should be obligated to undertake regular and robust employment land reviews. Since the 2004 Employment Land Reviews Guidance Note was cancelled and its contents (to an extent) brought into the Planning Practice Guidance (PPG), there have been concerns that the evidence bases used by local authorities in these decisions are often out of date. A lot of local authorities rely on employment land evidence which pre-dates the NPPF and is therefore unlikely to reflect the current economic situation and levels of commercial demand. There is no formal requirement for an annual update of employment land allocations, other than saying they should be 'regularly reviewed'. We would support stronger guidance that local authorities update these on a specific regular basis, and look more carefully at their future employment land provisions and the type of jobs that may be created by the various key sectors in the future to replicate what is done in respect of housing. Again, there is a window of opportunity to address this through the forthcoming changes to the NPPF.

Loss of Urban Employment Land

2.18 The rise of e-commerce and the need to satisfy consumers' increasing demands means sites with a 30 minute drive time access to inner cities are commercially attractive to urban logistics operators. As such, the loss of well-located, urban employment land to other uses, such as residential development, is a significant issue and has been accentuated by recent legislative changes (i.e. Permitted Development Rights allowing conversion from commercial uses to residential). The result is facilities are being developed in sub-optimal locations; pushed further away from the catchments they serve. This results in increasing costs, is less sustainable and operationally inefficient and accentuates the 'Three C's' identified in the NIC Report.

2.19 The above can be remedied through the protection of strategically-located employment land that enables the penetration of residential catchments. This can only be achieved if the right policy framework is provided. To that end, there are encouraging signs in the emerging London Plan[10] that the message is getting through to policy makers. The Draft London Plan seeks no net loss of industrial floorspace capacity (and operational yard space capacity) within Strategic Industrial Locations (SILs) and Locally Significant Industrial Sites (LSISs). The emerging policies advise that the retention and provision of additional industrial capacity should be prioritised in certain locations, including those that can accommodate urban logistics to support large-scale residential or mixed-use developments. The shift from land to floorspace allows any release of employment land to be compensated for through industrial intensification, co-location and substitution. Accordingly, draft Policy E7 (Appendix 5) provides detailed policy guidance on the measures that can be implemented to facilitate these processes and we are already seeing this take place in key locations.

2.20 We consider the principles the draft policy could be applied more widely to other Combined Authority Areas, such as the West Midlands and Greater Manchester, as they assist in maintaining a balance between housing and employment as well as recognising the operational requirements of urban logistics operators. Similarly, new large-scale masterplans should consider the incorporation of last mile solutions to serve the newly created residential areas given the rise in online retailing.

Lack of Strategic Planning Powers

2.21 Planning for future economic growth in a piecemeal manner, as opposed to a holistic approach, presents both a challenge and risk to the sector. Whilst the Government's Industrial Strategy[11] advocates Local Industrial Strategies that build on local strengths, this requires a spatial planning component that can be difficult to deliver due to local politics (e.g. where there are irreconcilable political differences over emotive issues, such as Green Belt release, between constituent local authorities within the same combined authority area). This precludes a joined-up approach involving the alignment of local economic objectives, land assembly and infrastructure investment to deliver cross boundary benefits. Clearly, this links back to the shortage of large strategic employment sites across the UK and difficulties in addressing 'larger than local' needs.

[10] Mayor of London (2017) The London Plan: Draft for Consultation.
[11] HM Government (2017) Industrial Strategy: Building a Britain Fit for the Future.

2.22 The above is evident in the West Midlands where the Mayor, Andy Street, has the task of implementing the West Midland's Industrial Strategy without the benefit of strategic planning powers. Planning remains under the control of the seven constituent local authorities. In Manchester, however, Andy Street's counterpart, Andy Burnham, does not have this issue as he does have spatial planning powers to allocate the land needed to implement his industrial strategy; reflected in the Greater Manchester Spatial Planning Framework.

2.23 A joined up approach is needed from the Government to ensure the needs of the freight sector are met and future investment is focussed in the right locations. Communication between policy makers, business representatives and other key stakeholders is vitally important to ensure strategic interventions secure the greatest return on investment (ROI).

Public and Political Perception

2.24 The public and political perception of the freight sector is considered to be another constraint. Often there are misplaced negative connotations relating to freight, including part-time employment, poor salaries and low skills linked to a poor understanding of the sector.

2.25 The BPF's 'Delivering the Goods' Report challenges the perceptions of the freight and logistics sector and identifies that only around 15% of employees in the sector work part-time, compared to an average of 32% nationally. Furthermore, part-time employment in the sector has been decreasing in comparison to the national level. The sector does, however, rely on a seasonal increase in employment to meet increased demand around the Black Friday and Christmas period. The BPF Report also notes that companies are keen to provide secure employment by reducing the use of agency staff and increasing the proportion of the workforce directly employed.

2.26 Contrary to the perception that salaries in the sector are low, the BPF Report makes reference to data from the Annual Survey of Hours and Earnings that identifies average salaries in the logistics sector (£28,000) are above the national average (£20,000). Furthermore, the average salary has grown at a higher rate (7%) from 2009-2014 than the national average (3%). Furthermore, average salaries in rail freight (£40,000) are especially notable compared to the national average. As the freight sector continues to grow alongside the growth of e-commerce, it is likely that the average salary in the sector will continue to increase. As such, the benefits that accrue need to be promoted to help overcome the negative perception of the sector.

2.27 The sector is often believed to only provide low skilled, elementary jobs. However, the BPF Report identifies that a wide range of jobs are supported in the sector. It offers positions in managerial, administrative and high tech occupations including electrical and mechanical engineering and IT roles. The sector has an above national average representation of managers, directors, senior officials and administrative and secretarial occupations, particularly in businesses operating freight terminals and cargo handling.

2.28 It is considered that the above negative perceptions of the sector could be resulting in a lack of young people seeking employment in the sector. The FTA Report[12] sets out the findings of the FTA Logistics Industry Survey and provides an annual review of the logistics sector. Respondents to the FTA Logistics Survey considered promoting the image of logistics to young people is an important aspect of continued growth in the sector. It is understood that the average HGV driver age continues to increase, which is a cause for concern in the future. Clearly, more needs to be done, including overturning negative perceptions, for the sector to appeal to the younger generation.

[12] Freight Transport Association (2017) Logistics Report 2017

3.0 QUESTION 2

How might the demand for freight develop and change over the next 20-30 years?

3.1 At the Industrial and Logistics Summit in November 2017, Estates Gazette advised that retailing accounted for 46% of take-up between 2016 and 2017. In December 2017, Savills (Appendix 6) advised the online behemoth, Amazon, alone acquired 4 million ft^2 in the UK in 2017: five times more space than its closest rival and the equivalent of 63 football pitches[13].

3.2 Growth in the sector shows no sign of slowing and it will continue into the future, driven by the growth in e-commerce and the rollout of superfast broadband. Accordingly, the Urban Logistics: The Ultimate Real Estate Challenge Report[14], states that there is an expected rise of 94% in online sales in Europe from 2016 to 2021. A 69% forecast increase in European parcel volumes is estimated over the same period. The Report states that London, which has a mature e-commerce market, has an urban logistics requirement of 870,000m^2 in 2017, expected to rise to over 1.2 million m^2 by 2021. Whilst this is a 43% increase, it is a much slower pace than in other European cities like Madrid and Barcelona, where the requirement is expected to grow by 102% over the same period.

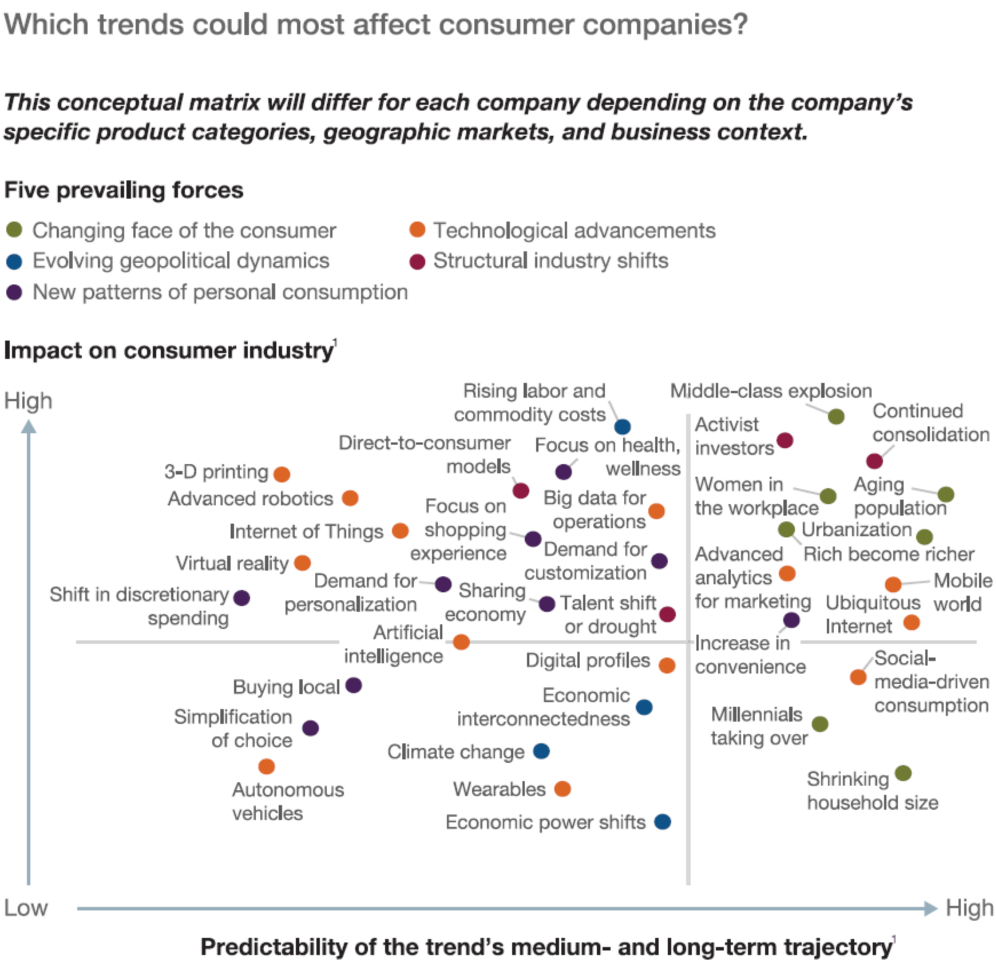
3.3 At the present time, we are uncertain on the impact that Brexit will have on freight. It is plausible that this will result in a switch of trading patterns from the EU to more distance sourcing and consumption markets will lengthen supply chains and increase the need for safety stock holdings to ensure continuity of supply. The UKWA Manifesto (Appendix 4) expects Brexit to increase the demand for warehousing, placing further pressure on land use and planning policy:

> "Whatever the eventual outcome of Brexit, a totally "frictionless" trade to and from Europe is not expected, and potential interruption in existing seamless logistics flows is likely to be mitigated by buffering of stock. A switch of trading patterns from EU to more distance sourcing and consumption markets will also lengthen supply chains and increase the need for safety stock holdings to ensure continuity of supply. It is expected therefore that Brexit will increase the demand for warehousing, placing further pressure on land use and planning policy. Some of the additional space required may be sought in or near to port locations, depending on the final arrangements for frontier declarations, inspections and security measures imposed on export and import freight."

[13] Daily Mail (26th December 2017) Amazon Fights for Warehouse Space as Retail Wars Heat Up.
[14] Cushman & Wakefield (2017) Urban Logistics: The Ultimate Real Estate Challenge.

3.4 The FTA Report[15] notes that the biggest concerns for the sector regarding future trading with the EU is tariffs on UK imports as well as additional red tape as a result of new customs procedures. Setting the conditions for investment in the movement of goods and services will be essential for a successful Brexit and imperative for the UK's future prosperity.

3.5 The continued growth in the sector will lead to a need for a diverse range of logistics facilities (big box logistics, dark stores, last mile, returns facilities, etc.) in differing locations with varied operating models and processes. The below graphic[16] shows trends that could affect consumerism and will impact upon freight and logistics. For example, 3D printing could have a high impact and, although printers are now available at a relatively affordable price, experts are divided on whether the hype surrounding this new technology will translate into widespread consumer adoption.



3.6 From an environmental perspective, ambitious targets have been set by the European Union, the Paris Agreement and others to speed up the transition towards low and zero emission

[15] Freight Transport Association (2017) Logistics Report 2017
[16] https://www.mckinsey.com/industries/consumer-packaged-goods/our-insights/the-consumer-sector-in-2030-trends-and-questions-to-consider?utm_source=linkedin&utm_medium=social&utm_content=Oktopost-linkedin&utm_campaign=Oktopost-118_GLB_Retail_MC_AO_RET_MSOL_SOC_1&nu_ref=Oktopost-linkedin

vehicles. The UK government has responded to this by planning to ban conventionally-fuelled cars by 2040. EU targets call for essentially CO_2-free movement of goods in major urban centres by 2030.

3.7 Whilst the UK will no longer be inside the EU, it is likely that, in order to advance trade and environmental protections, the UK will continue to adhere to many EU policies and standards. This means a likely acceleration towards low and zero emissions in the logistics sector; justifying greater learning from how other EU member states are pursuing these objectives.

3.8 One of the biggest structural changes the logistics industry must face, at least over the medium term, is the demise of petroleum-based fuels. That may be some time off, but it could well arrive in the form of ZEZs (zero emission zones) which will not be those one pays to access, but rather where no vehicle is permitted to access unless it is zero emitting.

3.9 Since there is no mass deployable electric option for freight as yet, EU plans for CO_2-free cities and towns seem very challenging. So one way could be through edge of town, shared logistics centres who have sole access rights to deliver within the 'virtual city walls'. And if this started to come about it would signal further significant structural change in the supply network.

3.10 Much of the UK logistics network is dominated by large private networks. It has evolved this way because the owners prefer to have control. That is because good supply chains provide a competitive advantage. But a shared edge of town last mile logistics strategy would significantly and structurally change the way the supply chain worked.

3.11 An edge of town approach could offer significant benefits. The shorter distances would facilitate a greater take up of electric power with centralised charging arrangements resulting in fewer HGVs and vans in town centres. But one major obstacle is the location of these centres. Their location will be very sensitive to the logistics 'centre of gravity' such that even small deviations could result in a new operation that was less efficient than the one before.

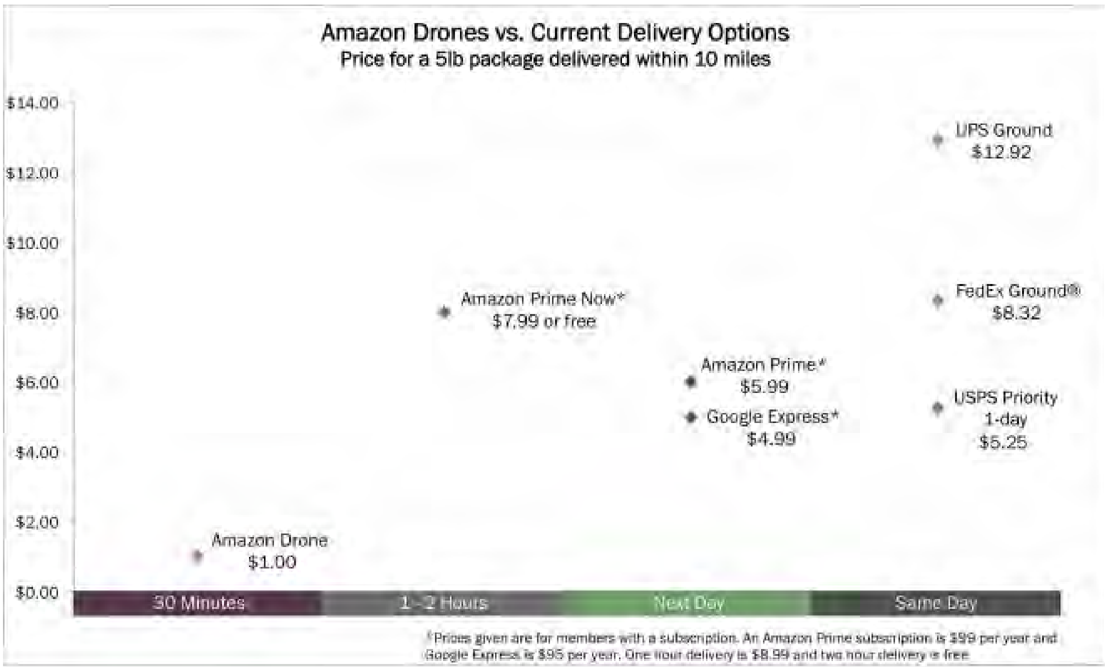
3.12 Thus, the reality is they are very likely to be needed in prime locations and this has significant implications for land use policy and will change the value equation of residential, retail and office versus B8 use. At present, any land for the former will attract much higher values so B8 uses will rarely be considered. There is also the issue of these centres operating 24/7, but if the vehicles are electric at least they will be silent.

3.13 As electric vehicle technology continues to improve, the question remains, are there sufficient raw materials to make enough batteries to replace conventionally-fuelled vehicles? There may be a need to consider alternatives (e.g. hydrogen).

3.14 The UK remains a leader in logistics at a global level and is ranked in the top 10 of the global logistics performance index of the World Bank for 2016. We set out below what we consider to be the key drivers to a successful freight system that is fit for the future.

Drones

3.15 Amazon founder and CEO Jeff Bezos has said that 86 percent of Amazon deliveries are under the 5-pound weight limit a commercial drone could reasonably carry.



3.16 Amazon Prime drones, will come down vertically from the air upon reaching their designated landing mat on the buyer's property. However, the argument against this is that many who live in built-up areas do not have access to a secure "landing place" for the drones.

3.17 Ground drones are also on the rise. Starship Technologies have launched a robot (on trial in the Royal Borough of Greenwich) designed to handle local deliveries of goods and groceries. The robot moves at a low speed and uses batteries, which means it is eco-friendly and frees up road space. Starship also claims the scheme costs between 10-15 times less than the cost of current last-mile delivery alternatives (using humans). 30-40% of the cost of delivery normally comes from the last mile.

3.18 Small robots are less expensive to build than trucks or drones, therefore Starship anticipates being able to offer them to local shopkeepers on a leased basis – essentially "robot-delivery-as-a-service". With a target delivery cost of £1 to £3 per delivery, the robots will allow these businesses, which have often been shut out of e-commerce by high delivery costs, to begin selling online.

Peer-to-peer package delivery (or "On-the-way" delivery)

3.19 This aims to take advantage of the cars already on the roads by allowing people to deliver packages to destinations on their route. Ride matching is done via mobility phone applications E.g. Roadie; Nimber; uDeliver.

Autonomous Trucks

3.20 The government has given the go-ahead for the first trials of convoys of semi-automated trucks on UK motorways. Up to three wirelessly connected HGVs will travel in convoy, with acceleration, braking and steering controlled by the lead vehicle, a concept named platooning. Each lorry will have a driver in the cab ready to retake control at any time.

3.21 Automated platooning helps trucks drive more efficiently and can cut their carbon dioxide emissions by ten per cent. Similar trials have been successfully carried out in the US and Europe. An EU challenge in 2016 saw platoons of connected trucks travelling from Germany, Sweden and Belgium converge in Rotterdam.

3.22 The impact of Autonomous vehicles needs to be considered further in the context of freight. It will result in increased efficiency in the delivery process and a reduction in the human workforce, thus removing driver restrictions. However, these issues could be replaced with battery technology limitations. Furthermore, regulatory environments are not currently in place in most countries and liability issues are still unclear.

4.0 QUESTION 3

What effects does congestion have on the efficiency of freight movements and emissions?

4.1 The FTA[17] reported that the UK is a global leader in logistics, ranking in the World Bank's top 10, but its supporting infrastructure has been identified as weak. World Economic Forum research shows that the UK consistently underperforms its major EU-27 competitors. The UK is currently ranked 27th for the quality of its roads, 19th for its rail infrastructure and 12th and 18th for ports and airports respectively.

4.2 The logistics sector relies upon the strategic road network to move 90% of its goods. The cost of urban deliveries is high, representing up to 50% or more of the total supply chain costs. However, congestion is increasing, particularly in and around major cities, adding cost and delays. It results in constant acceleration and braking of stop-and-go traffic which burns more gas and pumps more pollutants into the air. The FTA Report highlights the impacts of these stop-start movements:

> "According to information supplied to the FTA by manufacturers, a comparison of a HGV travelling at 30mph that stops 3 times in a mile and then gets back up to speed, and one that cruises at 30mph, shows a tripling of emissions".

4.3 The NIC[18] recently reported that in many UK cities there are congestion delays of more than 80 seconds per mile driven on city centre A Roads; which is problematic given that the cost of congestion for a HGV is calculated as £1 per minute. It is not surprising, therefore, that the total cumulative economic cost of congestion in the UK is estimated to be £307 billion from 2013 to 2030[19]. Consequently, a survey undertaken by CBI/AECOM in 2016[20] found that 73% of all businesses consider tackling congestion on the road network as either critical or important to the future of their business.

4.4 As stated under Question 1, making better use of underutilised parts of the network will assist in tackling the challenge of congestion. Similarly, mode shift including the use of barges on rivers and canals to transport goods, especially construction materials, is a way in which congestion on the road network can be alleviated. These have a much greater load capacity than lorries.

[17] Freight Transport Association (2017) Logistics Report 2017.
[18] National Infrastructure Commission (2017) Congestion, Capacity, Carbon: Priorities for National Infrastructure
[19] Centre for Economic and Business Research (2017) The Economic Effect of Road Investment.
[20] CBI/AECOM (2016) Thinking Globally Delivering Locally.

4.5 Germany has responded to the congestion challenge by developing the StreetScooter: a robust, simple electric vehicle used by Deutsche Post DHL Group. With expert insights from couriers, it has been designed to ensure efficient urban-based parcel delivery at a cost comparable to that of a non-electric van. One of the latest prototypes can hold 200 parcels and deliver them over a range of 80-200 kilometres on one charge. Similarly, mode changes, such as cycle logistics in the supply chain of DHL, UPS and TNT provides a quick and emission free solution that is more resilient to congestion. Again, this is something that should be introduced more widely in the UK given the concerns over congestion and air quality in urban areas.

4.6 Another solution to congestion is out of hours or re-timed deliveries. This has generally occurred where access to the receiving store delivery is either 24 hour or access can be achieved via a key or access code. The potential to re-time deliveries depends on a number of factors including access constraints, noise abatement linked to local residents, planning restrictions and delivery efficiency.

5.0 QUESTION 4

How can freight lower its carbon and air quality impacts?

5.1 There is a clearly a need to promote modal shift away from cars to sustainable modes of transport, including: public transport; walking and cycling to tackle air quality issues. There is potentially a role of express rail freight in delivering smaller, high value goods. There is also the possibility of using capacity on the passenger network out of hours or even extra carriages in peaks.

5.2 Policies relating to Ultra-low Emission Vehicles should recognise that diesel vehicles are unlikely to meet these standards and it is unrealistic to expect overnight changes to fleet emission standards; meaning there needs to be an allowance for an appropriate transitionary period to adapt vehicles and get the necessary supporting infrastructure in place. There is, therefore, a requirement for the sector to be consulted upon in the formulation of air quality management policies going forward.

5.3 Linked to the above, there is the need for clearer policy guidance and pre-application advice from local authorities so that operators have certainty over the levels of mitigation and/or contributions they will be required to provide as part of the delivery of their schemes.

5.4 A lot of operators are heavily reliant upon a fleet of HGVs and current technology is more feasible for the electrification of a fleet of LGVs rather than HGVs. Other issues associated with electric vehicles also makes it difficult for businesses to electrify their fleet. With regard to both electric delivery vehicles and alternative fuels for HGVs and LGVs, the availability of infrastructure at the end-destination, which may be subject to less stringent air quality policies, needs to be considered (i.e. to re-charge for the return journey). There is clearly an infrastructure challenge associated with geographic disparities.

5.5 There is a question mark over whether the technology will be in place to enable vehicles to be charged 'on the go' in the future. There is also a further question mark over the allocation and targeting of investment to enable the roll out of new technology so that new infrastructure is future-proofed as opposed to a more reactive approach that seek to ameliorate and repair the existing network without any consideration of future trends.

5.6 Set out below are examples of how freight can lower its carbon and air quality impacts.

Use of battery-electric tricycles and vans for retail distribution in London – Gnewt Cargo.

5.7 Electrically-assisted cargo tricycles and electric vans are used to deliver parcels from a small urban consolidation centre to customers in the centre of London. Electricity used to charge the vehicles is produced from renewable sources therefore offering a carbon free last mile solution.

Last mile deliveries are becoming mainstream but local authorities might be able to do more to make the environment more attractive such as the multi-use lanes seen in Barcelona (See Question 6 below).

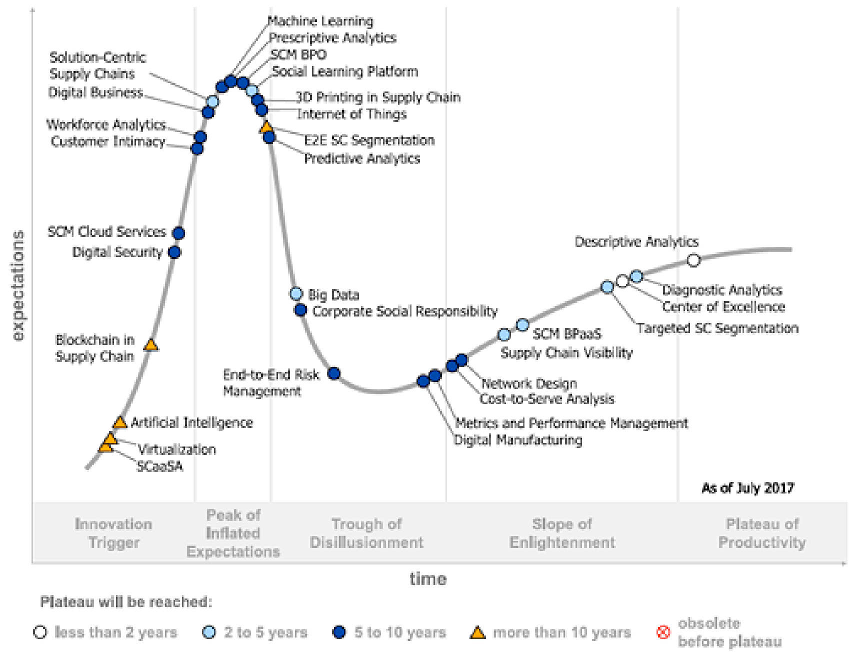
Fleet Operator Recognition Scheme, London

5.8 Fuel efficient driving should be part of any future strategy to decarbonise the freight sector. Transport for London is responsible for the successful Fleet Operator Recognition Scheme which offers organisations bronze, silver and gold accreditation by training operators and drivers in fuel management as well as safer driving. This shows that even a voluntary scheme can make a significant impact with 4,700 members to date.

6.0 QUESTION 5

How could technologies be utilized to increase the efficiency and productivity of UK Freight?

6.1 By 2022, there are several disruptive innovations expected in the Supply Chain, particularly related to technology. These can be seen in Gartner's Hype Cycle (released Q3, 2017) shown below.



6.2 New methods of analytics, such as Diagnostic and Predictive Analytics will enable companies to understand why something happened, and also look toward what might happen tomorrow. This will be supported by developments in areas such as Internet of Things (IoT) and Real-Time technology.

6.3 Other innovations have evolved around the use of the cloud and Big Data (which has been critical in improving analytics and real-time end-to-end supply network visibility). SC Management Business-process-as-a-service (BPaaS) will offer the opportunity to quickly implement valuable business processes like compliance and reporting, freight forwarding, customs processing, aftermarket management, etc., without the need for major department change/creation or new enterprise technology. This move towards Digitisation is also enabling Supply Chain Management applications and Social tools to come together, as Supply Network (SN) solutions adopt more Social features in support of both knowledge improvements and improved SN management (such as One Network's Social Apps[21]). This Digitisation also enables

[21] One Network's Social Apps

customers to be offered a more personalised collection of products, data and services from a digitally-enabled ecosystem of partners.

Dynamic Lanes

6.4 In order to make more efficient use of existing infrastructure, authorities are currently researching and piloting ways in which road lanes can be prioritised for different modes at varying times of the day, responding to demand. Transport for London intends to trial dynamic bus lanes, dynamic parking and loading options and speed limit changes on chosen corridors. There could be justification to extend these principles to more efficiently accommodate freight movements.

7.0 QUESTION 6

Are there good examples internationally of freight systems, policy, infrastructure or technology development and implementation that the UK can learn from to increase freight efficiency and/or reduce the carbon and congestion impacts?

7.1 We set out below some good international examples that the UK can learn from to increase freight efficiency and/or reduce the carbon and congestion impacts.

Chapelle International - Distribution Centre, Paris

7.2 When complete, this innovative solution will comprise a rail freight terminal, access for large trucks and electric vans for onward "last mile" deliveries from their site in northern Paris. The surface level roofing will comprise sports fields ensuring further environmental benefits. This is pursuant to the city's urban warehouse strategy which allows freight operators to occupy centrally located city hubs at affordable rates for more efficient freight consolidation.

Multi use lanes in Barcelona

7.3 We have set out the how demand has changed for freight over the last two decades and the key drivers which we consider will change the future of the logistics sector below.

7.4 In Barcelona, there are six multi-use boulevards where the side lanes are restricted to general traffic (8:00 to 10:00); pick up and deliveries only (10:00 to 17:00); general traffic (17:00 to 21:00) and on street residential parking (21:00 to 8:00). Variable message signs inform drivers of the regulation in real time. Benefits include:

- Reduction of parking & unloading in the wrong place;
- Satisfaction of logistics operators with fewer fines
- Optimization of the distances travelled
- Residents' satisfaction due to extended free parking space
- Reducing pollution by less lag in the second lane

La Petite Reine, Paris, France

7.5 La Petite Reine is a privately operated cargo cycle delivery service that started off in the centre of Paris, to test an alternative to motorised vehicles for final delivery of goods. An independent consultant carried out a study in 2012 showing that over a 12-month period, 203 tons of CO2 were saved by not utilizing vans for delivery[22]. Operations by La Petite Reine have since expanded and there are an estimated 1 million deliveries by cargo bikes each year across France. These zero emission solutions will become more and more important as e-commerce and home deliveries continue to grow.

Vehicle of La Petite Reine
Source: www.flickr.com/photos/croquezz/5311404237/sizes/l/in/photostream/

Consolidation of Deliveries

7.6 Consolidation centres outside towns/cities are, at present, arranged individually in accordance with individual business needs, with no cooperation or sharing of vehicles or infrastructure. This means each delivery company will have its own consolidation centre. A more efficient and economic method would be to cooperate between companies within these hubs. However, unless incorporated into planning permission, participation in consolidation schemes cannot be enforced.

7.7 Merchandise Pick up Points (MPuP) can also be located at key locations and can enable the collection of pre-purchased goods by the public instead of visiting the inner city. Such schemes could benefit from being implemented with existing bundling operations where a vehicle (single operator) is already delivering goods to and from a centrally located hub outside the city centre close to main road networks. Collection of goods from pick up points could provide shoppers with an alternative option to obtain goods purchased, resulting in reduced vehicle movements and associated impacts in city centres.

[22] http://sustainability.ei.columbia.edu/files/2016/05/Tel-Aviv.pdf

7.8 Within towns and cities, they could be divided up into zones depending on the types of goods, street typology and the distance delivery points or proximity delivery areas (PAs) which act as urban transfer platforms for the loading and unloading of goods (as per city of Vitoria-Gasteiz pictured). From the PAs to the shops goods could be transported using clean transport. The occupancy of vehicles at the PAs will need to be controlled through time windows to ensure a reduction in the likelihood of congestion and a traffic light system which times occupancy and notifies drivers of availability when empty would be beneficial. Such a system should make the control and supervision by municipal offers simpler.

7.9 An alternative way of enabling new distribution schemes is to develop a virtual common logistics platform as part of a van-sharing scheme for smaller freight operators. The platform collects information on orders, organizes loading and unloading trips, calculates the optimal routes using real-time traffic data, and reserves parking slots which are monitored in real-time specifically for vehicles (as per city of Bologna). Such schemes should have a direct impact on average saturation levels of vehicles used to delivery to the city centre by aggregating orders originating from different logistics operators performing the ‘last mile’ service. Economic incentives may need to be provided to engage operators to participate in van sharing schemes and consortium to offset against potential lower revenue and loss of flexibility.

8.0 CONCLUSION

8.1 This Report has been prepared on behalf of IM Properties Development Limited in response to the National Infrastructure Commission's Freight Study Call for Evidence (January 2018). The Report demonstrates the significant contribution that this exciting and diverse sector makes to the UK Economy and the need for future policy and guidance to understand and respond to the key challenges around effectiveness and efficiency.

8.2 We provide a summary of the key points set out in the response below:

Question	Response
What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?	• Congestion is a significant constraint and future policy should consider modal shift, using under-utilised areas of the network (e.g. M6 Toll) and consider the role that Sustainable Urban Logistics Plans (SULPs) can play in forming a strategy for urban freight including consolidation centres and last mile solutions. • Planning Policy at both the national and local scale must be resilient and adaptable, and conceived in a manner that acknowledges the current and future needs of the sector. • Right Land/Right Places – more needs to be done to ensure large strategic sites are located in the best possible places. • Loss of Urban Employment Land – The protection of strategically located urban employment sites needs to be strengthened with the emerging London Plan providing a useful blueprint for policy-makers. • Strategic Planning Powers – Mayors should benefit from strategic planning powers to enable the alignment of Local Industrial Strategies, land assembly and infrastructure investment; particularly to address issues of 'larger than local' need. • Public and Political Perception – The significant benefits of this exciting and vibrant sector need to be communicated more effectively to policy makers, decision takers and key stakeholders to tackle negative stereotypes.
How might the demand for freight develop and change over the next 20-30 years?	• Brexit – The impacts of Brexit upon the sector are still unclear at present but setting the right conditions for investment will be imperative to the UK's future prosperity.

	• Diversification – Continued growth in the sector will result in a more diverse range of facilities, locations and operating models and processes that in itself presents a challenge for future policy. • Carbon Challenge – The sector faces a challenge to adapt to meet climate change objectives with shared logistics centres providing a potential solution. However, the reliance on electric vehicles brings new challenges associated with battery design. • New Technology – Drones, robots, peer-to-peer delivery and autonomous trucks all represent new technologies that are starting to emerge to deal with the above issues.
What effects does congestion have on the efficiency of freight movements and emissions?	• Severe Economic Impact – Congestion has a huge economic impact with the cost to the UK estimated to be £307 billion from 2013 to 2030. • New Solutions such as using alternative modes, greater utilisation of the existing network, cycle logistics and the retiming of deliveries are potential solutions that can assist in reducing its impact on the supply chain.
How can freight lower its carbon and air quality impacts?	• Air Quality Management Policies – an appropriate transitionary period is required to enable freight operators to modernise their vehicle fleet and provide the corresponding infrastructure. Geographical disparities in air quality management policies can hinder the operation of electric vehicles that are not able to re-charge at the end destination without the provision of the requisite infrastructure. • Clearer Policy Guidance and Advice – Clearer policy guidance and pre-application advice is needed in respect of air quality mitigation and contributions. • Battery-electric tricycles and Fleet Operator Recognition Scheme – presented as possible ways in which freight can lower its carbon impact.

How could technologies be utilized to increase the efficiency and productivity of UK Freight?	• Increasing Digitalisation - Diagnostic and Predictive Analytics, Big Data, Dynamic Lanes are used to increase efficiency and productivity.
Are there good examples internationally of freight systems, policy, infrastructure or technology development and implementation that the UK can learn from to increase freight efficiency and/or reduce the carbon and congestion impacts?	• European Best Practice - Examples are provided in the form of the following: 1) Chapelle International, Paris 2) La Petite Reine (Paris) 3) Multi-use Lanes (Barcelona) 4) Consolidation of Deliveries (Bologna)

APPENDICES

Appendix 1: Savills Article dated 4th December 2017.

[Appendix removed to manage document length. Article available at https://www.savills.co.uk/insight-and-opinion/savills-news/225528-0/take-up-of-industrial-space-by-online-retailers-grows-by-731--in-under-a-decade]

Appendix 2: North Northamptonshire Joint Core Strategy Policy 24 (Logistics).

[Appendix removed to manage document length. Core Strategy available at http://www.nnjpu.org.uk/publications/docdetail.asp?docid=1573]

Appendix 3: North West Leicestershire Local Plan Policy EC2 (New Employment Sites).

[Appendix removed to manage document length. Local Plan available at https://www.nwleics.gov.uk/pages/local_plan]

Appendix 4: United Kingdom Warehousing Association (UKWA) 2017 Manifesto.

[Appendix removed to manage document length. UKWA 2017 Mainfesto available at https://www.ukwa.org.uk/wp-content/uploads/2017/10/UKWA-Manifesto-September-2017-Why-logistics-is-important-to-the-UK-economy.pdf]

Appendix 5: Draft Policy E7 of the Draft London Plan.

[Appendix removed to manage document length. Draft London Plan available at https://www.london.gov.uk/what-we-do/planning/london-plan/new-london-plan/draft-new-london-plan/]

Appendix 6: Savills Article dated 26th December 2017.

[Appendix removed to manage document length. Article available at https://www.thisismoney.co.uk/money/markets/article-5213221/Amazon-fights-warehouse-space-retail-wars-heat-up.html]

National Infrastructure Commission Freight Study Call for Evidence

Consultation Response

Prepared on behalf of SEGRO Plc

March 2018

bartonwillmore.co.uk

BARTON WILLMORE
PLANNING / DESIGN / DELIVERY

CONTENTS

APPENDICES

1.0 EXECUTIVE SUMMARY

1.1 This Report sets out SEGRO's response to the National Infrastructure Commission's (NIC) Freight Study Call for Evidence (January 2018). SEGRO welcome the opportunity to contribute to shaping future freight policy and guidance to maintain the sector's growth into the future. Our response to the NIC's Freight Study Call for Evidence is summarised in the below table:

Question	Response
What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?	• The 'Three C's': Ensuring that impacts upon freight are considered when formulating policy and guidance to address issues of Congestion, Capacity and Carbon; particularly given freight's heavy reliance upon the strategic road network. Infrastructure investment needs to be targeted in the right places at the right times. • Existing Freight Policies: It is important that future freight policies are predicated on a well-developed understanding of freight operations which can be obtained through discussions with business leaders and key stakeholders to ensure it is not over-regulated. • Supply Chain Issues: It is essential that large strategic sites are provided in the right locations to address 'larger than local' need. Similarly well-located urban employment land needs to be protected through the strengthening of planning policy. For example, the draft London Plan provides a blueprint that can be used elsewhere. • Planning Policy and Evidence Base: We support revised national guidance requiring regular evidence base updates to inform planning policy, local land allocations and planning permissions. • Geographical Disparities: Effective strategic governance is required to ensure a joined-up approach from policy makers, local authorities (including their Highways Authorities), business representatives, key stakeholders and infrastructure providers (i.e. Highways England and Network Rail) in addressing geographical disparities in funding and investment, education and skills to boost productivity. • Public and Political Perception – The significant benefits of this exciting and vibrant sector need to be communicated more

	effectively to policy makers, decision takers and key stakeholders to tackle negative stereotypes.
How might the demand for freight develop and change over the next 20-30 years?	• Digitalisation and E-Commerce: The rise of e-commerce is expected to continue into the future and this is important that policy is both resilient and adaptable to change. • Resurgence of the Port: Infrastructure investment and land assembly around multi-modal freight hubs should be prioritised in the interests of sustainable development and productivity gains. • Modal Shift (Road to Rail) – There is a need for a network of Strategic Rail Freight Interchanges (SRFIs) which will help to mitigate congestions and improve air quality. In order to do this, planning consent needs to be secured for such complex schemes and the ability to integrate such freight facilities within the rail network needs to be prioritised. • Climate Change: It is important that climate change policies recognise the nature of freight operations and do not act as an impediment to their effectiveness and efficiency. • Technological Advancement: Alternative fuels and technologies (i.e. digitalisation, electric vehicles, autonomous vehicles, drones, robots, HGV platooning and smart motorways) will provide a response to the challenges of the three C's. • Use of Planning Tools: The use of NSIPs and DCOs are supported to help with the provision of essential freight infrastructure. • Brexit: Setting the right conditions for the movement of goods and services will be essential for a successful Brexit and imperative for the UK's future prosperity. • Automation and Electric Vehicles: To support the uptake of sustainable transport options ensure the right level of priority is afforded to the provision of utility supplies (i.e. electricity) to the preferred locations.
What effects does congestion have on the efficiency of freight movements and emissions?	• Economic and Environmental Impact - 90% of freight movements are by roads, which results in congestion having significant impacts upon the supply chain. • Modal Shift, Drones, Out-of-Hours and Re-Timed Deliveries - Provide solutions to congestion issues. The use of

	urban consolidation centres will assist in programming when deliveries can be made in a co-ordinated way, thereby ensuring that the available infrastructure is used efficiently across a 24 hour period.
How can freight lower its carbon and air quality impacts?	• Management and Distribution Practices - can reduce CO_2 and NO_x emissions including: using real time data; consolidation software; vehicle routing; alternative fuels; cycle logistics; mode change; and delivery consolidation. • Effective Air Quality Management – a consistent policy framework for commercial vehicle emissions is required to provide the freight sector with certainty and this needs to provide flexibility to enable operators to respond to new policy.
How could technologies be utilized to increase the efficiency and productivity of UK Freight?	• Connected and Autonomous Vehicles – will have an impact upon the capacity and performance of freight and will help alleviate the driver shortage the industry faces. • Increasing Automation - The automation and digitalisation of the supply chain will have a significant impact for freight in the future and policies and regulations will need to be more agile to facilitate this.

2.0 INTRODUCTION

2.1 We write on behalf of our Client, SEGRO Plc, to respond to the National Infrastructure Commission's Freight Study Call for Evidence (January 2018). This Call for Evidence will enable the key opportunities and threats to the freight sector to be identified. We welcome the opportunity to contribute to shaping future freight policy and guidance to maintain the sector's growth into the future.

2.2 SEGRO is a UK Real Estate Investment Trust (REIT), and a leading owner, asset manager and developer of modern warehousing and light industrial property. It develops and invests in property located in the UK and Continental Europe with a focus on edge of town locations.

2.3 SEGRO therefore uniquely positioned to comment on the freight sector as it has a broad range of well located, modern, sustainable assets within its property portfolio, which include big box logistics ('first mile solutions') and urban logistics ('last mile solutions') across the Midlands, Greater London and the Thames Valley. . The former tend to be located on Europe's major transport corridors, from which goods are distributed regionally, nationally and internationally. The latter are located in and around Europe's major cities, allowing quick access to customers and easy access for companies' workforces. This includes workshops, laboratories, data centres, showrooms and distribution facilities, amongst a wide variety of other uses.

2.4 SEGRO has a wide-range of accommodation to offer their customers that include DHL; Royal Mail; Fedex; Sainsbury's; Tesco; British Airways; DB Schenker; Mars Chocolate; /DPD and Hermes. These customers are heavily reliant upon freight for the efficient operation of their businesses.

2.5 The freight and logistics industry is a significant driver of economic growth and is of major importance to the UK economy. According to the Freight Transport Association (FTA) Logistics Report (2017), there are 178,295 logistics enterprises in the UK. In terms of employment numbers, there are 2.54 million people working in logistics, which represents 8% of the UK workforce.

2.6 The subsequent sections of this Report are structured to provide a response to the questions sequentially as they appear in the Freight Study Call for Evidence (January 2018).

3.0 QUESTION 1

What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?

3.1 The National Infrastructure Commission Report 'Congestion, Capacity, Carbon: Priorities for National Infrastructure' (2017) identified three key challenges for infrastructure presented as the 'Three Cs' (Congestion, Capacity and Carbon). All of the Three C's are directly applicable to the freight sector, largely due to its heavy dependence on infrastructure and the road network in particular. Alongside these considerations, we have also considered a number of other constraints which affect the efficient movement of freight which are detailed under the headings below.

Congestion

3.2 The National Infrastructure Commission Report recognises that levels of congestion, driven by population growth, urbanisation and new working and living demands, are clogging up the UK's cities and its transport and digital systems.

3.3 Congestion is a key constraint for the freight sector and logistics industry within the UK, due to the impacts on the supply chain and movement of goods. Delays cost both time and money for suppliers and retailers. This is a particular problem on key strategic routes for freight moved by road, where general traffic numbers are high, as well as in urban areas where population density naturally leads to greater congestion levels. In turn, these congestion levels have a knock on effect on other parts of life, such as the environmental effects caused by emissions.

3.4 Several options are available in order to improve congestion issues, or at the very least reduce the impact on the freight industry. These options range from reducing the need to use the highway network in general and utilising rail and river freight options as much as possible (i.e. modal shift). Rail freight has been shown to be a competitive alternative for some commodities on longer journeys of around 300 kilometres and therefore provides a viable solution – particularly as an average freight train moves the equivalent load of some 76 HGVs. Unfortunately rail has not been exploited to the full for a range of reasons, not least the lack of a strategic network rail freight interchanges across the country.

3.5 Should it be necessary to use the highway network, other possible solutions are greater use of distribution hubs outside of cities with pooled 'last mile' deliveries to reduce the number of vehicles in the city centres, lorry platooning to reduce the amount of space taken up on motorways and a greater use of alternative fuelled vehicles to reduce the amount of emissions given off whilst in congestion.

Capacity

3.6 As set out in the National Infrastructure Commission Report, smart technology can reduce some infrastructure pressures. However, new technology and congestion management is not considered to be enough and additional modern infrastructure is required.

3.7 A lack of sufficient infrastructure is considered to be a key factor in any efficient freight system. The lack of / inadequate existing infrastructure is a further barrier to the efficient movement of freight. This is because in certain places there is not the quality of infrastructure within the existing road and rail networks to deal with the amount of freight. An example of this is Operation Stack where the road network leading up to the Eurotunnel is not capable of dealing with the amount of vehicles queueing when disruption to the tunnel occurs. This causes significant knock on effects with vehicles, drivers and goods all delayed. This is not, therefore, in the right place to allow the freight industry to run efficiently.

3.8 The resolution to this is a greater investment in infrastructure for freight vehicles. The investment required is not necessarily always in greater capacity, although this will help whether it is rail or road capacity, but a greater resilience to shocks in the network so that when a problem occurs the network is able to adapt and still run efficiently. Examples of this type of planning include the proposed, but now dropped, M20 lorry park at Stanford near Folkestone.

Carbon

3.9 The National Infrastructure Commission Report recognises that more effort is required to reduce CO_2 emissions for the UK to meets its climate change targets.

3.10 AQMAs and Local Air Quality Action Plans are implemented in areas where Air Quality objectives are not likely to be met and when this occurs local authorities are then responsible for creating a Local Air Quality Action Plan. This provides a constraint to efficiency as these AQMAs can target freight vehicles as the main issue when tackling air quality. This then results in negative strategies being placed on freight vehicles such as restrictions on timings and routing, although in practice the volume of passenger vehicles is just as much of an air quality issue. Similarly, this is the case with Clean Air Zones (CAZ). As per DEFRA's Clean Air Zone Framework the vision for CAZs is to improve the urban environment and provide benefits for public health, the local economy and to make cities more attractive places to live and work. The CAZ framework includes emissions standards where all new cars and vans are emission free by 2040. Whilst freight vehicles themselves are not singled out by the CAZs, it is another example of further restrictions on the existing freight industry.

3.11 Routing strategies, secured through Travel Plans and Section 106 Agreements, also provide a constraint to the freight industry and often weight or height limits prevent lorries from using the most direct and efficient route. Policies such as the London Lorry Control Scheme (LLCS) also have an impact on routing as this prevents vehicles from using certain routes within London at certain times of the day. This also states that HGV vehicles need permissions to use certain roads, adding an extra layer of bureaucracy to the delivery process.

3.12 The need for some of the constraints applied on freight by AQMAs and routing strategies is understood, as evidently height and weight restrictions are in place for a reason and freight vehicles do contribute to emission and environmental problems. Whilst this may be the case, this can be overcome through methods such as alternative fuelled vehicles to reduce the emissions and therefore the need to reroute due to noise and emissions issues.

Existing Freight Policies

3.13 As per the previous answer, policies such as the LLCS create constraints on the movement of freight. Additional policies like this include the Mayor's Transport Strategy (MTS) in London where many policies are set out to control delivery, servicing, construction and logistics. These policies attempt, for numerous reasons, to control the timings, hours and routes of these services. Reasons for this include issues with noise in anti-social hours, emissions and resident perceptions of HGVs on quieter routes. This creates barriers and restrictions again reducing the efficiency of the freight network as policies are in place to directly influence and restrict the industry whether this be large scale HGVs or smaller servicing vehicles.

3.14 To readdress the influence that freight policies can have on the industry, it isn't the case that these policies and restrictions should be removed as there is wider benefit to society as a result of these policies. A better solution is that the policies are changed to reflect the importance of an efficient freight network and that the freight industry works to improve as well as influencing policy to ensure that it is not over regulated to the extent the industry becomes inefficient.

Lack of Large Strategic Sites

3.15 A key constraint to the effective and efficient movement of freight is the significant shortage of large strategic sites in key locations throughout the UK, such as the Midlands and South East, despite high levels of demand. A lack of large strategic sites in close proximity to urban centres and residential catchments is currently a limiting factor for the 'big box' market.

3.16 At the Industrial and Logistics Summit in November 2017 (Appendix 1), Estates Gazette advised that in the first quarter of 2017, the average size of warehouse and distribution units was 18% larger than the ten year average. Both Mega (over 500,000ft^2) and large (100,000-499,999ft^2) units accounted for a greater share of the market, which is driven by e-commerce. Indeed, retailing accounted for 46% of take-up between 2016 and 2017 and it is consumer demand and reduced delivery times that is forcing retailers to adapt and evolve. However, with only a reported 1.36 years' supply of stock available in the West Midlands and 1.86 years' supply in the South East, mega and large sized units are becoming more constrained. Accordingly, in its 2017 Manifesto, the United Kingdom Warehousing Association (UKWA) (Appendix 2) stated:

> "A key issue facing the UK warehousing sector is a lack of warehousing space currently available and the amount of land coming forward for new warehouse schemes. Under pressure to build more homes, local authorities are struggling to balance the needs of a land hungry logistics sector which will become even more important should Government ambitions be realised to build 240,000 homes per year".

3.17 Taking the West Midlands as a case in point, the West Midlands Land Commission's (WMLC's) Final Report (January 2017) highlighted the critical shortage of strategic employment sites, which was underpinned by the findings of the West Midlands Strategic Employment Sites Study (September 2015). Paragraph 5.20 of the WMLC Report states:

> "Ensuring a good supply of employment premises - in the right place, at the right price, at the right time and to the right specification – is essential to the growth of businesses in the West Midlands and the achievement of the employment targets in the SEP. Although in recent months much of the focus at regional and national level has been on housing, the evidence the Commission has seen suggests that the shortfall of land for employment space is at least as pressing as the shortage of land for new homes, and possibly more so."

3.18 Given the slow pace of local plan preparation in many areas and a lack of 'oven ready' employment sites, coupled with the fact that many of the prime locations for employment sites fall near to motorway junctions within the Green Belt, we are seeing more and more instances of developers having to demonstrate 'very special circumstances' in order to satisfy their growth requirements, which presents a significant risk to investment and requires significant resources in order to obtain a planning permission. Indeed, this resulted in the WMLC calling for a strategic review of the Green Belt as it was evident that its growth ambitions could not be accommodated through development on brownfield land alone. It identifies six 'game changers' as part of its recommendations to the West Midlands Combined Authority (WMCA) if its Strategic Economic Plan targets are to be achieved. One of these, at Paragraph 2.10, is:

> "A Strategic Review of the Green Belt [Section 9] in the geographical areas covered by the WMCA. The Commission believes that even an effective, well-funded remediation programme is

> unlikely to provide a sufficient supply of developable land to meet the SEP's ambitions and targets on its own, and therefore a mixed strategy will need to be adopted…"

3.19 If the above land supply issues are not addressed, landlords and property developers may be forced to move away from what have traditionally been key industrial locations such as Northampton, Park Royal, Daventry and Rugby. In December 2017, Savill's reported that markets that are currently viewed as secondary may become prime hotspots (Appendix 3):

> "Moving forward however, a significant lack of supply, coupled with factors beyond the control of landlords and property developers – such as the availability of land, labour and energy provision – will mean markets that are currently viewed as secondary are set to become prime hotspots, particularly along the M5, A1 and A14 motorway corridors."

3.20 In SEGRO's view, what is required is greater co-ordination between land use and existing and proposed infrastructure planning to ensure that freight and warehousing infrastructure is planned in the right locations to boost the UK's productivity and prosperity.

Strategic Rail Freight Interchanges

3.21 The aim of a Strategic Rail Freight Interchange (SRFI) is to optimise the use of rail in the freight journey by maximising rail trunk haul and minimising some elements of the secondary distribution leg by road, through the co-location of other distribution and freight activities. SRFIs are a key element in reducing the cost to users of moving freight by rail and are crucial in facilitating the efficient transfer of freight from road to rail, thereby reducing trip mileage of road freight movements on both the national and local freight networks.

3.22 The National Networks NPS sets out the need for SRFIs in Paragraphs 2.42 to 2.58. In particular, Paragraph 2.53 states:

> "The Government's vision for transport is for a low carbon sustainable transport system that is an engine for economic growth, but is also safer and improves the quality of life in our communities. The Government therefore believes it is important to facilitate the development of the intermodal rail freight industry. The transfer of freight from road to rail has an important part to play in a low carbon economy and in helping to address climate change".

3.23 These facilities are important to the UK economy, and for reducing vehicle emissions. However, the planning process is incredibly long, costly and highly contentious given that these sites tend to be on Green Belt. SEGRO is involved in three SRFIs including Radlett, Howbury and consented scheme at East Midlands Gateway.

3.24 It is considered that the Government needs to provide strategic guidance and create spatially specific policies in the National Networks NPS rather than leave it for developers like SEGRO to promote these sites, which are so crucial to the logistics and freight industry.

Loss of Urban Employment Land

3.25 One of the key issues facing urban logistics is the loss of available employment land in urban locations. This is problematic given the rise of e-commerce and, linked to that, the increasing demands of the consumer which means that many investors and 'last mile' operators prefer sites that offer 30 minute drive time access to inner cities. Increasingly, employment uses are competing with high-value residential development that is being prioritised in many locations to tackle the UK's housing crisis. This has been accelerated by recent legislative changes such as the introduction of Permitted Development Rights allowing conversion from commercial uses to residential.

3.26 The above is most pronounced in Greater London where there are a number of evidence base documents that have highlighted that the loss of industrial land has occurred at a far greater rate than the 37 hectare per annum benchmark set out in the Land for Industry and Transport Supplementary Planning Guidance (September 2012) and subsequent London Plan (March 2016). The London Land Supply and Economy Study 2015 identified that, on average across London, three times the target annual loss of industrial land has been released in the last five years (106 hectares per annum). It reported that an estimated 1,300 hectares of industrial land in London was transferred to other uses between 2001 and 2015; representing a 16% contraction over that period. It warned that, if this rate of loss were to continue into the future, levels of industrial land would reach critical levels that could lead to difficulties in market operation. This message was reinforced through SEGRO's Keep London Working Report (February 2017) (Appendix 4).

3.27 On the demand side, Page 14 of the Urban Logistics: The Ultimate Real Estate Challenge Report (2017) (Appendix 5) states that London, which has a mature e-commerce market, had an urban logistics requirement of 870,000m^2 in 2017, expected to rise to over 1.2 million m^2 by 2021:

> "Looking at the model's estimates, London stands out with a current total urban logistics space requirement of almost 870,000 m^2. In terms of population and buying power, London is the largest and most mature eCommerce market in Europe. According to the

> Centre for Retail Research, Brexit, and market maturity will contribute to slower eCommerce growth in the UK. Required space in London is expected to reach 1.2 million m² in 2021, an increase of 43%…"

3.28 With a growing disparity between supply and demand resulting from the shortage of industrial land in urban areas, some logistics and industrial facilitates are being developed in sub-optimal locations, away from the catchments they serve. These Sites may not, for example, have good access to the strategic road network or labour supply and this results in freight operators and staff having to travel further distances. In an article entitled 'The Last Mile', in the February 2018 edition of The Planner, (Appendix 6), Natalie Chapman, Head of Policy for London at the Freight Transport Association, stated:

> "…depots occupy sites more distant from population concentrations and so delivery journey distances get longer, resulting in higher volumes of road traffic."

3.29 This, in turn, is more expensive, less sustainable and operationally inefficient; clearly accentuating the problems identified by the National Infrastructure Commission (i.e. the Three C's).

3.30 The growth and effective operation of freight providers will only be possible through the provision of the right type of space in the right locations. An essential prerequisite is the protection of existing employment land, particularly where it falls in strategic locations that enable the penetration of residential catchments. This can only be achieved if the right policy framework is provided.

3.31 We are, therefore, encouraged by the overarching 'protectionist' principles of the draft policies contained in the emerging London Plan that seeks no net loss of industrial floorspace capacity (and operational yard space capacity) within Strategic Industrial Locations (SILs) and Locally Significant Industrial Sites (LSISs). The emerging policies advise that the retention and provision of additional industrial capacity should be prioritised in certain locations, including those that can accommodate urban logistics to support large-scale residential or mixed-use developments. The shift from land to floorspace allows any release of employment land to be compensated for through industrial intensification, co-location and substitution. Accordingly, draft Policy E7 provides detailed policy guidance on the measures that can be implemented to facilitate these processes and we are already seeing this take place in key locations.

3.32 We consider these principles could be applied more widely to other Combined Authority Areas, such as the West Midlands and Greater Manchester, as they assist in maintaining a balance between housing and employment as well as recognising the operational requirements of urban logistics operators. Similarly, new large-scale masterplans should consider the incorporation of last mile solutions to serve the newly created residential areas given the rise in online retailing.

3.33 In response to the lack of employment sites, we are also starting to see innovative solutions emerge that seek to maximise the limited space available in urban areas. Multi-level logistics developments may become more common with SEGRO's recent Paris Air[2] Logistique development in France serving as a blueprint for future London-based development. An alternative take on multi-level solutions is Formal Investments Limited's subterranean warehouse in Hounslow. Similarly, the notion of 'beds and sheds' is well documented. At St. Pancras Way in Camden, a student accommodation provider UNITE secured planning permission in partnership with Travis Perkins for a 564 bed scheme over a new trading facility on the ground floor.

Planning Policy and Evidence Base

3.34 Planning policy represents a significant constraint to freight. As highlighted above, all too often proposals for large warehouse units (and the infrastructure required to support them) come into conflict with Green Belt policy and landscape designations. This is largely the result of their scale and land hungry nature (i.e. there are not brownfield sites of an adequate size available in urban areas to accommodate them), but also their preferred locations. These tend to be located on the edge of urban areas or near to motorway junctions that are often subject to Green Belt and landscape policies. This precludes the formation of the most sustainable patterns of development as logistics operators are pushed to outlying areas rather than adding to the critical mass of existing services and infrastructure. This places great emphasis on Paragraph 84 of the National Planning Policy Framework (NPPF) and the need for local authorities to take into account the growing needs of the sector when defining their Green Belt boundaries through an emerging local plan or local plan review.

3.35 The NPPF includes very broad policies when it comes to 'building a strong, competitive economy', and clearly advises that 'significant weight' should be placed on the need to support economic growth through the planning system. There are, however, no specific policies relating to the needs of businesses associated with freight. This differs from the now superseded Planning Policy Guidance 4 (PPG4) 'Industrial, Commercial Development' which included the following at Paragraph 12:

> "Some types of modern distribution facility have a low density of employment, and are served by a very large number of lorries. Retail distributors, for example, depend on efficient distribution systems and require strategic locations capable of serving regional, national and European markets. Extensive, well-planned out-of-town distribution parks can offer economies of scale and

consequent benefits to consumers or businesses supplied. Sites for such developments are best located away from urban areas, where the nature of the traffic is likely to cause congestion, and wherever possible should be capable of access by rail and water transport. Such sites should be reserved for those warehousing uses which require them, and not released for other uses unless there is a clear surplus of suitable sites in the area, and no realistic prospect of development for that purpose in the foreseeable future. Separate guidance on the location of retail development is provided in PPG6."

3.36 It is our view that this is something that could be addressed through the forthcoming revisions to the NPPF later this year; particularly given the suggestion in the Housing White Paper 'Fixing Our Broken Housing Market' (February 2017) of reviewing Green Belt land around transport hubs, which would clearly be of benefit.

3.37 At the local level, there are examples of bespoke policies such as Policy 24 (Logistics) of the North Northamptonshire Joint Core Strategy (July 2016) (Appendix 7) that are welcomed in terms of recognising the needs of the market subject to certain criteria being met. However, such policies are not commonplace.

3.38 It is considered that local authorities should ensure that they have a robust and up-to-date evidence base as this is an essential part of the plan-making process and should underpin new policies. We consider local authorities should be obligated to undertake regular and robust employment land reviews. Since the 2004 Employment Land Reviews Guidance Note was cancelled and its contents (to an extent) brought into the Planning Practice Guidance (PPG), there have been concerns that the evidence bases used by local authorities in these decisions are often out of date. For example, research undertaken in 2015 found that half of local authorities in England rely on employment land evidence which pre-dates the NPPF and is therefore unlikely to reflect the current economic situation and levels of commercial demand. There is no formal requirement for an annual update of employment land allocations, other than saying they should be 'regularly reviewed'. We would support stronger guidance that local authorities update these on a specific regular basis, and look more carefully at their future employment land provisions and the type of jobs that may be created by the various key sectors in the future to replicate what is done in respect of housing. Again, there is a window of opportunity to address this through the forthcoming changes to the NPPF.

3.39 It is considered that emerging national and local planning policy needs to place a greater emphasis on supporting growth in the freight sector. It is important that national, regional and local policies work in tandem to ensure suitable existing employment sites are protected and new allocations are identified in the right locations to meet demand and support freight. This is reinforced through the recommendations in the British Property Federation (BPF) Report

'Delivering the Goods' (December 2015) which identifies that the right quantity of employment space in the right locations should be supported through national planning policy, local land allocations and planning permissions.

Geographical Disparities

3.40 Geographic disparities between different regions (often presented as the north/south dichotomy) can hinder the effective and efficient movement of freight. The Government's 'Building our Industrial Strategy' Green Paper (January 2017) identifies there are regional disparities in how the public and private sector spend money on research and innovation, with UK public Research and Development funding heavily focussed on the 'golden triangle' of Oxford, Cambridge and London. As such, excellence in research and innovation that exists in other parts of country need to be targeted to ensure the full benefit is distributed. Similarly, the Industrial Strategy White Paper 'Building a Britain Fit for the Future' (November 2017) highlights the UK has greater disparities in regional productivity than other European countries. These disparities include access to finance and investment that represents a constraint to the freight sector. The Industrial Strategy explains that over 70% of investment in 2016 was made in the south east and the productivity gap between different parts of the country has been widening for decades.

3.41 The Industrial Strategy recognises that there is a need to tackle entrenched regional disparities in education and skills levels. According to research by the Confederation of British Industry, disparities in education and skills are the biggest drivers of regional variations in productivity. Therefore, actions and initiatives to increase skill shortages need to be taken to close the skills gaps between regions. Obligations for Employment and Skills Plans (ESPs), required by Supplementary Planning Documents and secured through Section 106 Agreements are becoming more common to address this issue, but it is important that these are deliverable and provide a degree of flexibility so that they are not too onerous.

3.42 Similarly, regional disparities relating to the provision of infrastructure represents a significant constraint for freight. The Government's Industrial Strategy Green Paper highlights that people experience lengthy journey times and poor transport links, particularly outside London and the South East. For example, Manchester and Leeds are less than 40 miles apart and due to congestion on the M62 Motorway this journey can take more than two hours. A joined-up approach is required to improve infrastructure and congestion across the whole country to minimise these disparities.

Public and Political Perception

3.43 The public and political perception of the freight sector is considered to be another constraint to its effective and efficient operation. Often there are misplaced negative connotations linked to freight, including part-time employment, poor salaries and low skills. This is considered to be a result of a poor understanding of the sector.

3.44 The BPF ‘Delivering the Goods’ Report challenges the perceptions of the freight and logistics sector and identifies that only around 15% of employees in the sector work part-time, compared to an average of 32% nationally. Furthermore, part-time employment in the sector has been decreasing in comparison the national level. The sector does, however, rely on a seasonal increase in employment to meet increased demand around the Black Friday and Christmas period. The BPF Report also notes that companies are keen to provide secure employment by reducing the use of agency staff and increasing the proportion of the workforce directly employed.

3.45 Contrary to the perception that salaries in the sector are low, the BPF Report makes reference to data from the Annual Survey of Hours and Earnings that identifies average salaries in the logistics sector (£28,000) are above the national average (£20,000). Furthermore, the average salary has grown at a higher rate (7%) from 2009-2014 than the national average (3%). Furthermore, average salaries in rail freight (£40,000) are especially notable compared to the national average. As the freight sector continues to grow alongside the growth of e-commerce, it is likely that the average salary in the sector will continue to increase. As such, this needs to be promoted to help overcome the negative perception of the sector.

3.46 The sector is often believed to only provide low skilled, elementary jobs. However, the BPF Report identifies that a wide range of jobs are supported in the sector. Whilst elementary occupations are common, logistics activities also offer positions in managerial, administrative and high tech occupations including electrical and mechanical engineering and IT roles. The sector has an above national average representation of managers, directors, senior officials and administrative and secretarial occupations, particularly in businesses operating freight terminals and cargo handling.

3.47 It is considered that the above negative perceptions of the sector could be resulting in a lack of young people seeking employment in the sector. The FTA Logistics Report (2017) sets out the findings of the FTA Logistics Industry Survey and provides an annual review of the logistics sector. Respondents to the FTA Logistics Survey considered promoting the image of logistics to young people is an important aspect of continued growth in the sector. It is understood that the average HGV driver age continues to increase, which is a cause for concern in the future. Clearly, more needs to be done, including overturning negative perceptions, for the sector to appeal to the younger generation.

4.0 QUESTION 1.1

What do you see as the key drivers to a successful freight system that is fit for the future?

4.1 The freight sector is a key contributor the economy. The FTA Report states that the annual turnover for the UK logistics sector is £1 trillion and it contributes to over £124 billion Gross Value Added (GVA) to the UK economy, equating to 11% of the UK's non-financial business economy. The UK remains a leader in logistics at a global level and is ranked in the top 10 of the global logistics performance index of the World Bank for 2016. We set out below what we consider to be the key drivers to a successful freight system that is fit for the future.

Infrastructure Investment

4.2 Targeted infrastructure investment is crucial to the future of the freight sector. This is acknowledged in the Government's Industrial Strategy Green Paper, which includes 'upgrading infrastructure' as one of the ten pillars upon which the Industrial Strategy is built. It is considered important that infrastructure investment takes place, not only in the right places, but also at the right time and links in with other wider initiatives. The Government's Industrial Strategy White Paper states:

> "Providing the right infrastructure in the right places boosts the earning power of people, communities and our businesses".

4.3 The NIC 'Congestion, Capacity, Carbon: Priorities for National Infrastructure' Report recognises how infrastructure investment can contribute to economic growth in several ways. Improving the quantity and quality of infrastructure services can lower costs for businesses. For example, a more efficient road network will reduce the cost of distribution. Infrastructure can also directly enable changes which increase productivity. For example, firms and workers are more productive when they cluster together and can benefit from agglomeration including learning, knowledge sharing, specialisation and access to deeper labour markets. Furthermore, the Government's Industrial Strategy acknowledges that improving infrastructure to deliver efficient transport systems help bring goods from suppliers to markets.

4.4 In particular, infrastructure investment for the strategic road network is considered important for the future success of the freight sector. As such, the Highways England 'Road to Growth' Report (March 2017) identifies that the freight sector relies on the road network, having the right road connections and capacity. To assist with congestion and capacity that constrains the freight sector, investment is needed to build new infrastructure and improve existing services within our urban areas.

4.5 The UK is a global leader in logistics, ranking in the World Bank's top 10, but its supporting infrastructure has been identified as weak. World Economic Forum research shows that the UK consistently underperforms its major EU-27 competitors. The UK is currently ranked 27th for the quality of its roads, 19th for its rail infrastructure and 12th and 18th for ports and airports respectively.

4.6 Some 90% of freight in the UK is moved by road therefore the road network, in particular the Strategic Road Network (SRN), is vital to enabling an efficient freight and logistics sector. Primary distribution via the SRN to and from the UK's gateway ports, airports and domestic manufacturers to distribution centres for onward secondary and tertiary movements to end destinations is key to the freight and logistics industry.

4.7 The road and rail networks need sustained long term investment in terms of maintenance, improvement schemes and new infrastructure. Investment should focus on maintaining road surfaces to minimise tyre wear and vehicle maintenance costs, enhancing capacity (particularly at pinch points to relieve congestion) and providing new junctions and links where significant journey time savings can be demonstrated.

4.8 For water freight, the priority should be the safeguarding of existing facilities i.e. wharves, transfer stations and smaller urban ports from redevelopment. The maintenance of waterways is also key i.e. dredging to maintain channel depth if water freight is to be seen as a viable alternative to road.

Effective Governance

4.9 Effective governance (including local government, combined authorities, LEPs, Quasi-Governmental organisations and infrastructure providers) should recognise the significant role that freight plays in the economy. As such, the Delivering the Goods Report recommends that plan makers and decision takers at all levels should recognise the value of logistics as an economic contributor, both in its own right and in terms of supporting other sectors linked to meeting societal demands. This is reflected in the findings of the FTA Logistics Survey, set out in the FTA Logistics Report, where respondents rated 'recognising the vital role of logistics in the economy' as one of the top actions that the Government should take.

4.10 As well as recognition of the freight sector's contribution to the economy, the Government (across all levels) needs to recognise the problems the sector will face in the future to ensure its continued success. As such, the UKWA 2017 Manifesto (Appendix 2) highlights that the supply chain and logistics community needs the support of a Government that not only understand the problems that it faces but, more importantly, is prepared to take appropriate steps to help solve them.

4.11 A joined up approach is needed from the Government to ensure the needs of the freight sector are met and future investment is focussed in the right locations. Communication between policy makers, local authorities (including their Highways authorities) business representatives, key stakeholders and infrastructure providers (e.g. Highways England and Network Rail) is vitally important to this process. The Delivering the Goods Report recognises that the Government, industry and local planning authorities must communicate openly regarding the contribution of logistics to economic growth and tailor their policies accordingly.

4.12 Effective governance will be important for the delivery of infrastructure, which we consider to be another driver for the success of the freight sector. This is recognised in the findings of the FTA Logistics Report which identifies that respondents to the FTA Logistics Survey rated investment in road improvements as the top priority they would like Government to take. The NIC 'Congestion, Capacity, Carbon: Priorities for National Infrastructure' Report highlights that private finance plays an important part in serving the UK's infrastructure needs. Furthermore, it is recognised that Government support for infrastructure investment can improve the prospects and efficiency of financing. As such, it is considered important for the Government to strengthen the conditions for private sector funding and support infrastructure investment.

4.13 Planning future economic growth in a piecemeal manner rather than a co-ordinated and holistic approach presents both a challenge and risk to the sector. Whilst the Government's Industrial Strategy seeks to raise the UK's productivity by supporting 'place-based' strategies that respond to a City Region's strengths (i.e. carving out a competitive advantage), this can be difficult to implement 'on the ground' due to local politics. For example, constituent local authorities within the same combined authority area can have very different political leanings which lead to irreconcilable differences over emotive issues such as Green Belt release. Clearly this hinders the effective operation of the Duty to Cooperate and can stifle important decisions over how the industrial strategy manifests itself spatially; particularly at the regional and sub-regional levels. This links back to the shortage of large strategic employment sites across the Country and difficulties in addressing 'larger than local' issues.

4.14 The above is evident in the West Midlands where the Mayor, Andy Street, has the task of implementing the West Midland's Industrial Strategy without the benefit of strategic planning powers. These remain under the control of the seven constituent local authorities. In Manchester, however, Andy Street's counterpart, Andy Burnham, does not have this issue as he has the benefit of spatial planning powers to allocate the land needed to implement his industrial strategy. This allows greater coordination of land use and infrastructure investment that is reflected in the Greater Manchester Spatial Planning Framework.

Delivery of Infrastructure

4.15 The delivery of major infrastructure projects is often time consuming and typically extends beyond the timescales given by national and local government administration. Consequently there is significant risk to infrastructure projects occasioned by a change of administration at a national and local level. As such, greater time and effort should be given to ensuring that there is a consensus behind key infrastructure initiatives that can benefit the freight network so that they can be delivered in a timely and efficient manner.

4.16 If there is greater confidence that a long term strategic policy environment is in place, this will encourage private investment to direct resources towards the delivery of both the physical networks and operational infrastructure required for an improved freight network.

Co-ordination of land use and infrastructure

4.17 Following on from the above, the co-ordination of land use and infrastructure planning sits at the very heart of current economic discourse. The Industrial Strategy Green Paper acknowledges that there is a need to upgrade infrastructure as a result of past failures to align planning for infrastructure with planning for housing and industry. In order to avoid the mistakes of the past, infrastructure-led growth is at the forefront of the political agenda; whether that be economic growth or housing growth. To that end, the Delivering the Goods Report recommends that a coordinated approach to infrastructure planning is required to ensure the delivery of road, rail, port, energy and digital connectivity to support the future growth in the industrial and logistics sector.

4.18 It is considered that a macro-level approach should be taken to ensure the co-ordination of land use and infrastructure. The National Policy Statement for National Networks (December 2014) provides guidance for promoters of Nationally Significant Infrastructure Projects (NSIPs) on the road and rail networks. We believe this could be updated and built upon as a starting point for infrastructure-led growth going forward. It provides a useful framework and it is for Mayors and LEPs to add flesh to the bones to ensure a co-ordinated and joined-up approach. Through discussions with key stakeholders, such as Highways England and Network Rail, decision-takers can identify key areas targeted for growth and use planning powers to assemble land around key transport hubs and motorway junctions to aid delivery.

4.19 A multi-modal analysis is required for the above to be truly effective and this can greatly improve the efficiency of freight movements. This would ensure freight hubs, ports and terminals are provided with the real estate and infrastructure they require so that their strategic potential can be harnessed and, ultimately, productivity gains can be realised. For example, the Highways England 'Road to Growth' Report (March 2017) identifies that there is increasing interest in multi-modal facilities, such as the Daventry International Rail Freight Terminal, as well as growing demand for progressively larger distribution centres built to high specifications. Furthermore, 'port-centric' developments (e.g. the London Gateway) and port capacity enhancements (e.g. Liverpool 2) have the potential to reduce traffic on the strategic road network, the former by moving the supply chain closer to ports and the latter by imports and exports entering or leaving the country closer to their final destination. Therefore, it is important that sufficient employment land is provided around key freight hubs, ports and terminals to ensure the efficient movement of freight.

4.20 A long-term, co-ordinated approach to infrastructure and land use planning is needed that factors in the timing of investment. This will ensure that supporting land uses (i.e. logistics warehouses) are delivered at the right time and do not have to wait for the requisite infrastructure to be put in place.

5.0 QUESTION 1.2

Which are the key freight corridors that matter the most? Where are the bottlenecks in the freight network, and what investments in upgrades could deliver the best value for money for freight efficiency and UK plc?

5.1 The Governments Roads Investment Strategy (1 and 2) is welcomed and is considered to cover most of the key bottlenecks and constraints on the road network. However, the funding and delivery of these schemes needs to be ensured. At a local level, highways authorities need sufficient funding to maintain and fix existing issues with their road network, which have deteriorated significantly due to austerity measures.

5.2 The decision to support the Lower Thames Crossing is also welcomed and will provide a key strategic link between Kent and Essex. The funding and delivery of this infrastructure is again critical. The continued roll out of Managed Motorways schemes across the UK is also supported to maximise existing capacity on the SRN. A permanent long term alternative solution to Operation Stack needs to be provided. It undermines the UK's ability to trade effectively with continental Europe and impacts negatively on SEGRO and its customers.

5.3 The rail freight network is also central to the success of the freight and logistics sector as an alternative to road freight for a range of commodities and products. Network capacity improvements that were not delivered by Network Rail in Control Period 5 (CP5) (largely due to the Hendy Review) need to be addressed in CP6 along with the continuation of the Strategic Freight Fund. Key priorities include: infrastructure capacity – addressing network limitations i.e. gauge clearance and direct rail access in key locations; supporting innovative ways to encourage the use of 'box and wagon' combinations which allows greater use of the existing network by rolling stock; supporting development of high capacity rail freight interchanges; and availability of efficient freight paths to improve journey times. With regard to rail freight interchanges, it is important for these to be delivered in an efficient manner and not delayed as they are important for the movement of freight.

6.0 QUESTION 1.3

To what extent are the economic benefits of freight factored into wider transport infrastructure investment planning?

6.1 The logistics sector contributes over £124 billion Gross Value Added (GVA) to the UK economy, equating to 11 per cent of the UK non-financial business economy. At present it is felt that the economic benefits of freight are not sufficiently factored in to transport infrastructure investment planning with priority given to the movement of people rather than the movement of goods. Whilst this is understandable for some infrastructure projects, for the majority freight should be given parity as a basic principle.

6.2 The Government's Roads Investment Strategy 2 and the associated Route Strategies states through its aims of economy, network capability and integration that it is prioritising the needs of freight and logistics. However, it is not clear how this is being achieved and what methodology is being applied. A potentially more effective approach would be to develop Freight Route Strategies; specifically looking at the needs of the industry and then integrating them within the wider Route Strategies.

7.0 QUESTION 1.4

What are the regulatory and legal issues that, if changed, could improve freight efficiency without increasing costs or reducing efficiency?

7.1 SEGRO's business relies upon warehousing and developable industrial land being available in the right areas i.e. with good access to transport networks, suppliers, customers and labour. Within the South East, in particular within the M25, industrial land supply has become increasingly restricted. Large amounts of industrial land have been released for redevelopment for housing, which has led to a squeeze on the availability of suitable land for industry. This in turn increases costs and reduces efficiency by forcing operators further away from their key markets. The new draft London Plan has proposed that in overall terms across London there is no net loss of industrial floorspace capacity (and operational yard space capacity). This target is to be met by either intensification, co-location and substitution of land for industry, logistics and services.

7.2 It is acknowledged that London is perhaps a unique case in this respect. However, the proposals put forward in the London Plan are welcomed and all Local Authorities should adopt similar policies if industrial land is facing similar threats.

7.3 It is recognised that the UK freight and logistics industry needs to operate in the safest, most efficient and environmentally friendly way possible, which is a fantastic challenge. One of the key potential barriers to this is inconsistency and potentially overburdening standards for emissions and vehicle design across the country. Many regions and local authorities have either implemented or proposed Air Quality Management Areas (AQMAs), Low Emission Zones (LEZ), Ultra Low Emission Zones (ULEZ – London) and Clean Air Zones (CAZ). In addition, fleet and vehicle standard schemes being implemented include: Fleet Operators Recognition Scheme (FORS), Construction Logistics and Community Safety (CLOCS) and the Direct Vision Standard (DVS). There is concern that, without common regulatory standards across these different schemes, that operators could unduly incur significant cost and not be able to operate efficiently.

7.4 The planning system is costly in relation to promoting large logistics schemes, such as strategic rail freight interchanges. The major issue is the uncertainty around the timing of the decision making process and therefore it would be beneficial if policy changes could be considered which would give greater certainty on timing. One of the advantages of the DCO process is that there is certainty over the timing of decision making. This certainty surrounding timescales should be extended to smaller schemes of regional importance where the provision of infrastructure improvements is crucial to the delivery of logistics/freight assets.

8.0 QUESTION 2.1

How has the demand for freight, and types of freight, changed over the last two decades, and what will be the drivers for changes in the future?

8.1 We have set out the how demand has changed for freight over the last two decades and the key drivers which we consider will change the future of the logistics sector below.

Globalisation and Trade

8.2 Globalisation integrates production, distribution and consumption across borders creating one market, and it is considered that this process has increased demand for freight and logistics. As global population has grown over the last two decades, demand for consumer goods and products has increased thus resulting in greater demand for trade, freight and logistics. As a result, there is demand for more efficient supply chains and freight movements to ensure demand can continue to be met.

Digitalisation and E-commerce

8.3 Following on from above, as the rise of the internet has facilitated the growth of e-commerce in recent years which has fuelled the demand for freight and logistics. Urban Logistics: The Ultimate Real Estate Challenge Report (2017) states that there is an expected rise of 94% in online sales in Europe from 2016-2021. There is a 69% forecast increase in European parcel volumes over the same period.

8.4 According to Savills, take-up of industrial and logistics space by online retailers has grown by 731% since 2008, as occupiers continue to build their supply chains to keep up with consumer demand (Appendix 3). The growth in e-commerce was also well documented over the most recent festive period with figures published showing the online behemoth, Amazon, alone acquired 4 million ft^2 in the UK in 2017: five times more space than its closest rival. As such, it is considered that the rise of the internet will continue to be a driver of change for the freight sector. Furthermore, as the rollout of superfast broadband continues, this could further increase online shopping of more rural populations who may presently be less likely to shop online due to a lack of digital infrastructure.

8.5 Online shopping has also increased the demand for faster and more efficient deliveries, with timed delivery slots and next day delivery now standard protocol. As a result logistics and freight operators have had to streamline and optimise their supply chains to ensure that faster deliveries can be guaranteed. It is considered that the e-commerce will continue to drive demand for freight and logistics in the future.

Last Mile (Urban Logistics)

8.6 Linked to the above, the effect of e-commerce on the supply chain and to need to respond to consumer demand has resulted in requirements for last mile logistics facilities in suitable urban locations near to consumers. As such, in recent years e-commerce retailers have included smaller urban warehouses in their supply chain/portfolio in order to shorten delivery routes and to achieve quick delivery times for online customers.

8.7 However one of the drivers for the freight sector in the future will be the ability for last mile logistics facilities to be delivered to help meet growing demand for e-commerce deliveries. As highlighted in our response to Question 1, industrial land has been lost at an alarming rate and any existing industrial land in urban locations suitable for last mile logistics facilities is facing competition from other land uses, such as housing. To ensure, last mile logistics facilities can be delivered it is considered that an increasing emphasis needs to be placed on protecting existing industrial land and the allocation of new industrial land in suitable locations.

8.8 Furthermore, it is considered that the delivery and operation of last mile logistics facilities will also have to respond to increasing concerns surrounding congestion and air quality in urban areas. For example, congestion charging or clean air zones being implemented in urban areas in the future could impact upon the freight sector disproportionately and how last mile logistics facilities operate.

First Mile (National Distribution Centres/Regional Distribution Centres

8.9 Also linked to the growth of e-commerce, the increasing need to move vast volumes of goods at a fast pace has also resulted in requirements for larger distribution centres built to higher specifications. As such larger warehouses have continued to grow in recent years, with new warehouses typically 35% larger than traditional high-bay warehouses. This is reinforced in the BPF 'Delivering the Goods' Report which recognises that first mile logistics solutions, such as national and regional distribution centres, are getting larger in terms of floorspace and last mile solutions are becoming ever more flexible and innovative to respond to consumer demand. Furthermore, the Colliers 'From First Mile to Last Mile' Report (2015) (Appendix 8) identifies that there is a noticeable trend that the overall size of the total floor area is getting larger for first mile distribution facilities which can comprise a floor area of more than 100,000m². The Colliers Report states:

> "In fact, e-retailing is growing so fast, facilities need to be designed with expansion space built-in, given the distinct possibility that a retailer's needs will have outgrown the facility by the time it is ready. In many markets, this putting significant pressure on what are already very tight land and planning conditions".

8.10 It is therefore considered that existing first mile distribution centres will have to be adapted/extended to meet increased demand. Furthermore, it is considered important to future proof first mile distribution centres coming forward to ensure demand from e-commerce can be met.

Resurgence of the Port

8.11 Ports, whether relating to sea, air or rail, have been key drivers for the freight sector. Importantly, the NIC 'Congestion, Capacity, Carbon: Priorities for National Infrastructure' Report highlights that ports and airports support international competiveness by enabling the export and import of goods. Furthermore ports handled over 95% of goods by volume passing through UK international gateways in 2015, with airports predominantly carrying high value and time critical goods.

8.12 Furthermore, the Highways England 'Road to Growth' Report (March 2017) states:

> "As an island nation, international trade has been important to the growth of the economy. The UK is critically dependent on its ports, airports and the Channel Tunnel, and the SRN is fundamental in facilitating these international movements".

8.13 It is therefore considered that investment in the strategic road network and infrastructure that connects ports to the UK's major centres of population will be a key driver for success in the freight sector in the future. For example, this will be important for the expansion of Heathrow Airport. The expansion of the airport will double cargo volumes and it will be important that sufficient supporting facilities to handle cargo and infrastructure investment is provided to ensure there is capacity on the network to handle this additional freight.

Modal Shift

8.14 Modal shift from road to rail is considered be a key driver for the future of the freight sector. However, there is a risk that the opportunities afforded by rail will not be delivered if implementation strategies are not aligned with established policies. There is a need for a network of SRFIs across the country and in order to do this, planning consent needs to be secured for major freight transport hubs and the ability to integrate hubs within the rail network needs to be prioritised.

Climate Change

8.15 In the last two decades, climate change and the need to lower carbon emissions has become a prevalent issue. Freight is seen as one of the key contributors to congestion which in turn leads to issues associated with air quality.

8.16 As stated above, congestion charging and low emissions zones being implemented in urban areas could impact on the operation of freight in the future. It is important to recognise that freight relies on the road network, and given the routing of freight vehicles on roads that would likely fall within congestion or low emission zones, they would be hit disproportionately hard. As such, it is considered that the implementation of congestion and low emission zones should take into account recent evidence related to the types of vehicles responsible for local air quality problems.

Technological Advancement

8.17 Linked to the above, alternative fuels and technologies and the electrification of vehicles are considered to be a potential driver for change in the freight sector in the future. It is important to recognise that current technology is more feasible for the electrification of a fleet of LGVs rather than HGVs. Furthermore, other issues with electric vehicles currently include: high procurement costs; limited range of electric vehicles; limited mileage range; and necessity to adapt fleets to have charging infrastructure. The current issues associated with electric vehicles makes it difficult for freight businesses to electrify their fleet.

8.18 With regard to both electric delivery vehicles and alternative fuels for HGVs and LGVs, the availability of infrastructure needs to be considered. Currently the infrastructure for these types of vehicles is not readily available which makes it difficult for the freight industry to make a transition. Furthermore, the end-destination of freight vehicles needs to be taken into account. In particular, the adequacy of infrastructure (e.g. charging points) at the end-destination, for example vehicles not being able to re-charge to complete the return journey if the end destination does not have similar air quality policy in place. These issues would result in these types of vehicles being impractical, operationally inefficient and unviable for the freight industry. As such, sufficient infrastructure for electrification of HGVs will need to be put in place across the country for the freight sector to make a transition in the future.

8.19 In light of the above, it is considered that the transition from conventionally powered diesel vehicles towards electric vehicles in the freight industry will not be an easy one. As such, support and a long transitional period is needed.

Brexit

8.20 Brexit will result in a switch of trading patterns from the EU to more distance sourcing and consumption markets will lengthen supply chains and increase the need for safety stock holdings to ensure continuity of supply. The UKWA Manifesto (September 2017) identifies that it is expected that Brexit will increase the demand for warehousing, placing further pressure on land use and planning policy:

> "Whatever the eventual outcome of Brexit, a totally "frictionless" trade to and from Europe is not expected, and potential interruption in existing seamless logistics flows is likely to be mitigated by buffering of stock. A switch of trading patterns from EU to more distance sourcing and consumption markets will also lengthen supply chains and increase the need for safety stock holdings to ensure continuity of supply. It is expected therefore that Brexit will increase the demand for warehousing, placing further pressure on land use and planning policy. Some of the additional space required may be sought in or near to port locations, depending on the final arrangements for frontier declarations, inspections and security measures imposed on export and import freight."

8.21 The FTA Report notes that the biggest concerns for the sector regarding future trading with the EU is tariffs on UK imports as well as additional red tape as a result of new customs procedures.

8.22 Clearly, getting the conditions for the movement of goods and services right will be essential for a successful Brexit and imperative for the UK's future prosperity.

Automation and Electric Vehicles

8.23 Technologies such as automation and electric vehicles will change the future of the freight sector. As such it is considered that the right level of priority is afforded to the provision of utility supplies (i.e. electricity) to the preferred locations to ensure these technologies can be fully utilised.

9.0 QUESTION 2.2

How is the freight industry planning for future changes in the demand? What levers might be available to shape future demand for freight transport?

Technology

9.1 The introduction of technology is becoming apparent across nearly all industries and the freight industry is no exception. As consumer demands have changed, there has become a greater strain on the freight industry to provide on either a next or same day basis. However, as technological advances increase for the consumer through the advances in online shopping and the ability to order goods as and when at the touch of a button becomes more common, the range of technological advances for suppliers and the freight industry also increases.

9.2 As noted in the 'How soon is Now' report by Addleshaw Goddard, there are a number of technological advances available that can help shape demand for future freight transport. The options included within the report are the automation of stock picking, ordering of supplies or the management of space and staff. Implementing these technologies would result in the management systems and processes becoming more efficient and in turn a more responsive and efficient freight industry able to cope with increasing consumer demand.

9.3 Amazon employs some 45,000 robots worldwide in more than 20 of the company's largest fulfilment centres. Amazon's UK automated facilities include Manchester and Tilbury. Orange robots 16 inches tall, slot underneath stacks of goods in storage units and carry their loads to operators located in a caged perimeter where goods are accessed by staff for onward delivery.

9.4 The trend for warehouse and order fulfilment automation will continue. Ocado, the UK online grocer, uses automation developed in-house to store and retrieve items. Credit Suisse believes the human element of the process could be eliminated within a decade.

Strategic Road Network

9.5 The Strategic Road Network (SRN) is an integral part of the freight network, enabling freight to be moved more efficiently over longer distances. As the need to move freight faster arises to align with consumer demand and the requirement for goods on a same day/next day basis, it is necessary that improvements to the strategic road network match these ambitions and greater capacity is provided.

9.6 It will be necessary going forward for the freight industry to support any improvements to this network and to utilise the SRN as efficiently as possible. Previously mentioned were the enhancements to vehicle technologies. These included Lorry Platooning and the use of alternative fuelled freight vehicles. The Lorry Platooning would help create a more efficient use of space along the SRN, which could result in less congestion and therefore a more efficient network.

9.7 Greater efficiency will also be achievable with the continued roll out of Smart Motorways. Smart motorways are a Highways England initiative providing extra capacity on the SRN through opening up the hard shoulder on either a permanent or peak time basis. Technology is used to monitor traffic conditions and where congestion is occurring speed limits can be reduced in order to increase traffic flow.

Political Lobbying

9.8 It is considered that political lobbying to raise the profile of the freight sector will be important to shape the future of the freight sector. It is considered that the profile of the freight sector can be raised through the Government's Industrial Strategy; work undertaken by the National Infrastructure Commission and the British Property Federation; and combined authorities and LEPs introducing policies or initiatives to support the freight sector. Political lobbying will ensure that the needs of freight are considered and taken into account.

Legislation

9.9 It is considered that legislation, such as Nationally Significant Infrastructure Projects (NSIPs) and Development Consent Orders (DCOs), are useful levers to help shape the future of the freight industry.

9.10 NSIPs in the transport sector include:

- new roads which are to form part of the strategic road network (motorways and trunk roads) operated by Highways England (above certain thresholds);
- new railway lines in England which are to be operated by Network Rail (above certain thresholds);
- new rail freight interchanges over 60 hectares in area in England;
- new large scale harbours in England or Wales; and
- new airports in England capable of handling at least 10 million passengers per year.

9.11 DCOs are the means of obtaining planning permission for developments categorised as NSIPs. Introduced by the Planning Act in 2008, DCOs were intended to simplify and speed up the process of obtaining planning permission for NSIPs.

9.12 As such, NSIPS and DCOs provide legislation for key infrastructure to be developed that will support the future of the freight sector.

10.0 QUESTION 3.1

How does congestion impact upon the productivity and economic contribution of freight? To what extent does congestion affect changes to mode, time or other freight choices?

10.1 Data from the Freight Transport Association (FTA) shows that the challenge of congestion is significant and set to increase. The cost of congestion for an HGV is calculated by FTA at £1 a minute, meaning that it is a costly factor in servicing urban areas. It also has the effect of increasing emissions from vehicles. The data company Inrix has found that the UK tops the list of the most traffic-congested EU cities.

10.2 Congestion can encourage a switch from HGV to vans due to a perception of greater agility and speed. However, in reality this can actually increase congestion with around 6-7 vans with a payload of 1.5t needed to deliver the same 10t payload as an 18t (GWV) rigid lorry.

10.3 Congestion can also make other alternative modes appear more attractive as they are more resilient to the effects of congestion. This includes cycle logistics for deliveries and the use of river and rail networks for certain journeys and commodity types.

10.4 Congestion problems has also prompted a response from both industry and policy makers. In particular, an attempt to facilitate retimed deliveries, which equates to moving deliveries away from the peak network hours and trying to make the most of the 24 hour delivery window. The Retiming Delivery Consortium set up in London has had notable success and has produced guidance aimed at addressing the concerns of all stakeholders. It has also produced quiet deliveries guidance aimed at addressing specific noise issues.

11.0 QUESTION 3.2

How does congestion affect the environmental impacts of the movement of freight?

11.1 Congestion is increasing, particularly in and around major cities. Congestion often results in delays and for the movement of freight. Congestion can lead to the constant acceleration and braking of stop-and-go traffic which burns more gas, and therefore pumps more pollutants into the air. This is reinforced through the FTA Logistics Report which confirms that stop-start traffic has a significant impact on fuel consumption, emissions and air quality. The FTA Logistics Report further states:

> "According to information supplied to the FTA by manufacturers, a comparison of an HGV travelling at 30mph that stops 3 times in a mile and then gets back up to speed, and one that cruises at 30mph, shows a tripling of emissions".

11.2 Given that the majority of freight is transport by road, and often in urban areas, congestion can result in freight movements impacting upon increased levels of poor air quality. As such, reduction in congestion would also reduce emissions and improve air quality.

12.0 QUESTION 3.3

With limited space for new infrastructure, how can we better use our existing urban network to support freight? Are there changes – such as changes to modes, methods, or delivery times - that could help reduce the stress on the urban transport network?

Modes and Methods

12.1 New delivery methods are emerging constantly and it is anticipated that this trend will continue as technology develops. Road has the largest mode share in terms of distributing freight, with rail and water also being used to a lesser extent. The use of barges on rivers and canals to transport goods, especially construction materials, is a way in which congestion on the road network can be alleviated. Barges have a much greater load capacity than lorries i.e. one barge can accommodate the same as 17 HGVs for moving aggregate.

12.2 Mode changes are also being seen within the 'last mile' part of the delivery. Where previously this would have been completed by vans, particularly for smaller deliveries, cycle deliveries are now becoming more common place. This is evident in Europe where this alternative delivery method is already well established. Large firms such as DHL, UPS and TNT all have existing cycle networks within their supply chain. Smaller independent companies, such as TXITA in Spain and Outspoken in the UK, have also established cycle logistics operations. Using cycles provides a quick and emission free way of delivering that is also not as vulnerable to congestion as other larger vehicles.

12.3 Similar to this is the introduction of drones as a method of also completing the 'last mile' of the delivery process. Technology is ever evolving in this sector, with new ideas of how drones can operate emerging. The benefits of this is that there is no additional pressure on urban highway networks, although the mass market appeal and application of such technology is unknown at present.

12.4 In the UK, Hermes is trialling self-driving delivery robots. The courier firm has deployed a number of Starship Technologies' six-wheeled robots on the streets of the London Borough of Southwark. The autonomous machines, which have a top speed of 4mph, are 55cm tall and 70cm long, and weigh 18kg. They can carry up to 10kg at a time, with packages stored inside a secure compartment that can be unlocked with a code sent to the customer's phone. The bots have also been used for food delivery in Greenwich, London by online takeaway company Just Eat.

Delivery Times

12.5 Across the UK, out of hours or re-timed deliveries have been steadily increasing. Numerous retailers, including New Look, Pets at Home, M&S, Sainsbury's, Tesco, and Boots, and their logistics providers have implemented re-timed deliveries. This has generally occurred where access to the receiving store delivery is either 24 hour or access can be achieved via a key or access code. The potential to re-time deliveries depends on a number of factors including access constraints, noise abatement linked to local residents, planning restrictions and delivery efficiency. It is also considered that the use of urban consolidation centres will assist in programming when deliveries can be made thereby ensuring that the available infrastructure is used efficiently across a 24 hour period.

13.0 QUESTION 4.1

Are there efficiencies within freight management and distribution practices that could help reduce the CO_2 and NOx emissions from freight?

13.1 The freight and logistics sector will always seek to operate in the most efficient way possible due to tight margins. However, there are improvements that can be made in management and distribution practises that can reduce CO_2 and NOx emissions including:

- Utilising big, real time data to increase supply chain visibility and optimisation to increase efficiency.
- Order consolidation software to minimise vehicle trips.
- Vehicle routeing software to minimise vehicle kilometres travelled.
- Switching to alternative fuels and vehicles and utilising cycle logistics where practicable.
- Vehicle design to minimise air resistance and reduce fuel consumption.
- Facilitate more out of hours and overnight freight movements – reducing congestion on the road network at peak times and subsequently emissions.
- Continue to facilitate the switch to rail freight for a greater range of commodities, origins and destinations and journey lengths.
- Delivery consolidation in all of its forms as shown in the table below.

Consolidation Centres (CC)	Receiver Led Consolidation	Operator Led Consolidation	Delivery Point Consolidation
High street CC Shopping centre CC Micro-CC Construction CC Hospital CC Office CC	Upstream consolidation between suppliers / retailers Procurement-based consolidation Storage-based consolidation Out-of-hours deliveries	In-house consolidation operations Virtual consolidation between carriers Primary distribution consolidation Freight exchange systems Waste / recycling consolidation	Locker banks Collection points Unattended delivery boxes

14.0 QUESTION 4.2

What role do alternative fuels such as electricity, Liquid Petroleum Gas and biofuels have to play? What are the barriers and challenges to wide-scale uptake of alternatives to diesel and what could be done to help remove these issues?

14.1 The switch to alternative fuels is a necessity to address air quality issues. There are currently a variety of barriers to the wide scale adoption of these fuels and vehicles. The LoCity programme set up to help industry prepare for the introduction of the ULEZ in London has investigated this topic and a summary of the findings is set out below.

Barriers to all stakeholders

- Lack of clarity around priorities and definitions for "low emission" commercial vehicles
- No clear, long term policy framework for alternatively fuelled commercial vehicles

Barriers for fleet operators

- Lack of suitable alternatively fuelled vehicles – range, payload, power, lead times
- Insufficient public infrastructure – refuelling infrastructure across all fuel types
- Uncertainty around vehicle performance and whole life costs
- Lack of motivation (internally or from customers) to go beyond Euro VI / 6 for commercial vehicles (especially HGVs) and (for those that are motivated), desire for guidance on which technologies will be supported by local and national government

Barriers for vehicle manufacturers

- Low demand and not enough policy support or clarity on timescales to provide confidence that technologies will be supported through to mass markets
- High component costs (fuel cell, hydrogen tanks and latest battery technologies)
- Current technology limits range and payload e.g. energy density of batteries to date is not high enough to allow long driving ranges while maintaining payload, hydrogen tanks are only available in certain size and shapes.

Barriers for infrastructure providers

- Difficulty establishing core demand to make business case
- Availability and cost of land (especially in urban areas)
- Length of planning permission process

Recommendations for policymakers

- Develop a consistent policy framework for commercial vehicle emissions.

- Define targets and timescales for reductions going beyond Euro 6 / VI standards;
- Define “low / ultra low emission” in a way that is applicable to a range of technologies;
- Implement policy at national and local level that is consistent and provides financial and non-financial incentives for use of AFVs that go beyond Euro 6 / VI standards.

Recommendations for fleet operators, vehicle manufacturers and infrastructure providers

- Industry stakeholders should engage with policymakers to help define targets, timescales and measures that will support market development and reduce emissions
- Fleet operators and infrastructure providers should work together to align timings and locations of AFV adoption and infrastructure deployment.
- Fleet operators and infrastructure providers should engage with and participate in trials of innovative technologies to demonstrate real-world applicability and provide evidence of cost and emissions savings
- Information sharing: fleet operators should share information on AFV performance and costs in specific applications; infrastructure providers should communicate fuel pricing; vehicle providers should advertise emissions savings in line with national definitions of low emission and ultra low emission vehicles.

14.2 More information and reports available on programme website: https://locity.org.uk/

15.0 QUESTION 5.1

How will new technologies change the capacity and performance of the freight transport network? Over what timeframes might these new technologies begin to affect the freight transport network?

15.1 Enhancements in capacity and performance of the freight transport network are likely to go hand in hand with improvements to the overall transport network allowing freight and logistics operations to work more efficiently. The introduction of Connected and Autonomous Vehicles (CAVs) is likely to have the single greatest impact. In May 2016 the Government published a research paper on the impacts of CAVs on traffic flow.

15.2 The research suggested that substantial benefits in journey times, reliability, delay and congestion were likely, but may not be achieved until high levels of connectivity and automation are achieved i.e. depending on the level of penetration (uptake) of CAVs in the overall vehicle fleet.

15.3 The report states: 'There is potential for significant benefits to network performance, particularly in high-speed, high-flow, congested situations. However, there is evidence that at low penetrations, any assertive CAVs are limited by the behaviour of other vehicles; that vehicles are not able to make use of their enhanced capability. This leads to suggestion of a tipping point – the proportion of enhanced vehicles required before major benefits are seen. This work suggests this may be between 50% and 75% penetration of CAVs. Results for the strategic road network model indicate improvements in delay of 7% for a 50% penetration of CAVs, increasing to 17% for 75% penetration and as high as 40% for a fully automated vehicle fleet. Furthermore, benefits are greatest in congested networks, which are constrained by level of traffic density that can be achieved.'

15.4 Within an urban setting the research suggests initial benefits to delay of more than 12% with a 25% penetration of CAVs, rising to 30% with a fully automated vehicle fleet. Furthermore, the scale of improvement in reliability far outweighs that shown in general performance – in the urban model, benefits of between 30% and 80% are shown with a 25% penetration of CAVs, dependent on the demand situation. The timescales for CAVs to be available to the mass market and adopted by end users varies considerably. The government wants to have driverless cars on British roads by 2021 and plans to make further changes to regulations to support this. However, it is likely that it will be later in the 2020s before the level of penetration reaches levels where the benefits in transport capacity can be fully realised.

16.0 QUESTION 5.3

How do you see technologies such as HGV platooning, digital railway signalling, and autonomous vehicles being integrated into freight distribution?

16.1 A DfT and HE sponsored on-road HGV platooning trial is set to go ahead in the UK in 2018 through of consortium of TRL, DAF, Ricardo and DHL. The trial will collate the evidence required to understand issues such as fuel efficiency and emissions, safety, acceptance by drivers and other road users, implications for future infrastructure, and the commercial case for adoption. The trial will help with proof of concept for platooning and outline the next steps for integration in to business as usual practices for logistics operators.

16.2 For autonomous vehicles much of the focus has been on passenger cars, the benefits of moving to autonomous technology could be good for logistics companies operating on tight margins. Autonomous vehicles could help alleviate the driver shortage the industry faces, but the big savings, is more likely to be in reduced fuel costs, emissions and (especially with fully autonomous vehicles) the potential for 24hr utilisation of vehicles.

16.3 Autonomous vehicles will not operate in isolation, they will be in constant contact with fleet operating systems, allowing more accurate tracking, adaptive planning and allocation of resources, scheduling and routing. Autonomous freight technology will likely bring new players into the freight and logistics market, who will believe they can compete with existing businesses by offering a new business model.

16.4 Digital signalling is already deployed on parts of the rail network and will be in service from 2018 on the new Thameslink and Crossrail routes. It is key to enabling more train paths and it's roll out across the network especially where there are capacity constraints is considered essential to increasing the potential for rail freight.

17.0 QUESTION 5.4

How might regulations and physical infrastructure need to adapt to new technologies and business models in the freight sector?

17.1 Facilitate the provision of alternative refuelling infrastructure i.e. electric vehicle rapid charging points as well as hydrogen and LPG refuelling stations.

17.2 Ensure all new developments provide sufficient loading / unloading and servicing facilities ideally off-street to allow the development to function efficiently when operational.

17.3 Local Authorities should show greater flexibility on delivery hours in urban areas. Working collaboratively with all stakeholders in particular residents to alleviate noise concerns and facilitate out of hours' deliveries. Physical infrastructure improvements can also help i.e. secure unattended delivery facilities within retail, offices and homes.

17.4 Safeguarding industrial land in urban areas or being agile with land use. In particular relating to warehousing in smaller urban locations, from 50-1,500 sq ft to facilitate last mile operations with quick fulfilment and replenishment. In December 2017 Savills reported a 731% increase in demand for industrial and logistics space by online retailers since 2008, an indication of a decade in which Black Friday and Cyber Monday surged in popularity and awareness in the UK.

17.5 Ensure regulations does not stifle technology bringing new (disruptive) players into the freight and logistics market, who will believe they can compete with existing businesses by offering a new business model. However, workers' rights need to be protected at the same time from the potential impacts of the gig economy. In November 2017, research from Hampshire Trust Bank recorded a 41% rise in the number of SMEs in the transport and distribution sector over the previous five years. The segment ranks top in terms of optimism for the future, with 60% of those surveyed expecting good long-term economic prospects in the years to come. As service demand increases, it seems that more and more entrepreneurs are taking advantage of fulfilling the service gap.

APPENDICES

Appendix 1: Estates Gazette Market Overview Presentation (November 2017).

[Appendix removed to manage document length]

Appendix 2: United Kingdom Warehousing Association (UKWA) 2017 Manifesto.

[Appendix removed to manage document length. UKWA 2017 Manifesto available at https://www.ukwa.org.uk/wp-content/uploads/2017/10/UKWA-Manifesto-September-2017-Why-logistics-is-important-to-the-UK-economy.pdf]

Appendix 3: Savills Article dated 4th December 2017.

[Appendix removed to manage document length. Article available at https://www.savills.co.uk/insight-and-opinion/savills-news/225528-0/take-up-of-industrial-space-by-online-retailers-grows-by-731--in-under-a-decade]

Appendix 4: SEGRO's Keep London Working Report (February 2017)

[Appendix removed to manage document length. Report available at http://www.segro.com/~/media/Files/S/Segro/documents/Keep_London_Working/SEGRO-Keep-London-Working_Report.pdf]

Appendix 5: The Ultimate Real Estate Challenge Report.

[Appendix removed to manage document length. Report available at http://www.cushmanwakefield.co.uk/en-gb/research-and-insight/2017/urban-logistics]

Appendix 6: The Last Mile.

[Appendix removed to manage document length]

Appendix 7: North Northamptonshire Joint Core Strategy (July 2016), Policy 24 (Logistics).

[Appendix removed to manage document length. Core Strategy available at http://www.nnjpu.org.uk/publications/docdetail.asp?docid=1573]

Appendix 8: Colliers 'From First Mile to Last Mile' Report (2015).

[Appendix removed to manage document length. Available at http://www.colliers.com/en-gb/-/media/Files/EMEA/emea/research/industrial-and-logistics/CollierFromFirstMiletoLastMileGlobalLogisticsEuropean%20Version]

The questions the Commission is particularly keen to focus on in this initial phase of work are as follows.

You may wish to respond to all or any of the below:

1. What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?

Warwickshire County Council (WCC) considers that one of the key constraints to movement of freight is dealing with congested highway networks (see 1.2 below)

1.1. What do you see as the key drivers to a successful freight system that is fit for the future?

We consider that better driver facilities (such as authorised parking areas) would help to reduce the incidence of dangerous or inconsiderate HGV parking, road safety issues and anti-social behaviour. We suggest that the NIC should consider how better driver welfare and safety along with greater security for vehicle loads can be provided across the UK.

As the demand for freight transport increases, the requirement for services/facilities for drivers will also increase. This along with the legal requirements drivers need to meet with regard to rest breaks is likely to exacerbate the types of issue described above for local councils, residents and businesses.

In 2011, DfT commissioned AECOM to undertake a lorry parking study which demonstrated that there was significant demand for lorry parking across England coupled with a high level of recorded crime. Lack of provision in this area is likely to be detrimental to the UK having an overall effective freight system and needs to be considered alongside the other questions posed.

1.2. Which are the key freight corridors that matter the most? Where are the bottlenecks in the freight network, and what investments in upgrades could deliver the best value for money for freight efficiency and UK plc?

Warwickshire County Council (WCC) produces an Advisory Lorry Route Map which is available at https://apps.warwickshire.gov.uk/api/documents/WCCC-764-38.

Figure 1 [not included due to file size] shows HGV concentrations as a proportion of total traffic flow and the examples listed below highlight some of the key freight corridors where HGV volumes are particularly significant:

- **A435 Studley (de-trunked in 2008)**
- **A46 west of Warwick and at M40 Junction 15 (Longbridge)**
- **A46 between Tollbar Island and Walsgrave Junction east of Coventry**

- **A46 south of Alcester**
- **A5 north of Nuneaton**

WCC is working with Highways England to secure improvements on the A5 and A46 corridors on the Strategic Road Network (SRN).

The A46 is critical to the performance of the sub-regional economy of Coventry and Warwickshire. The route forms a strategic north east-south west corridor linking a number of key employment sites at Ansty (Rolls Royce, London Taxi Company), Ryton (Prologis Park, which includes Freeman, Network Rail and UK Mail/DHL), Whitley (Jaguar Land Rover), Stoneleigh (University of Warwick and Stoneleigh Park) and Warwick (Volvo). The corridor is a focus for major housing growth and will also be the location for the forthcoming National Battery Development facility.

Like the A46, the A5 plays a significant role in supporting the economy of the sub-region, particularly in parts of Northern and Eastern Warwickshire where the logistics sector is well represented at Hams Hall, Birch Coppice, Sketchley Meadows, Magna Park and DIRFT. The Horiba-MIRA vehicle research and development facility is also located on the A5 between Nuneaton and Atherstone, which is one of the highest performing Enterprise Zones within the UK.

Highways England's indicative Network Classification plan shows the A46 between the M6/M69 and M40 as a potential future Expressway. The investment during RIS1 and into the early years of RIS2 combined with the forthcoming Local Authority led improvements at Stoneleigh, Thickthorn (Kenilworth) and Stanks (Warwick) in Warwickshire will contribute significantly towards the overall Expressway proposition. However the section of the A46 between the M40 and M5 is not currently identified as a potential future Expressway. The Midlands Connect Strategy - Powering the Midlands Engine (March 2017) includes an aspiration for an A46 Expressway in full between Lincoln and Tewkesbury, which would improve strategic connectivity from the East Midlands to the South West and provide resilience to the M42 and M5.

The A435 linking Junction 3 of the M42 with the A46 near Alcester was formerly part of the SRN but was de-trunked in 2008 and is subject a 30 mph speed limit within Studley as shown on Figure 2 [not included due to file size]. However, the route still carries significant traffic volumes with a high proportion of HGVs which have a negative environmental impact on local village communities of Mappleborough Green, Studley, Coughton and Kings Coughton. The A435 is included in DfT's indicative Major Road Network (MRN) and WCC is proposing to commission a study to consider the scope for a series of potentially substantial transport improvement options along the corridor in advance of funding for the MRN becoming available from 2020/21.

1.3. To what extent are the economic benefits of freight factored into wider transport infrastructure investment planning?

All major transport schemes (excluding those solely related to development mitigation) delivered in Warwickshire require business cases to demonstrate the Value for Money linked to scheme delivery. These assessments include a BCR Benefit Cost Ratio assessment which considers the benefits and costs for all vehicles/users which are affected by the proposals based upon their relative Vehicle Operating Costs (VOCs) and Value of Time (WCC use Paramics and PEARS add on for most of their economic assessments, and other assessment tools such as TUBA are available). VOCs are vehicle specific and therefore the benefits linked to HGVs using the scheme are embedded in this calculation. The actual benefits linked to HGV movements can be derived through reviewing the Transport Economic Efficiency tables which accompany these assessments.

Where a scheme provides key benefits to employers such as large distribution centres, the benefits linked to the scheme in addressing capacity and enabling economic growth will be explicitly referenced in the economic narrative of the bid.

1.4. What are the regulatory and legal issues that, if changed, could improve freight efficiency without increasing costs or reducing efficiency?

No response

2. How might the demand for freight develop and change over the next 20-30 years?

The freight industry will have a more informed view on this. However we would expect freight demand to increase in line with population increase. We would hope that alternative means more suited to urban environments are developed and utilised.

2.1. How has the demand for freight, and types of freight, changed over the last two decades, and what will be the drivers for changes in the future?

Warwickshire and neighbouring authorities have seen a significant increase in the number of planning applications for major expansion of existing logistics and distribution facilities, such as Magna Park in Leicestershire and Daventry International Railfreight Terminal (DIRFT 3) in Northamptonshire which are both served by the A5. These sites are located within the Midlands' Golden Triangle of logistics activity which is served by the M1, M42 and M6 motorways.

There are committed proposals for new or expanded employment in the automotive sector at Jaguar Land Rover (JLR) World Headquarters at South Whitley on the A46 corridor near Coventry and at JLR Gaydon in South

Warwickshire which is proposed for expansion. New distribution facilities are also proposed at Redditch Eastern Gateway on the A435 corridor in West Warwickshire as shown on Figure 3 [not included due to file size].

The area has been subject to speculative development at Ryton (Coventry) and Birch Coppice (Dordon, near Tamworth) in 2013. Inter-modal freight terminals at Birch Coppice and Hams Hall are also located in North Warwickshire.

2.2. How is the freight industry planning for future changes in the demand? What levers might be available to shape future demand for freight transport?

No response

3. What effects does congestion have on the efficiency of freight movement and emissions?

See responses below

3.1. How does congestion impact upon the productivity and economic contribution of freight? To what extent does congestion affect changes to mode, time or other freight choices?

Congestion will have a major impact on freight which needs to be transported during peak hours. Impacts on Vehicle Operating Costs can be very significant when multiplied across the year. This is often demonstrated through analysis of supporting modelling and economic assessments used to inform highway scheme business cases. Changes to time of travel could have very significant impacts on reducing these effects.

3.2. How does congestion affect the environmental impacts of the movement of freight?

Congestion on key freight corridors such as the A435 in West Warwickshire can have significant negative environmental impacts on local communities, including the effects of noise, vibration, severance and poor air quality. In 2006, an Air Quality Management Area (AQMA) was declared in Studley due to exceedances of the nitrogen dioxide annual mean objective. Road traffic accounted for two thirds of roadside NOx and nitrogen dioxide with HGVs contributing approximately half. However the A435 is major freight corridor and is likely to come under further pressure as large scale development at Redditch Eastern Gateway comes forward.

Options to address this congestion are currently constrained by the built up environment and the significant scale of funding required to deliver substantive off-line transport infrastructure improvements. HGVs are a major contributor to air quality impacts due to their dependence on diesel fuels which emit the more harmful particulate pollutants.

3.3. With limited space for new infrastructure, how can we better use our existing urban network to support freight? Are there changes – such as changes to modes, methods, or delivery times - that could help reduce the stress on the urban transport network?

Yes, distribution hubs which would allow goods to be transferred to smaller LGV type vehicles, more suited to the urban environment should be a consideration.

Timing deliveries outside the peak periods of congestion should also be a major consideration as peaks are generally restricted to a very limited period of the day.

4. How can freight lower its carbon and air quality impacts?

Most air quality impacts will be experienced in urban environments where speeds are lower, the likelihood of experiencing congestion is greater and the built up environment results in a canyon effect which exacerbates air quality impacts. Focussing on highway schemes, technologies and choice of mode in these areas would have the greatest effect on air quality.

4.1. Are there efficiencies within freight management and distribution practices that could help reduce the CO2 and NOx emissions from freight?

Choice of mode and utilising vehicles more adapted for built up environment may help address some of these issues.

4.2. What role do alternative fuels such as electricity, Liquid Petroleum Gas and biofuels have to play?

WCC is supportive of alternative fuels as a mechanism for addressing these impacts. WCC has an adopted electric vehicle policy around charging infrastructure and will be looking to widening this to cover all modes and autonomous vehicles in the forthcoming LTP review.

What are the barriers and challenges to wide-scale uptake of alternatives to diesel and what could be done to help remove these issues?

From experience with working with encouraging use of electric cars, the major challenges are related to the provision charging infrastructure and compatibility of infrastructure with the battery technologies adopted. Government legislation may help with this.

4.3. What technologies could best and most realistically be utilised to manage the carbon impacts of freight, both within urban areas and on longer strategic journeys?

Wider adoption of SMART/Managed motorways will have a positive impact on air quality. This technology smooths out the flow of traffic, reducing the need

for regular start stops and “phantom jamming” which will be major contributors to air quality impacts, especially for HGVs.

Electric and Autonomous vehicles (especially if platooning) will also have positive benefits but are likely to take much longer to be realised.

5. How could new technologies be utilised to increase the efficiency and productivity of UK freight?

No response

5.1. How will new technologies change the capacity and performance of the freight transport network? Over what timeframes might these new technologies begin to affect the freight transport network?

No response

5.2. How can the use of data such as real-time traffic information by artificial intelligence and machine learning systems help to improve freight efficiency and productivity? How might this affect the business models and requirements of freight in the future? Are there any barriers to the greater use of data in freight?

No response

5.3. How do you see technologies such as HGV platooning, digital railway signalling, and autonomous vehicles being integrated into freight distribution?

The Coventry and Warwickshire area is involved in the development of new technologies such as Connected and Autonomous Vehicles and we would like to gain an understanding of how these might be integrated into the freight distribution sector.

5.4. How might regulations and physical infrastructure need to adapt to new technologies and business models in the freight sector?

No response

*6. Are there good examples internationally of freight systems, policy, infrastructure or technology development and implementation that the UK can learn from to increase freight efficiency and/or reduce the carbon a*nd congestion impacts?

No response

NIC Freight Call for Evidence

Response from the Independent Transport Commission

March 2018

The Independent Transport Commission (ITC) welcomes the work that the NIC is undertaking on freight. This is a relatively neglected area of transport policy and yet essential to the functioning of the UK economy. The ITC maintains a freight work stream as part of its portfolio of research.

As an evidence-based organisation, it is the policy of the ITC only to respond to consultation questions where we have hard evidence or have undertaken research. Those Call for Evidence questions where we have relevant information to form a judgment are given below.

Q1.2 What are the key freight corridors that matter the most? Where are the bottlenecks in the freight network, and what investments in upgrades could deliver the best value for money for freight efficiency and the UK economy?

The ITC has not conducted a thorough assessment of the major freight corridors in the UK. However, our research has indicated that significant bottlenecks are occurring i) in major urban areas and ii) on routes to and from our major sea ports. Investments to improve the main trunk routes in these locations would help to relieve congestion in the short term, although in the longer term other technological solutions might offer better value for money.

Q2.1 How has the demand for freight, and types of freight, changed over the last two decades, and what will be the drivers for changes in the future?

The ITC has identified significant problems in the way that freight movements currently are measured. This is making it difficult to analyse trends in detail. However, it is clear that the number of home deliveries has increased in line with the growth in online shopping and retail.

A workshop was held with the DfT and ONS in late 2015 to explore ways of improving freight data collection and analysis. The recommendations are available on request and have been passed to Satish Luhar at the NIC. We would suggest that these findings are reviewed and would encourage the NIC to support taking the recommendations forward.

Q3.3 With limited space for new infrastructure, how can we better use our exiting urban network to support freight? Are there changes – such as changes to modes, methods, or delivery times, that could help reduce the stress on urban transport network?

The ITC published a study in 2017 exploring ways of improving urban freight distribution (details given below). This found that a range of initiatives could be developed so that freight can make better use of capacity on our existing urban networks, including the retiming of deliveries and the establishment of urban consolidation centres.

Q4.1 Are there efficiencies within freight management and distribution practices that could help reduce the CO_2 and NO_x emissions from freight?

The ITC's urban distribution report (2017) found that significant improvements could be made to distribution practices that could help reduce emissions. In particular, the retiming of deliveries to off-peak hours can reduce idling times in congested traffic, and the establishment of urban consolidation centres can dramatically reduce the number of miles travelled for urban freight movements.

Q4.2 What role do alternative fuels such as electricity, Liquid Petroleum Gas and biofuels have to play? What are the barriers and challenges to wide-scale uptake of alternatives to diesel and what could be done to help remove these issues?

Alternative fuels will have a growing and essential role in reducing freight emissions in urban areas. Margins are low, however, in the distribution and logistics industries, and assistance with the costs of upgrading to electric vehicles is often required. The energy infrastructure also needs to be significantly upgraded in urban areas to provide adequate recharging locations for electric vehicles. In the short term, support for Gas-to-Liquid (GTL) fuels for freight would be advisable, since this is compatible with existing combustion engines and fuel infrastructure, yet releases significantly lower emissions than diesel fuel.

Q5.1 How will new technologies change the capacity and performance of the freight network? Over what timeframes might these new technologies begin to affect the freight transport network?

The ITC urban distribution study demonstrated that new technologies can make a significant difference to freight efficiency and enable better use of the capacity of urban transport networks. The use of autonomous vehicles, pods and robots for 'last mile' deliveries are already being trialled in the UK, although it is likely that initiatives will require regulatory support before they can scale to a level where they become commercially self-sufficient.

Q5.4 How might regulations and physical infrastructure need to adapt to new technologies and business models in the freight sector?

The ITC's research has made a number of recommendations for policy makers to help the sector adapt to new technologies and business models. In particular, support for innovative pilot schemes is important: London has benefited from local authorities willing to provide either regulatory or financial support to help develop new initiatives. In addition, some initiatives, such as urban consolidation centres, need assistance in order to scale up sufficiently to become commercially viable. Occasionally, when trialling new technologies some regulatory measures are necessary to support the initiative, prevent free riding, and justify ongoing investment.

ITC Freight Reports:

Independent Transport Commission, *Improving the Efficiency of Freight Movements: the contribution to UK economic growth* (2014). Download available from: http://www.theitc.org.uk/wp-content/uploads/2011/03/ITC-Freight-interim-report-July-14.pdf

Independent Transport Commission, *How can we improve urban freight distribution in the UK: challenges and solutions* (2017). Download available from: http://www.theitc.org.uk/wp-content/uploads/2017/05/ITC-Urban-Distribution-report-May-2017.pdf

DfT, ONS and ITC Freight data workshop report (November 2015). Available on request (a copy has been given to [Name redacted]).

Independent Transport Commission

5 March 2018

Peel Management Limited, Peel Dome, intu Trafford Centre, TraffordCity, Manchester M17 8PL
TEL: 0161 629 8200 FAX: 0161 629 8333 www.peel.co.uk

By email to: Freightstudy@nic.gsi.gov.uk

National Infrastructure Commission Freight Study Call for Evidence

Response on behalf of The Peel Group

5 March 2018

INTRODUCTION

The Peel Group

The Peel Group operates in a diverse range of sectors giving it a broad base of interest in the UK economy. We perform a variety of roles from land owner, through developer, to investor and operator of infrastructure assets and businesses. Good, modern infrastructure is key for the productivity and prosperity of our clients' and our own businesses, as well as the communities they serve and employ. Our broad range of geographic and sector coverage plus direct involvement in the transport (ports, aviation, freight), property (logistics, industrial, commercial, retail, residential), energy, and water sectors gives The Peel Group a unique perspective on both the demand and supply sides of the UK's infrastructure issues and solutions. Further information about The Peel Group is included in Annex A.

The Peel Group and the National Infrastructure Commission

The Peel Group has responded to three of the Commission's consultation stages to date:

1. Connecting Northern Cities Consultation (Autumn 2015) - letter submitted in January 2016.

2. Call for Evidence (October 2016) - letter submitted 10 February 2017, including comment on the Economic Growth and Demand for Infrastructure Services topic paper of December 2016.

3. Economic Growth and Demand for Infrastructure Services topic paper (February 2017) - letter submitted 31 March 2017.

4. Consultation on National Infrastructure Assessment report "Congestion, Capacity, Carbon: Priorities for national infrastructure", January 2018.

We have also attended several stakeholder events held by the Commission.

Businesses that The Peel Group is a shareholder of have also responded individually to various consultations and calls for evidence, including this consultation.

RESPONSE TO FREIGHT STUDY CALL FOR EVIDENCE

We welcome the addition of a specific Freight Study in the scope of the National Infrastructure Commission's work as we believe this key aspect of the economy has previously been overlooked and is lacking from the Initial National Infrastructure Assessment Report "Congestion, Capacity, Carbon: Priorities for national infrastructure" ("INIA Report").

Freight underpins the UK economy and quality of life

1. There is currently insufficient attention to the infrastructure that supports the movement of freight and provides the backbone for so many UK economic sectors from advanced manufacturing to food and retail. The provision, improvement and maintenance of such infrastructure is reflected in the costs of goods and services across the UK, and directly impacts the competitiveness of local economies and their attractiveness for inward investment. These issues have direct and indirect impacts on quality of life in all parts of the UK. They also have a key part to play in the competitiveness of the UK as a place to invest in manufacturing and service based industries that serve both the UK and overseas markets.

International Gateways

2. International gateways, i.e. ports and airports, are key assets that drive the flow of freight for imports and exports or raw materials, components and finished goods. This was recognised in "The Eddington Transport Study" completed for the UK Government in December 2006, and more recently in the "Independent International Connectivity Commission Report" prepared for Transport for the North (TfN) in February 2017. International gateways in the North of England have a key role in rebalancing the economy, bringing goods close to their end market and reducing the costs of the UK overland leg of their journey. Surface access, via road and rail, to these gateways is a key driver of the cost and reliability of freight movements within the UK. We therefore encourage the Commission to build on TfN's work. The Commission should also build on the work of the Government's current Port Connectivity Study in England being led by the independent chair Sir John Randall.

Freight is more complex than passenger transport

3. Further to our comments above about the lack of consideration for the planning and provision of freight infrastructure, the arguments about freight in the INIA Report are too simplistic, not backed up by evidence and are unhelpful. For example:

   "An argument for shifting freight from road to rail is often made on grounds of congestion and environmental benefits. Rail freight will always have its place, and some enhancements may be cost-effective, but the Commission believes the pilots of "platooning" truck convoys on motorways and major A roads may open the way to radical improvements in the efficiency and capacity of major freight distribution by road in the future (see Chapter 5). This would free up rail capacity for enhanced commuter and inter-city passenger services."

   "Reducing road freight by only one-third would require more than a three-fold increase in rail freight capacity, which simply could not be accommodated on today's already busy railway.

The Commission believes that upgrades needed for this sort of shift would be prohibitively expensive, whilst the benefits would be questionable, particularly if truck platooning is successful, given the industry's clear preference for road transport in most cases."

4. These assertions ignore the multiple facets of the freight and logistics industry from bulk movements (e.g. construction, energy and containerised goods) that support our economic growth and competitiveness to the local distribution networks (e.g. food and retail) that in turn support our quality of life. It also ignores the challenges of road capacity on the last mile to ports and major interchanges which are often on the fringe of our urban centres. It also ignores the issue of existing congestion on roads, the forecast growth in traffic and the complexity of combining platooning of freight with autonomous vehicles on the road network as promoted elsewhere in the report.

5. Cost is normally the primary driver for the freight sector where rail is considered an option (and for long distance bulk cargoes such as fuels (e.g. biomass) it may be the preferred mode) – current rail freight costs reflect inefficiencies that are often driven by rail network capacity constraints. A more rigorous analysis of current infrastructure, needs and opportunities should be carried out in the context of Brexit and growth forecasts for passengers and freight traffic, taking into account energy/climate change and air quality factors. The study should take into account private sector investments, new low carbon fuels/emissions, and transport innovation, and thereby provide a more considered opinion on the opportunities for rail freight, road use charging and autonomous vehicles/platooning.

6. While it is currently inconceivable for certain types of freight to be switched between modes, rather than ruling out options, the Commission should be looking for solutions to drive efficiencies and tackle the breadth of issues that lead to poor productivity and lack of competitiveness. We believe these should include additional rail capacity on key routes to/from our ports serving inland centres of industry and population. Modelling recently carried out for TfN shows road freight along the M6 corridor to/from the Midlands and South of England from/to the North West, growing from 86.1 million tonnes per annum in the 2016 baseline to 177.5 million tonnes per annum (a 106% increase) in 2050 under the NPIER Growth scenario (see figures 7.2 to 7.4 in the Initial Major Roads Report, Strategic Transport Plan Evidence Base, TfN, June 2017). The existing challenges on the M6 combined with the freight and logistics growth and additional cars resulting from population growth forecasts will require new solutions. Capacity on existing railway lines freed up by HS2 will need to be allocated for use by freight. Additional road and rail capacity will also need to be provided to maintain productivity for sectors dependent on freight movement north and south in these corridors, and to encourage use of the optimal mode to drive productivity, competitiveness and quality of life.

Air Freight

7. We are disappointed not to see a mention of air freight in the terms of reference or call for evidence. Air freight is less than 1% of global freight by volume but 35% by value[1]; it should not be overlooked. The value of air freight to the UK economy and to regional airports should not be

[1] http://www.iata.org/whatwedo/cargo/Pages/index.aspx

underestimated. The heavy concentration of air freight services at a few airports results in significant additional freight mileage and emissions on UK roads.

8. Changing consumer behaviour is already driving an increased need for growth in air freight traffic. Boeing's World Air Cargo Forecast in 2016-17 predicted that global air cargo demand will more than double over a 20 year forward timeline. This demand is driven by changing trends such as the growth in e-commerce and on time and temperature sensitive goods such as pharmaceuticals, perishables and consumer goods such as textiles and fashion.

9. UK cargo capacity is currently somewhat limited and expected to become even more so as runway capacity, particularly at the largest airports, is being prioritised for passenger services. This will restrict availability of slots for pure cargo traffic which will in turn have a knock-on effect on service levels. With fewer slots available for cargo, it is possible that goods will end up being flown into/out of other intercontinental hub airports, potentially in mainland Europe, and trucked into/within the UK. The UK therefore loses the economic benefit of handling the air freight, and UK businesses and consumers bear the additional costs for the extended handling and journey. There are already examples of freighter traffic being forced out of major airports, such as recently with Amsterdam Schiphol: https://theloadstar.co.uk/first-direct-threat-jobs-schiphol-cargo-flight-slot-cuts-begin-bite/. The potential Brexit scenarios add further complications.

10. Research to ascertain the true origin and destination of air freight in the UK, forecast its potential growth, and therefore to understand how to best utilise the UK's airport and surface transport assets, is needed. This would provide valuable insight for the Government's Aviation Strategy which is under development.

Freight is multi-faceted

11. The economic performance of the freight sector is not just driven by transport matters; it relies on land, real estate, skills, energy, professional services and other business factors.

12. For example, the challenges for freight in the urban areas, as recognised in the call for evidence, go beyond transport and congestion into the supply of land and skills. The requirements of modern, efficient logistics facilities have outgrown historical urban sites. However, the UK's large metropolitan centres are tightly bound by green belt so the requirements for new, large logistics or manufacturing facilities in a sustainable location close their consumer and/or labour market, as well as wider transport links, cannot easily be met. Two reports that provide a good insight to these matters are:

    a. Liverpool City Region SuperPort Market Analysis Land and Property, NAI Global, March 2014[2]

[2] https://www.liverpoollep.org/wp-content/uploads/2015/06/LCR-superport-market-analysis-03.2014.pdf

b. Haydock Point Economic Statement, Turley, March 2017[3] which includes:

   i. Logistics Market Review and Advisory Paper, Total Logistics, January 2016,

   ii. Haydock Point Land Report, CBRE, January 2017, and

   iii. Draft Local Employment Strategy, March 2017.

Regional and Local Strategies and Evidence

13. The Peel Group and its investee companies have positively engaged with public and private sector on the development of Transport Plans, and Freight and Logistics strategies, and related studies and initiatives to ensure the boarder interests and facets of freight and logistics sector are represented. We would encourage the NIC team to review the following initiatives and documents in conducting its Freight study:

    a. SuperPort Liverpool, Liverpool City Region Local Enterprise Partnership[4]

    b. Liverpool City Region Freight and Logistics Strategy, the Combined Authority, supported by Merseytravel and the Local Enterprise Partnership is in the process of finalising a new strategy, and

    c. Transport for the North has commissioned two reports [5 and 6] that highlight issues and opportunities to grow the contribution from freight to the northern economy.

UK Freight Strategy

14. The significance of freight for the UK economy and breadth and complexity of issues means it warrants the development of a UK Freight Strategy covering transport (road, rail, water, air), land and people that can inform other UK strategies and policies, such as the National Planning Policy Framework, National Policy Statements, skills and education, and investment programmes.

Innovation vs Strategic Investment

15. The INIA report places a lot of weight on emerging technologies such as platooning and autonomous vehicles that have yet to be commercially proven, or whose effects are unclear, while others such as rail freight and hydrogen that could each have a significant impact on policy areas

[3] http://publicaccess.sthelens.gov.uk/online-applications/files/4C0B09EB911853625B03F1F2B39A004A/pdf/P_2017_0254_OUP-ECONOMIC_STATEMENT-951172.pdf

[4] http://www.superport.co.uk/

[5] https://transportforthenorth.com/wp-content/uploads/TfN-Freight-and-Logistics-Report.pdf

[6] https://transportforthenorth.com/wp-content/uploads/Freight-and-Logistics-Enhanced-Analysis-Report.pdf

such as road congestion, air quality, energy security of supply and decarbonisation are not given equivalent attention or supporting evidence.

16. For example, the commercial impact of platooning is uncertain. The vehicles will have to stop at a common meeting place to form the platoon; the platoon will also need places to stop (including for driver welfare provision) and split up. Each vehicle in a platoon will need a driver to complete the first and last legs of the journey, and either accompany the vehicle or have the means of completing the return journey to work or home. There is therefore little or no saving on the manpower costs unless travelling significant distances. The concept of trucks vehicles driving to a common point before travelling long distances is no different from rail freight interchanges. However, the proven alternative of rail provides savings on fuel, assets and manpower if the utilisation of assets and efficiencies can be achieved. For platoons to integrate safely with other traffic, it is recognised that the use of road capacity will have to change, including potentially giving over a lane to platoons. The challenge of providing additional capacity on key trunk roads is already well understood from the work on SMART motorways and Government sponsored road studies, such as the Greater Manchester M60 North West Quadrant and Trans Pennine Tunnel Strategic Studies, each of which advocate spending £5-10 billion to resolve their specific issue. In addition, decarbonisation of the railways does not rely on innovation in HGV propulsion technology, just Government investment. A serious review of previously closed railway lines on key road freight routes should be undertaken to identify opportunities to provide additional rail capacity and improve efficiencies, and thereby attract private sector investment in rail freight. Recent examples include the Skipton-Colne line that is the subject of a Government sponsored study[7], and the Woodhead railway that is being promoted to ease congestion across the Peak District[8]. A more strategic approach is clearly warranted and we believe the NIC is best placed to conduct a proper evaluation of the options and propose solutions to the Government that take all issues and policy considerations, including development of new technologies and the UK's Industrial Strategy, into account.

[7] https://www.gov.uk/government/news/new-study-into-revival-of-skipton-to-colne-rail-link

[8] http://www.grandnorthern.co.uk/

RESPONSE TO CALL FOR EVIDENCE QUESTIONS

1. *What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?*

    a. congestion – freight is a low margin business; the anticipated costs of congestion issues are passed on to the consumer wherever possible; however, journey time reliability is one of the key asks of the freight sector to enable them to deliver consistent customer service, manage margins and allow for efficient planning and utilisation of staff and assets, thereby making them more productive and competitive, and providing better pay and job security.

    b. lack of road and rail capacity to/from key international gateways

        i. invest in new capacity, e.g. Port of Liverpool access scheme (RIS1)

        ii. target congestion from other road users that can more easily be encouraged to use other modes such as local rail and buses.

    c. lack of rail capacity / efficient routes for rail freight, leading to lower utilisation of rail assets and higher costs than alternatives, making road based alternatives the default mode

        i. invest in unlocking bottlenecks on rail network, e.g. crossing of main lines,

        ii. increase gauge clearance on constrained routes,

        iii. invest in more advanced signalling/train controls and passing loops to increase capacity and utilisation of railways,

        iv. reopen disused/closed rail lines, e.g. Skipton-Colne and Woodhead lines.

    d. cost and time to obtain new connections to railway lines at new freight sites

        i. inclusion/prioritisation of economic growth opportunities in Network Rail's Control Period programme, and/or

        ii. grant funding to overcome viability/funding challenges for new rail freight facilities, e.g. Port Salford, Liverpool2 rail terminal.

    e. land availability in key strategic locations - efficiencies in freight, and optimisation of supply chains, relies on land, skills and transport links being available in the right place, e.g. port-centric, multi-/inter-modal

        i. introduce spatial planning as part of local Industrial Strategies and Economic Strategies to ensure local, regional and national need for land to support efficient, modern manufacturing, freight and logistics operations is included in local spatial plans.

2. *How might the demand for freight develop and change over the next 20-30 years?*

    a. growth is set to continue in line with local opportunities and aspirations, so long as there is sufficient investment in public infrastructure.

    b. Northern Powerhouse, Liverpool2, Brexit plus skills availability, costs and congestion in the South of England, gives the North the opportunity to grow faster than the South in the coming decades.

3. *What effects does congestion have on the efficiency of freight movement and emissions?*

    a. Please actively engage the various large haulage organisations and industry bodies in the Freight Study; they will point the NIC to relevant evidence.

    b. Many hauliers are small companies with self-employed drivers who own/operate second hand vehicles and are paid by the delivery. Loss of time and increased fuel consumption in congestion has a major impact on their earnings potential and standard of living. This has already had a major impact on the availability of drivers in high employment areas of the country where more attractive employment is available. The cost of moving to lower emission vehicles will have major impact on these individuals and the freight industry.

4. *How can freight lower its carbon and air quality impacts?*

    a. Minimising emissions on both the domestic leg and end to end journey by shipping international freight to/from the closest port, as envisaged by Peel Ports' Cargo 200 initiative, will have a major impact on UK freight costs and emissions. This requires international shipping companies to commit to provide services from these ports.

    b. Electric or hydrogen powered railways provide a low carbon/low emission solution to current and future challenges and can support sustainable growth in some parts of the freight sector.

    c. Inland waterways, such as the Manchester Ship Canal, already provide efficient low carbon/low emission alternatives when compared to road based transport. In time the conversion of canal shipping to hydrogen may be possible.

    d. While freight is predominantly private sector-led (as with the energy sector), the Government has a major role to play in facilitating and supporting the development and deployment of lower carbon/lower emission alternatives, just as it did in the energy sector. Devolving the air quality (and low carbon) issue in respect of freight to local authorities is likely to impact an industry that works across authority boundaries; it also has the potential to disrupt the level playing field and make the UK less competitive than other countries for foreign direct investment. Strict regulation at a local or national level without commensurate fiscal support will have a major impact on the many small businesses and low earners in the sector, which will have a knock-on effect to all parts of economy.

5. *How could new technologies be utilised to increase the efficiency and productivity of UK freight?*

   no comment

6. *Are there good examples internationally of freight systems, policy, infrastructure or technology development and implementation that the UK can learn from to increase freight efficiency and/or reduce the carbon and congestion impacts?*

   no comment

Annex A

The Peel Group

The Peel Group has a deep commitment to sustainable economic growth, built on an ethos of recycling capital and delivering long-term investment, both in our home in the North of England and through our regeneration projects across the country.

Over the last four decades, we have led over £5 billion of investment in housing, transport and logistics infrastructure, energy supplies, and the development of new industrial clusters across the UK. Our successful record of partnership working with public and private institutions has generated over 70,000 new jobs and created £27 billion of GVA for the UK's economy.

We invest for the long term in projects that spearhead local redevelopment, and drive much wider growth. At MediaCityUK in Salford, we delivered our £650 million investment in Europe's largest private sector construction project through the last recession. Our recent £400 million investment in the Port of Liverpool will allow the world's largest vessels to call in the North of England, opening up new export markets for the region, and new overseas trade routes for the whole of the UK.

We reinvest our profits back into our businesses and communities, broadening our impact and creating long-term relationships that deliver for local areas across the North and the rest of the UK.

Peel Group's business interests cover a range of sectors with specific interest in this consultation, with investments covering advanced manufacturing, international, national and local connectivity, energy, infrastructure, digital and creative, tourism and real estate, including:

- **Airports:** Peel is driving investment in international gateways across the regions of the North of England – particularly Liverpool John Lennon, Doncaster Sheffield and Durham Tees Valley Airports, where in total we have invested more than £300 million in expanding capacity and building new infrastructure – airports not only transport people and freight as part of national and international trade but are also catalysts for local and regional economic growth. These airports, in addition to Peel's City Airport and Heliport in Salford, also provide significant facilities for the general and business aviation sector.

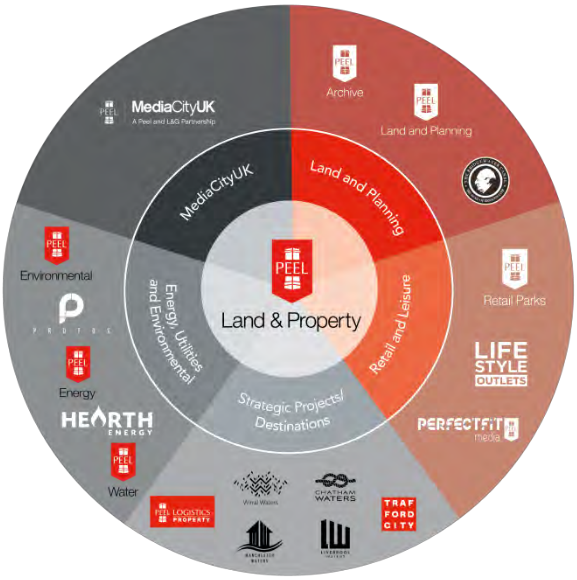
- **Ports:** Peel Ports Group is one of the largest port groups in the UK, handling over 70 million tonnes of cargo (15% of the UK's total port traffic) through international gateways including the Port of Liverpool, the Manchester Ship Canal, Heysham Port, Great Yarmouth, Medway Ports and Clydeport's Scottish Ports – playing an ever more critical role as the UK seeks to become an even better connected global trading nation.

- **Logistics:** the Peel Group's strategic approach to logistics is to combine the strength of our land holdings and transport investments to deliver a potential 60 million sq ft (5.5 million sq m) of new build logistics space across the UK, in partnership with Macquarie Capital – the logistics sector is not only a major employer in its own right, it provides key capabilities for imports and exports and supports productivity and service improvements for manufacturers, wholesalers and retailers.

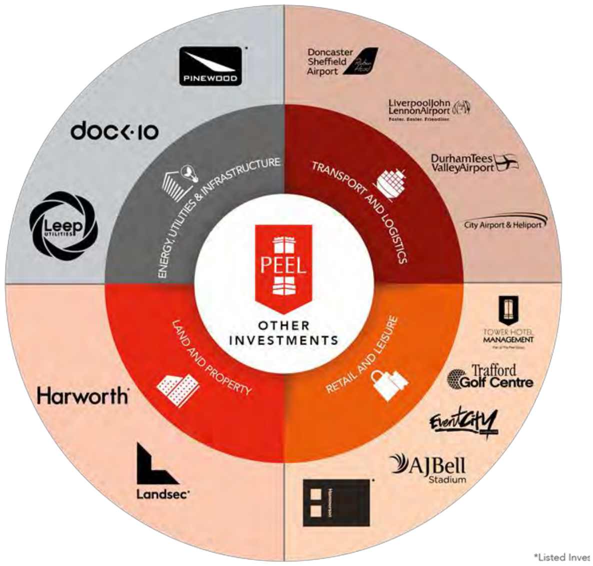
- **Land & Property:** placemaking, including through a series of large strategic destination projects, The Peel Group invests in regeneration and the revitalisation of communities across the UK. Key schemes include MediaCityUK, Liverpool Waters, Wirral Waters, Trafford Waters, Manchester Waters, Chatham Waters, Gloucester Quays and Glasgow Harbour. We are delivering a pipeline of 105,000 new homes, through regeneration projects and sustainable urban extensions in communities across the UK that will help people (and their families) gain access to the housing.

- **Energy:** the Peel Group's energy and utility interests are driven by the delivery of a diverse energy portfolio. Peel Energy, Peel Environmental, Peel Utilities and Peel Gas & Oil work together to ensure that energy is sourced, delivered and utilized as efficiently as possible via low carbon, environmental technologies, gas and oil, local generation and distribution.

Peel Land and Property Group



Other Peel Group Investments



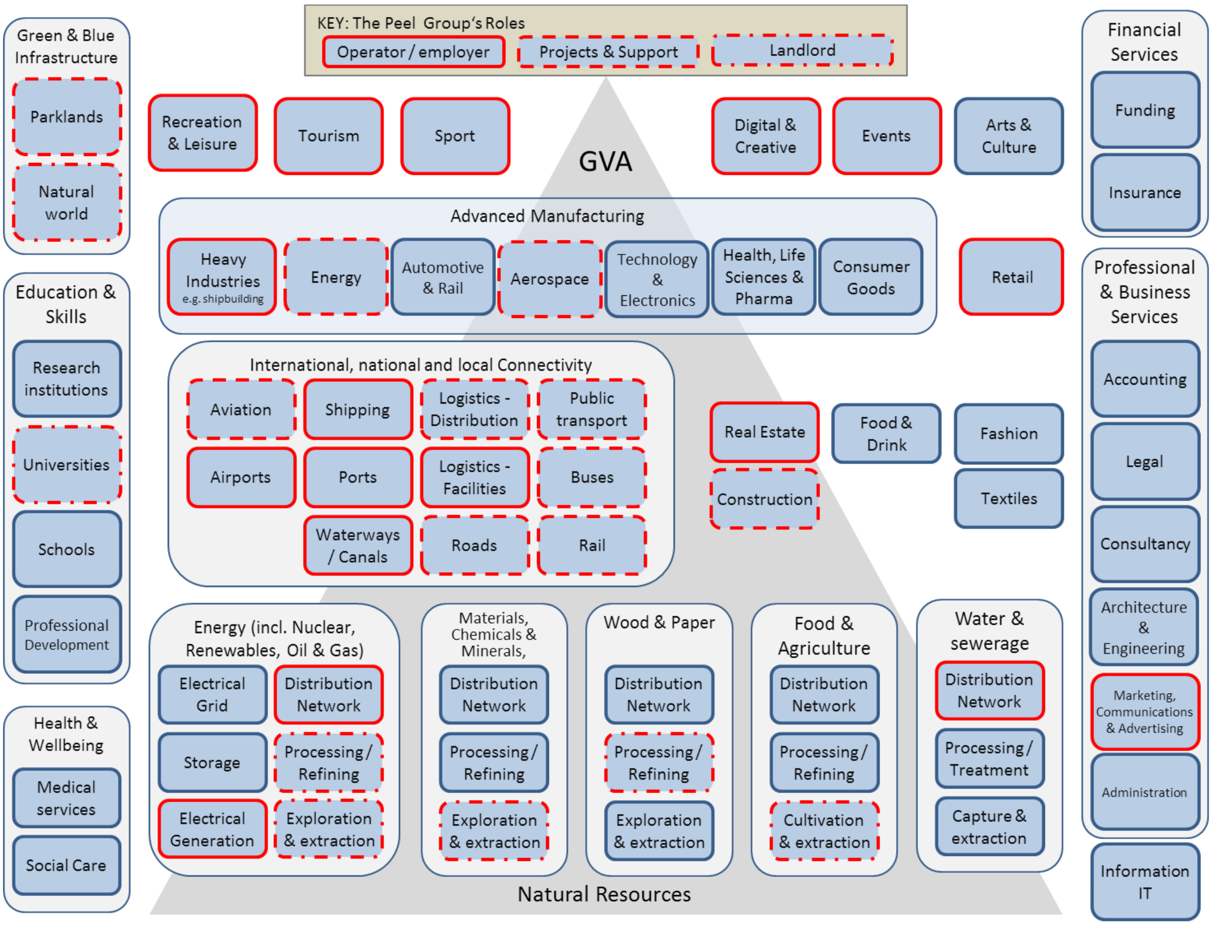
We have a track record of delivering ambitious visions with recent examples including the transformation of RAF Finningley to Doncaster Sheffield Airport, Salford Docks to become MediaCityUK and a 50MW wind farm on unproductive land at Frodsham. We also carry out major research to promote infrastructure including the recent Mersey Tidal Power feasibility study and the Ayrshire Power station planning application which was shortlisted in the Government's first Carbon Capture and Storage competition.

We are a private sector organisation with many public sector partnerships. Our investments are often highly dependent on national and local policies and related public infrastructure. We have a unique perspective on the relationship between the economy, productivity, place-making, communities and investment in infrastructure.

While based in the North of England, we have business interests across the UK from the Shetland Isles to Kent, Cornwall to Norfolk. Our pipeline of infrastructure, transport, property, housing and energy projects, and our place-based industrial regeneration projects – £53 billion of total potential investment – exemplifies our commitment to growth in regions that have the potential for growth and productivity improvement. We are building new hubs for trade and logistics, supporting the delivery of more than 250,000 new jobs. The vision behind our integrated regeneration projects underpins our belief in the long-term benefits of partnership and joined-up investment.

This is why we are a founding partner of the Northern Powerhouse Business Partnership, and why we support the vision for a national Industrial Strategy and a Northern Powerhouse strategy that tackles historical imbalances in investment, unlocks local strengths and supports high-growth industries in all regions of the UK.

The Peel Group operates in a diverse range of sectors giving it a broad base of interest in the UK economy. We also perform a variety of roles from land owner, through developer, to investor and operator of infrastructure assets and businesses. The sectors which our business interests cover are represented in the diagram below:



Good international and domestic connectivity and infrastructure services are key for the productivity and prosperity of our clients' and our own businesses, as well as the communities they serve and employ.

Our businesses that operate in the real estate, freight and logistics, energy and housing sectors bring a wealth of experience that assist the operational ports and airports in developing and delivering synergies and opportunities for innovation to create a strong sense of place and build diverse communities that can sustain clusters of activity in and around key international gateways.

Our broad range of geographic and sector coverage gives The Peel Group unique perspectives on both the demand and supply sides of the UK's infrastructure sectors.

Response from [Name redacted], [Job title redacted], Future City Logistics.

The National Infrastructure Commission call for evidence will, I am sure, elicit responses from the great and the good (and perhaps, mot so good!), including Trade Associations, membership organisations and special interest groups. The one thing they (should) all agree on, is there is no single solution to improving the efficiency and reducing the impact of freight activity.

This response is from Future City Logistics, an independent consultancy, focused on increasing the sustainable movement of goods and services in urban areas. As such, the answers given are focused on freight into and around urban areas.

The response based on practical experience and is modally 'agnostic' and does not seek to value one solution over another. However, based on long personal experience of working in the logistics industry and within the public sector at a regional level, the key issue is to understand the global commodity flows that are moving around this country and how this interacts with land use; from ports and distribution centres to offices, hospitals and homes.

QUESTIONS

The questions the Commission is particularly keen to focus on in this initial phase of work are as follows. You may wish to respond to all or any of the below:

1. What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?

Freight is the transport result of the purchase and supply of goods and services. There are two key constraints:

- Lack of central and local government understanding of logistics - i.e. what drives the demand for freight traffic - and how to manage the freight that results.
- Lack of understanding of the critical link between transport and land use policy, to enable economically effective and efficient urban freight. This is most obviously exposed between the Departments of Transport and Housing, Communities and Local Government, who seem incapable of providing any coherent joint direction to local authorities to tackle congestion, air quality, and safety and security.

1.1. What do you see as the key drivers to a successful freight system that is fit for the future?

The advent of smartphones, CAVs etc, lead some to believe that technology is the solution, especially for vehicles. But the issue for future freight systems is about understanding the movement of commodities (i.e. logistics) and not the vehicles; the commodity flow for bread (from growing the wheat, to the factory, to the sandwich shop) are completely different to the flow for concrete (the quarrying of aggregates, moved to the construction site and potentially to landfill 50 years later).

This requires re-evaluating the economics of logistics, both as a land use and the likely impact on the resulting freight movements. This needs to drive a re-prioritisation of the movement of different types of goods (whatever vehicle they are in) alongside passenger movements. This would ensure that any future infrastructure development considered both passengers and goods movement simultaneously.

1.2. Which are the key freight corridors that matter the most? Where are the bottlenecks in the freight network, and what investments in upgrades could deliver the best value for money for freight efficiency and UK plc?

Brexit may alter international freight flows, but this is unlikely to be significant to the direction of trade, unless the economic interests of the country are put secondary to politics.

45% of UK trade is with the EU, so movements of goods from the EU and further afield through EU ports (particularly Rotterdam and Antwerp) are crucial, making the route from Dover and Folkstone to London and onwards a primary focus. The imports of goods through Felixstowe and Southampton, and through smaller ports has to come a close second.

Ideally these movements would be via rail rather than road, and straight to locations close to the consumer, rather than a series of NDCs, RDCs and local hubs. This is unlikely in the short-term, but land and transport planning needs to start to address the supply and demand locations, rather than be based purely on land value.

1.3. To what extent are the economic benefits of freight factored into wider transport infrastructure investment planning?

In my experience they are not.

1.4. What are the regulatory and legal issues that, if changed, could improve freight efficiency without increasing costs or reducing efficiency?

There is a huge complexity of regulations that might impact any individual element of the delivery process of goods between supplier and customer. The majority of these have been introduced to solve single issues, some at a local level and some nationally. The resulting complexity breeds a fear of challenging the status-quo from operators, customers and local authorities.

I take one example from the urban delivery perspective: Transport for London recently completed work on encouraging the retiming of deliveries. An early piece of research identified a range of curfew restrictions that could apply to a single premise:

- Planning Conditions
- Environmental Health Orders
- Vehicle Access & Routing Restrictions & By-laws
- Road Infrastructure/Loading and Unloading Restrictions (signs and lines)
- Health & Safety Restrictions (e.g. for beer and COSHH deliveries)
- Control of Alcohol Licensing

- Anti-Social Behaviour Orders
- Operator Licensing Conditions
- Other Statutory Restrictions - Congestion Charging and Others
- Non-Statutory Restrictions - Tenancy Conditions and Voluntary Agreements

There is no earthly way a freight operator can guess what rule applies without detailed discussions with the recipient, ensuring the default solution of daytime delivery currently applies in most instances.

This needs a mindset change by both central and local government to start to provide regulations that facilitate a range of different delivery practices and consider amending or review of a range of others. For example, challenging the blanket application of planning restrictions on overnight delivery, rather than conditions to facilitate overnight delivery.

The other major barrier I would highlight is the artificial regulatory limit of 3.5t (even potentially 4.5t for EVs). Vehicles below 3.5t are commercial vehicles, so why are they governed so differently from HGVs?

2. How might the demand for freight develop and change over the next 20-30 years?

Put simply, smaller consignments and more instant gratification seem to be the direction we are heading in. Banning free delivery would be a good (if Stalinist) way forward, but suggesting there is a magical way to put this genie back in the bottle is fanciful. Supply chains are increasingly global and seem to be coming less sustainable by the day. For example, it will be interesting to see what happens with the current 'plastic panic' and if we end up importing more paper and cardboard to cope, but I would suggest supply chains can never be truly sustainable – soft fruit from the southern hemisphere available in a British winter anyone?

There also appears to be a growing interest from suppliers to bypass intermediaries (the supermarkets) and deliver direct to the consumer. This may be great for the consumer - e.g. an Amazon Prime drone delivery - but the number of separate deliveries created if Kellogg's, Unilever, Mueller etc all attempted to deliver groceries to every home might become unbearable.

2.1. How has the demand for freight, and types of freight, changed over the last two decades, and what will be the drivers for changes in the future?

Again, put simply, consumer gratification, wider choice and smaller consignments, and growth of (unregulated) vans.

2.2. How is the freight industry planning for future changes in the demand? What levers might be available to shape future demand for freight transport?

The freight industry is squeezed from every direction and, apart from a very few big companies trying to second-guess their customers, it is not. Those that are, are planning for changes in future customer behaviour (frequently driven by the retailer).

The few examples where freight planning is being done in the UK is driven by external factors: e.g. city policy (Clean Air zones) or city input (TfL's construction logistics programme). There are also some international programmes in Asia and the USA, mainly based on air quality or national economic activity (China's 'new' silk road rail). There are also EU programmes on international networks. However, I would stress this is not the industry planning, but others on their behalf.

3. What effects does congestion have on the efficiency of freight movement and emissions?

Congestion reduces freight efficiency and increases emissions.

3.1. How does congestion impact upon the productivity and economic contribution of freight? To what extent does congestion affect changes to mode, time or other freight choices?

Ask any operator their productivity level in London compared to the Midlands. Despite greater density of drops in London their productivity is lower. However, the freight industry response will always be to deliver what their customers have paid them to do, and use more vehicles to deliver the same volume. This was clearly seen in London with the introduction of the cycle-superhighways leading to greater congestion and more freight vehicles.

3.2. How does congestion affect the environmental impacts of the movement of freight?

In an urban setting, congestion will reduce air quality and (bizarrely) can increase safety, as vehicles are travelling slower. It also makes it more noticeable, creating visual intrusion and increasing the separation caused by major roads to residential areas. It does not particularly change the noise levels, which are less vehicle and more delivery/collection based.

3.3. With limited space for new infrastructure, how can we better use our existing urban network to support freight? Are there changes – such as changes to modes, methods, or delivery times - that could help reduce the stress on the urban transport network?

To be blunt this is how I make my living(!) I'm happy to contribute more, but simply put there is a hierarchy:

- Minimise the number of road freight trips (modal shift, land use planning and consolidation through procurement),
- match the demand to the network, route and location, and
- mitigate the trips with safer vehicles and drivers, cleaner and quieter vehicles and equipment.

The higher up the hierarchy you go, the lower the 'stress on urban transport networks'

4. How can freight lower its carbon and air quality impacts?

See above answer to 3.3 above.

4.1. Are there efficiencies within freight management and distribution practices that could help reduce the CO2 and NOx emissions from freight?

Consolidation through procurement, an allocated (and timed) delivery location for all premises and road user charging for ALL road users on a distance and time basis.

4.2. What role do alternative fuels such as electricity, Liquid Petroleum Gas and biofuels have to play? What are the barriers and challenges to wide-scale uptake of alternatives to diesel and what could be done to help remove these issues?

They have a role but confusion reigns. For example: Paris plans to be diesel free by 2025 and London is focused on the introduction of the ULEZ. So, in Paris there is an increased use of gas HGVs, while in London, as gas is not zero-tailpipe, gas is not being considered. It is not really any surprise the industry hasn't a clue.

Greater investment in high-quality research such as the Centre for Sustainable Road Freight of the LoCITY programme could assist to reduce this confusion.

4.3. What technologies could best and most realistically be utilised to manage the carbon impacts of freight, both within urban areas and on longer strategic journeys?

This is not my area of expertise, but rather than looking at the responses from 'interested' parties (OEMs or the Rail Freight Group), I would suggest you discuss the responses you receive with two organisations focused on decarbonisation of road freight. In the UK the ESPRC funded Centre for Sustainable Road Freight, and internationally, Smart Freight Centre, in the Netherlands.

My only other comment would be, beware of relying too much on technology, the customer for freight is human, and makes the purchasing decision in the first place. People who can afford a private delivery will always pay for it – no matter the carbon or air quality impact.

5. How could new technologies be utilised to increase the efficiency and productivity of UK freight?

Any reliance on technology could have huge unintended consequences. However, a long-term solution for freight vehicles must be to have GIS technology used to manage the right driver, in the right vehicle, at the right time in the right place, especially for security reasons. The CLOCS programme has already developed smartcards for drivers to ensure training and licenses are up to date.

5.1. How will new technologies change the capacity and performance of the freight transport network? Over what timeframes might these new technologies begin to affect the freight transport network?

Through consolidation and 'control-tower' activity they may do. But this relies on moving away from individual supply chains, which might be acceptable in the case of domestic or commercial waste, but is unlikely to suit retailers. It is also unlikely to suit the individual customer, if they cannot get what they are prepared to pay for.

5.2. How can the use of data such as real-time traffic information by artificial intelligence and machine learning systems help to improve freight efficiency and productivity? How might this affect the business models and requirements of freight in the future? Are there any barriers to the greater use of data in freight?

This is not an area of expertise. But from experience at the ‘small data’ end of projects, I would suggest that commercial confidentially and the commercialisation of data by the bigger companies (and nowadays, the big tech companies) is a major barrier.

5.3. How do you see technologies such as HGV platooning, digital railway signalling, and autonomous vehicles being integrated into freight distribution?

We know the technology works. If we can agree how to move from stage 3 CAVs to stage 5 overnight that would help. However, where some vehicles are CAV and some aren’t, the acceptability to individuals (for example, those with a disability) may be problematic.

5.4. How might regulations and physical infrastructure need to adapt to new technologies and business models in the freight sector?

As mentioned above, a long-term solution for freight vehicles must be to have GIS technology used to manage the right driver, in the right vehicle, at the right time in the right place. However, that might require local and national regulations to recognise what ‘right’ is in every individual location and street. Unfortunately, I fail to see how our regulatory process can keep up with the technology.

6. Are there good examples internationally of freight systems, policy, infrastructure or technology development and implementation that the UK can learn from to increase freight efficiency and/or reduce the carbon and congestion impacts?

At the urban level there are a growing number of cities that have begun to manage freight flows to reduce the negative impacts. However, there is no one place to share this information – and policy makers have to know the name of the European project or the contacts in a particular city to learn what works and what doesn’t.

I believe there is a potential role for the UK to become a world leader in the sharing of information which, while others may try to commercialise it, is actually for the benefits of the economy and the planet.

National Infrastructure Commission – Freight Study – Call for Evidence

Summary:
To see a significant short-term reduction in Co2 emissions we need to rebalance freight transport across the country. This can be achieved in many ways with the two most prominent actions that can be taken relatively easily being
a) Move goods closer to their markets whilst they are still on board the carrying vessel, the reverse being the ships end closer to the manufacturers who export.
b) Rebalance the road to rail mix. The statistics showing approx. 10pct of freight tonne kilometres were by rail vs road is a very important figure that is demanding to be addressed.
Longer term, technology and new fuel types will play a major part in continuing to reduce our CO2 emissions whilst underpinning the savings already achieved. As part of the work we need to consider whether journeys can be avoided? now and in the future (empty running). Can the journey be shifted to alternative more efficient modes of transport such as Sea, Rail, Inland waterway supplemented by work to identify and drive improvement in the efficiency of all types of vehicles, road and rail, together with new fuel technologies.

1: What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?
Many responses to this call for evidence will focus on corridors for freight, each of these being focussed around the business needs of the respondent. The opportunity presented to NIC is a significant one allowing it to form an opinion on a joined-up investment strategy delivering real change long into the future. Until recently investment has been limited. We still have, in large parts, a rail network that was designed and built in Victorian times matched with a motorway network built up since the 60's. Both are struggling to handle significantly more traffic than they were designed to do. We also have a very large number of ports all competing for investment to drive their local business interests. NIC must look beyond this and consider the needs of the nation as a whole.
Shipping should be encouraged to deliver goods closer to markets. Many of the deliveries leaving cross channel ferries/trains in the South East of the Country then drive the length of the UK to deliver their goods to Scotland or the North of England. This is very damaging, not just to the roads they travel on but also to the air quality along the route. The congestion created inbound and outbound along the route, specifically on the run to Dover is considerable and costly.
We should re-balance road and rail. A single train can displace numerous trucks off our roads. The argument is generally that the train must eventually unload to a truck for the final delivery, that is true, however, given the right infrastructure plan a train can deliver goods to hub locations close to the end destination, reducing the miles travelled by the final delivery vehicle whilst opening the opportunity for that delivery vehicle to be electric powered.
Planning initiatives can encourage more development of manufacturing/logistics hubs around our major urban areas that are rail connected, allowing for goods to move directly to, or at least close to, the consumer. Rail connected manufacturing hubs can also make use of empty return trains to deliver their goods to ports or other hubs for final export or distribution.
Velocity is also important. A vehicle or train moving at optimal speed is more efficient and less polluting than a vehicle/train stop starting or crawling at a sub optimal speed. The heavy

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trains we operate are tested and passed as suitable to run at 60mph when loaded and 75mph when empty. Intermodal trains can operate at higher speeds than this. The average speed for a freight train on the system is less than 30mph. If this could be changed then the railway becomes more cost effective, productive and potentially self-financing as more track access charges are collected. From trials we have carried out one of our trains running the length of the route from one of our ports to destination at design speed will create space on the existing network, without the need for significant investments, simply by clearing sections of the route more quickly, obvious really.

The project must consider connections between our ports allowing for goods imported from overseas to make their way to their markets, even if those markets are in other countries with the UK acting as a land bridge. This demands North/South as well as East/West freight routes, if the right infrastructure is developed these routes can be a shared resource with passenger.

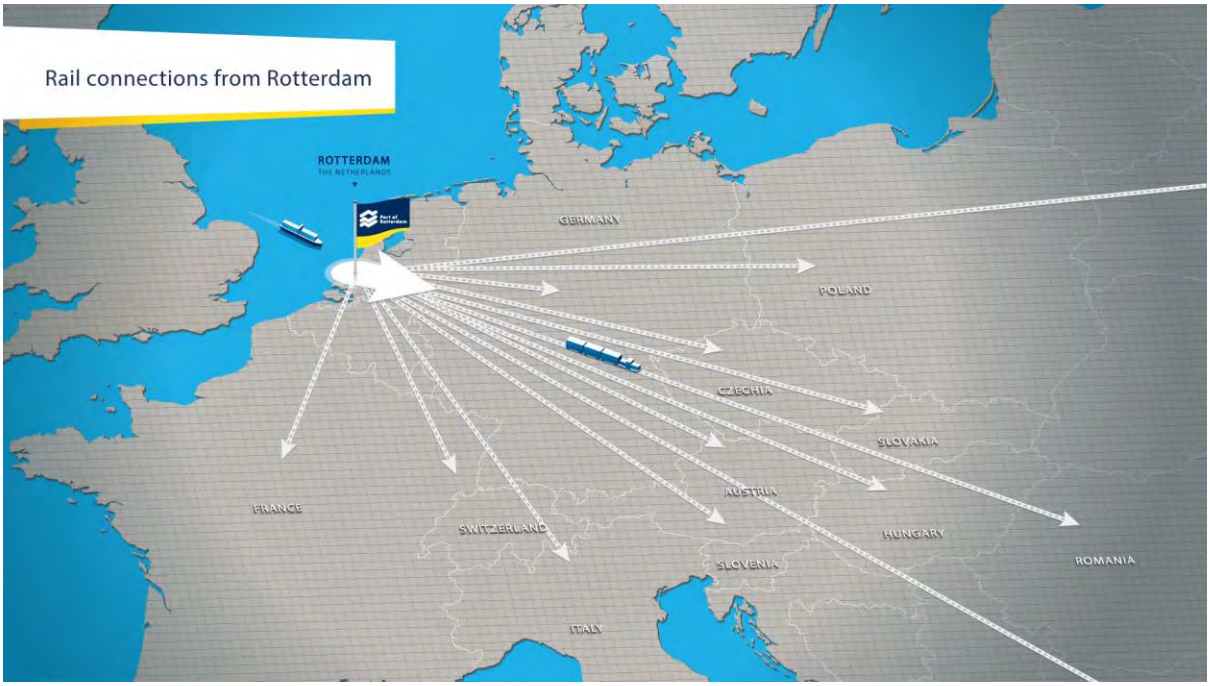
Re-balancing freight between road and rail is, in our opinion, a key driver to a successful system that is fit for the future. Given the right infrastructure manufacturers have a choice to redesign their supply chains to a more efficient cost-effective method. Today the choice is generally seen as road only.

In achieving a balance between these two modes of transport we also must consider the charging structure. Rail is charged on an as used basis whereas a truck is charged on an annual basis.

A truck can leave a depot any time of the day or night and travel along the roads freely with no regard for the cost of the damage it may do to the road network nor the congestion it may cause. It certainly seems to have no regard for the accidents it is responsible for on UK roads. Statistics suggest HGV's are involved in numerous accidents on UK roads every day and are involved in a high number of road fatalities every year.

Rail on the other hand can only leave a depot at a pre-arranged time and must run to a plan or face charges for delay to other users. Each time the train leaves a depot it is charged for the journey, this to cover the costs of damage to the network as well as the cost of using the network. Rail does not tend to cause fatalities on the network either. This in-balance in charging needs to be addressed to better reflect the true cost of freight whilst also offering Treasury the opportunity to raise funds to finance developments.

We also need a regulator who regulates for the benefit of the UK to drive air quality improvements and efficient transport choices. Currently the ORR are consulting on the next charging period. In their consultation document they suggest a party who invests in rail, and is therefore less likely to modal shift to road, should pay an additional freight specific charge for their traffic to use the railway. This sort of charging mentality does nothing to stimulate modal shift from road to rail. The growth in road tonne kilometre figures demonstrated in your data suggest continued growth of road traffic in the volumes seen in the period is unsustainable and demands modal shift to rail or waterways.



This picture shows the growth of rail freight from Rotterdam port. Traditionally much of this traffic would have been moved on the waterways or road, however continued investment in rail has seen a considerable shift in traffic to this mode of transport and stretching as far as the Black Sea and even China now.

2: How might the demand for freight develop and change over the next 20 – 30 years?
Considering the last 20 years, much has changed. Changes in shipping methods from general cargo to intermodal has influenced the way goods are imported and packaged for transport. Containerisation opened the door to rail movement of goods from the ports to customers and vice versa, however, the take up has not been as much as it could be. Many consider the combined limitations of railway infrastructure, the cost of rail with the associated final road movement and the slow average speed of freight trains to be an obstacle, preferring instead to put their containers on a truck. The large users of rail freight such as power generators and steel mills have mostly gone, resulting in a reduction in overall rail freight volumes, whilst the limitations mentioned continue to drive increasing volumes of freight onto our roads. This is evidenced by your statistics.

Some of the bigger more mature operators are considering how to move goods in the future, platooning, electric vehicles etc etc are all open for consideration. Others are moving more of their goods to smaller delivery type vehicles, this is perhaps driven by the need to get to a customer's front door by a set time or it may be for a more sinister reason. Small vans are not subject to the driving hours regulations, pressing drivers to get further quicker by not stopping for rest breaks, they are also not subject to the same speed restrictions as an HGV. This may be the outcome of our heavily congested roads, an HGV driver perhaps only completing a single delivery drop in a day with no certainty of getting back to his depot at the end of the day.

I would change the question above slightly and ask, "How **can** the demand for freight develop and change over the next 20 - 30 years".

The answer to that question should be the outcome of your work.

- Invest in rail freight infrastructure and some canal infrastructure, much of this exists, it simply needs to be upgraded.
- Re-Balance the road to rail mix of freight movements by levelling the field for charging each mode of transport.
- Link the rail to existing and new manufacturing or logistics hubs from where the goods can make their final journey by electric vehicle or similar. This solution will not

work for all, it will however reduce road movements and improve air quality. It will also, if done correctly, be able to absorb some of the growth in freight movements predicted in various studies.

The answer therefore is in your hands, develop the right infrastructure plan which includes housing, public transport, manufacturing and logistics hubs. Connect these to good freight rail and road facilities and the market will follow, always provided we get the charging structure right too. If we don't get the charging structure right, then the plan should be to build roads and lots of them.

3: What effect does congestion have on the efficiency of freight movement and emissions?
As mentioned already, it is not unusual to find a truck on a delivery run across the country is only able to make a single delivery in a day. In some cases, if the route is heavily congested or delayed due to an accident then it is very possible the driver will be unable to return to the depot at the end of day, incurring costs and potentially knocking on to the following days deliveries. The impact on productivity in the UK is enormous, I don't have a measure, however, put simply a truck delivering say 25 tonnes of goods in a single 24-hour period is not a productive day, simply transiting the M62 at times can use drivers entire operating hours for the day. The true cost of this to UK Plc is not insignificant.
I will not comment on the environmental impacts other than to say many vehicles standing or moving slowly in traffic will not create the most efficient operating conditions. In turn this potentially influences the environment in that locality. The same could be said for trains idling in passing loops waiting their slot to proceed following a passenger train.
To re-iterate earlier points on the re-balancing of rail and road to make better use of each. Rail has the capacity. It needs investment in better real-time planning tools for Network Rail to manage the system optimally, in cab signalling allowing multiple trains into the same section of track space, higher velocity allowing freight trains clear routes through from origin to destination at 60 – 75MPH creates capacity on the Network, after all they don't need to stop to pick people up.

4: How can freight lower its carbon and air quality impacts.
Greater use of electric traction, both road and rail. The challenge when trying to move a heavy load is power consumption requiring re-charging at regular intervals. Should a method of "in transit" rapid charging be available, embedded within the transport infrastructure then this could be overcome. The recent suggestion by the Rail Minister to avoid mile after mile of wires preferring instead battery trains with charging capability along the route is the sort of thing that should and could be developed. The train and its carriages can be the battery, deployed along the length of the train avoids a heavy traction unit housing a very large battery. The option to move goods by sea to a port closer to the destination should also be considered a priority.

5: How could new technologies be utilised to increase the efficiency and productivity of UK freight?
New technologies in freight such as digital signalling, platooning and autonomous vehicles will all be important to the future of freight movement in the UK and need to be pressed into service. The use of real time traffic information by humans is available today (Satnav). This has often been found to lead to a truck being stuck down a small local road not capable of taking it. The introduction of AI into the mix may lead to better decisions, however, once a problem starts to unfold traffic tends to divert to known alternatives moving congestion from one place to another very quickly. The AI may continue to optimise the journey by taking the delivery further and further away from its destination whilst keeping it moving. It will really come down to the objective programmed into the AI device.

A way in which AI could be useful would be to consider the traffic conditions prevailing and take trucks off the road until the conditions improve, this will be unpopular as it will add uncertainty into business supply chains, many of which are optimised to minimise stock holding.
A piece of technology which could have a significant impact would be a method of identifying all empty trucks and containers moving along the roads. The technology should be designed to either connect them to a movement to optimise the movement of the vehicle or move the empty unit to a location where it can be transferred to rail to move it to its destination. It is suggested many vehicle movements on UK roads are not actually carrying anything.
Changes in regulation should be focussed on creating the right environment to allow modal shift, re-balancing road and rail. The charging structure needs to be addressed in support of this. We should consider investments in rolling stock capable of moving large heavy freight trains using new power train systems and a planning system to allow Network Rail to optimise the network.

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National Infrastructure Commission

Freightstudy@nic.gsi.gov.uk

Freight Study Call for Evidence
National Infrastructure Commission
5th Floor
Eastcheap Court
11 Philpot Lane
London
EC3M 8UD

Date 5th March 2018

Dear Sir / Madam

Re: Freight Study Call for Evidence

Thank you for the opportunity to contribute to this consultation.

Tarmac, a CRH company, is the UK‟s leading sustainable building materials and construction solutions business. Our innovative services and solutions help to deliver the infrastructure needed to grow the economy today and create a more sustainable built environment to support our future prosperity. We employ approximately 7,000 people at more than 350 operational locations across the UK and are the largest manufacturer of cement and lime with facilities based in England, Wales and Scotland.

General Points

Tarmac has invested significantly over many years in increasing its rail capability and is looking for further opportunities to do so. The benefits of bulk rail transport include lower CO_2 per tonne transported and removal of HGV movements from public highways, with one aggregate train removing up to 60 HGVs from the road. Rail freight also has far lower NO_2 and particulates emissions. With regards to this call for evidence, Tarmac‟s key areas of interest/concern are:

- **Congestion**
- **Air Quality**
- **Safeguarding of depots, wharves and operations during planning processes**
- **Infrastructure for alternatively fuelled vehicles (AFVs)**
- **Strategic, secure supply chain for long term infrastructure development**
- **Continued investment in developing freight infrastructure**
- **Development of rail and water freight**
- **Road maintenance and funding**
- **Tarmac favours an integrated transport solution – a multimodal approach is required**

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Registered address for all companies: **Portland House Bickenhill Lane Solihull Birmingham B37 7BQ**

Portland House Bickenhill Lane
Solihull Birmingham B37 7BQ
0800 1 218 218 enquiries@tarmac.com

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Questions

1. What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?

1.1. What do you see as the key drivers to a successful freight system that is fit for the future?

The rail freight network and mineral product handling facilities such as rail depots and wharves need to be safeguarded from competing uses such as passenger trains and housing developments. The call for evidence references „water" as a mode of freight conveyance, clearly the loss of a wharf is likely to have a significant impact on the ability of this mode to support ongoing infrastructure development. A strategic and stable mineral product supply chain is needed to achieve any long term infrastructure plan. There is a need for additional freight capacity to increase low-carbon transport of construction materials into developing urban areas and other key locations. It is important to ensure that local planning decisions do not hamper the use of freight transport infrastructure. Planning constraints for operations can affect the supply chain both at „source" and the end recipient. It is also important there is recognition that rail depots need to be integrated with road transport networks for local delivery of construction products to point of use.

Network Rail should be incentivised to provide quality rail freight capacity in the form of additional freight paths or improvements to existing paths. The average speed of a Tarmac loaded train is currently 16 mph because of the network paths, despite assets capable of doing at least 60 mph. There is a growth target for freight set by HLOS in Scotland. Tarmac supports this target and suggests the same target-setting idea in the rest of the UK could result in the increased capacity required and more efficient operation.

Road congestion is a key issue with regard to efficiency of freight, constraining the efficient movement of goods in urban areas, in particular for cities and large urban areas. Longer road routes where congestion is an issue can be assisted by improved use of rail infrastructure. Within some cities water freight can also support a reduction in congestion. Supporting evidence for this includes the publication, „Mineral products in London - Safeguarding London"s wharves and rail depots for future prosperity and sustainability"[1]. The right investment at the right time in infrastructure, road structure, alternative fuels and alternative modes of transport will drive success, however, these solutions need to be economically viable and sustainable.

Unlocking congestion on road and rail will improve supply chain capabilities, reduce emissions and improve business profitability. Developing new or alternative freight transport modes such as water transport will reduce the pressure in other areas. In addition, smarter thinking with regards to the use of network available (for example, the introduction of freight routes on roads similar to bus lanes) and also „consolidating" retail deliveries and the „numerous" small deliveries to large business buildings in urban areas into fewer trips will free up network capacity.

1.2. Which are the key freight corridors that matter the most? Where are the bottlenecks in the freight network, and what investments in upgrades could deliver the best value for money for freight efficiency and UK plc?

Rail

Key freight corridors for Tarmac include the midland mainline and capacity into and across major UK cities. The bottleneck at Leicester on this line is a particular cause for concern. Capacity into and across major UK cities, particularly London, Manchester, Birmingham and Leeds needs to be developed.

To improve freight movements on rail the average bulk train should be expanded to deliver more tonnage in fewer trains, but the network and off-network capacity needs to increasingly move towards a "norm" of 450 metre trains carrying 2,000 tonnes of product (2,600t overall) and operate at appropriate speed.

With regards to whole network electrification, freight operates across Network Rail routes so being able to do half a journey under electric power is of no real value, the whole network needs electrifying. With the announcement by the Rail Minister that diesel engines will be banned from 2040, there needs to be a clear strategy in place to meet this target, with rail freight businesses and manufacturers of locos consulted and certainty provided to them to ensure the strategy is deliverable in the timescales.

Roads

Significant bottlenecks on roads include the major urban areas – i.e. where freight and people mix. This includes orbital roads and key geographical crossings such as the Dartford Bridge, Kingsway and Queensway in Liverpool and the Thelwall viaduct. Where infrastructure developments are introduced, such as tolled roads, there needs to be focus on ensuring the new solution is „user friendly" or the new option could be used less and will not offer the full benefit to reduce congestion.

Longer road routes where congestion is an issue can be assisted by improved use of rail infrastructure. Within some cities water freight can support a reduction in congestion[1]. The screenshot from a live congestion monitoring map, provided by Transport England[2] demonstrates the key national areas of concern for road freight operators.

With regards to road repairs, there should be better coordination and forward planning using digital asset management techniques to ensure roads are maintained to a high standard, avoiding failures such as potholes to minimise repairs required.

1.3. To what extent are the economic benefits of freight factored into wider transport infrastructure investment planning?

Unlocking congestion will improve supply chain capability and carbon emissions, specifically with regard to Tarmac"s delivery to customers, the freeing up of congested areas of the freight network would mean speedier supply of road-hauled products including time-limited products such as ready-mixed concrete. With regards to the economic benefits of rail freight and the minerals industry benefit to the UK economy, Tarmac refer to the Rail Freight Group „Facts and Figures"[3] and the MPA supporting evidence „Economic Significance of the UK Minerals Industry"[4]. Despite the investment in HS2, there will need to be more investment to ensure the minerals industry has access to rail freight routes - this may have to be supported by private investment, however, processes need to be improved to facilitate this. Tarmac would be willing to discuss this in more detail with the NIC on a confidential basis.

For freight transported by road, the cost of congestion is significant to business. The document „An introduction to the department for Transport"s road congestion statistics" section 2.3[5] highlights the effects of congestion; „*Although increased demand for the road network can often be driven by economic growth, the presence of congestion can also hold back further growth as more time is spent travelling at the expense of other productive activities. In addition, the inability to accurately predict journey times due to congestion can result in wasted time as individuals either arrive late for appointments or arrive early by allowing too much time for their journey.'* Freight will also arrive late.

Further investment in solutions to reduce congestion, including a modal shift of freight to rail would benefit the essential deliveries of construction materials that have to complete the final part of their journey to the point of use by road. The benefits of rail freight are listed in the excerpt from the Rail Freight Group"s website - „Facts and Figures", supported by the Office of road and rail[6].

The right investment at the right time in infrastructure, road structure, alternative fuels and alternative/smarter modes of transport will support in overcoming these constraints, however, these solutions must be economically viable and sustainable.

1.4. What are the regulatory and legal issues that, if changed, could improve freight efficiency without increasing costs or reducing efficiency?

An important part of improving freight efficiency is to ensure that the existing capacity is utilised well, this can be done by ensuring that local planning decisions do not hamper the use of freight transport infrastructure. The safeguarding of rail depots and wharves is essential to maintaining access to the construction materials needed to develop infrastructure, this is reflected in the National Planning and

Policy Framework (NPPF). To support further use of rail and water transport, in the short term existing depots and wharves could benefit from more flexible planning permissions to utilise capacity. Government and Local Authorities must be careful that in efforts to reduce air emissions, action plans do not hinder the use of rail freight by reducing capacity or inappropriate constraint being placed on planning. It is important that other developments, such as housing, are not given precedence. Planning conditions that restrict the supply chain include the planning given to operational sites and delivery time restrictions at the final destination, which prevent more time-flexible deliveries. Such planning restraints can be applied at both ends of the supply chain and need more flexibility to support freight capacity utilisation.

The „Why is Rail Freight vital for Housing and Construction"[7] document published by the MPA and the Rail Freight Group states that the Rail Freight industry needs; *'Better protection in the planning system for existing and potential railheads and wharves and the encouragement of new rail freight infrastructure where appropriate. Ensuring that adjacent development to railheads and wharves does not constrain rail freight activities.'*

Under a review of road haulage regulation, weight capacity could be changed to allow additional tonnage to be carried by HGVs. For example, rigid tippers currently have a limit of approx. 20 tonnes gross, but this could be increased to 30 tonnes if regulations were amended to allow 5 axle rigid tippers that could carry 50% more material, without increasing wear on roads.

The provision for both a stable source of supply of mineral products and appropriate freight capability will facilitate a more coordinated response to housing demand and correlating infrastructure requirements.

2. How might the demand for freight develop and change over the next 20-30 years?

2.1. How has the demand for freight, and types of freight, changed over the last two decades, and what will be the drivers for changes in the future?

There has been a clear move from road to rail in the transportation of construction products in recent years. This is due to a number of factors including economics, increasing importance of large quarries, service and longer distances of product transportation. In the future, the model is likely to develop in the use of large quarries and cement plants providing important construction materials into cities and large towns to make products such as ready mixed concrete and asphalt in line with economic development.

With regards to road freight, population increase in urban areas has driven freight transport developments. If left unchecked, the growth of internet shopping will dilute the end delivery process, increasing demand on freight infrastructure. In the future, digital asset management will be used to manage the road network better, providing early indications of failures that will reduce the need for road closures and road works.

The growing need for low carbon construction materials to fuel economic, housing and infrastructure growth areas such as large urban conurbations, in addition to the changing demands of consumers, will drive the need for smarter use of existing freight networks as well as ongoing investment to develop networks to meet the needs of all end users.

2.2. How is the freight industry planning for future changes in the demand? What levers might be available to shape future demand for freight transport?

Many mineral products, including, for example, asphalt and ready mixed concrete are time-limited materials and need to be made to order. The end customer will dictate when they need these materials and this in turn will create strain on the supply chain, depending on the supply chain"s ability to store materials (for example a large depot will have more capacity than a smaller unit). The ability of the supporting freight system to maintain supply of mineral products is key to ensuring a consistent flow of construction materials to where they are needed including urban growth areas. Tarmac has invested in rail transport and is switching to rail rather than road where possible - rail is a more sustainable, lower CO_2, lower emissions option. Rail freight can support in measures to solve carbon, congestion and capacity issues. To realise continuing development of rail freight options, increased capacity is required. An increase in internal rail capacity would maintain the competitiveness of domestically produced products versus the threat of imports – for example, according to MPA figures[8], imports of cement are now approaching 20% of that used annually in the UK. In addition, low cost, low carbon rail freight transport in the UK would support investment in the UK. As previously stated, there will need to be a clear strategy to replace diesel locos on the UK railways.

There are a number of challenges within the freight industry for which the industry is developing solutions. This includes the following:

- Skills (in particular loco drivers).
- The next generation of rail locomotive.
- Ability to connect new facilities (for example quarries, city centre locations, regional distribution centres) to the network without huge cost and time issues with Network Rail processes.
- Planning challenges and mainline capacity for growth around passenger aspiration.

With regards to road freight, future trends will mean moving towards alternatively fuelled vehicles - infrastructure will need to develop to support the new types of transport methods. Articulated HGVs offer the benefit of delivering approx. 30 tonnes of bulk construction material versus approx. 20 tonnes capacity of a rigid tipper. However, customers perceive a safety risk with this type of delivery. The use of a „walking floor‟ articulated lorry eliminates much of the perceived risk of the articulated lorry tipping, but this transition can be improved further by improved site management during the safe delivery of materials. Greater use of these increased payloads can support a reduction in deliveries required. Tarmac is investing in walking floor articulated lorries - greater support of this delivery method would result in fewer movements and support Tarmac‟s strategy in this area.

3. What effects does congestion have on the efficiency of freight movement and emissions?

3.1. How does congestion impact upon the productivity and economic contribution of freight? To what extent does congestion affect changes to mode, time or other freight choices?

For all freight transport modes, congestion causes a significant impact including decreased efficiency, increased emissions, additional cost & poor service. When vehicles are stuck in traffic and engines idle, deliveries are slower, there are fewer completed and therefore there needs to be more vehicles on the road to complete deliveries in line with the demands of recipients. As previously noted, the average speed of a Tarmac loaded train is approx. 16 mph because of the network capacity which affects asset utilisation. Please see Tarmac‟s response to question 3.3 for further information.

3.2. How does congestion affect the environmental impacts of the movement of freight?

Congestion increases the emissions associated with freight transport. Rail is the best way to decarbonise the supply chain and this is the case for Tarmac, however, the safeguarding measures suggested need to be implemented to continue the development of this mode of freight transport.

3.3. With limited space for new infrastructure, how can we better use our existing urban network to support freight? Are there changes – such as changes to modes, methods, or delivery times - that could help reduce the stress on the urban transport network?

Population and consumer activities are developing faster than technologies to develop freight transport. There needs to be a more resilient network in place, including depots and stockpiles of materials, but this is harder in cities where development of land is difficult to achieve. Ready-mix in particular is a perishable product, this is an example where congestion risks the supply chain for construction projects.

Rail freight becomes more competitive over shorter distances in more congested urban environments. Examples of Tarmac applying economic short distance rail freight to an urban area to ease congestion include Greenwich wharf to central London ready-mix and Tunstead to Manchester asphalt depots. This solution also significantly decarbonises the transport of these construction materials. It is vitally important that the National Infrastructure Commission do not forget this model, where materials are supplied from source into the centre of cities. Tarmac asks the NIC to consider the “right” mode and then plan infrastructure accordingly. The more congested the road, the more need there is to move the freight to rail.

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The Draft London Plan includes suggestions to encourage of out-of-peak deliveries and a modal shift from road to rail which supports Tarmac"s freight strategy and should lead to a decrease in congestion on roads. However, on site planning and working practices need to be flexible enough to accommodate the opportunity that out-of-peak deliveries bring. The improvement of public transport and other measures will encourage fewer cars on congested roads freeing up capacity for freight. For example, park and ride schemes, buses and trams transporting people from outside cities into cities.

4. How can freight lower its carbon and air quality impacts?

4.1. Are there efficiencies within freight management and distribution practices that could help reduce the CO_2 and NOx emissions from freight?

Greater utilisation of rail networks will support carbon and air quality impacts, with the ultimate goal of a network capable of electric freight provided by a comprehensive, achievable strategy for electrification. This will be supplemented by operating larger trains - more tonnage in fewer or longer trains is significantly more carbon efficient. This would be supported by maximising use of water freight. Freight by road would be greatly supported by reducing congestion caused by the frequency of vehicle movements associated with home shopping. The introduction of consolidation of deliveries, for example, could support a reduction of this traffic. In the future, the development of technology and infrastructure to facilitate delivery by Alternatively Fuelled Vehicles (AFVs) from depots and manufacturing sites has the potential to decarbonise the final journey of products to their point of use (see below for further comments).

4.2. What role do alternative fuels such as electricity, Liquid Petroleum Gas and biofuels have to play? What are the barriers and challenges to wide-scale uptake of alternatives to diesel and what could be done to help remove these issues?

Alternative fuels will have a huge role to play in the future, however, they are not currently financially viable and do not have the infrastructure (for example charging points for electric vehicles (EVs), gas stations for gas HGVs). The asset cost to switch to alternative vehicles is also high. To move towards cleaner vehicles, there needs to be development of their fuelling infrastructure and support with the costs of vehicles that are more expensive than their diesel equivalents. Whilst electric or hydrogen may be the most likely fuels for the vans and cars of the future, electric powered HGVs are less likely to be viable in the near term than gas fuelled HGVs. Indeed, Tarmac has trialled hydrogen fuel cells in vans and gas-fuelled HGVs with mixed results using current technologies and infrastructure.

An electrification strategy needs to be a priority for rail - a locomotive engine is a 30 year asset, the recent change of policy will cause issues for freight operators and locomotive manufacturers. Freight network and capacity decision making needs consistency and clarity in policy and ongoing certainty to enable businesses to plan their investments. A failure to design and deliver a complete strategy for electrification will cause problems for those businesses operating in this area.

4.3. What technologies could best and most realistically be utilised to manage the carbon impacts of freight, both within urban areas and on longer strategic journeys?

Initially, the modal shift from road to rail will play a key part in reducing carbon emissions of freight. The electrification of the rail network will be key to supporting a reduction in carbon impact of freight in the longer term. However, policies, support and investment needs to be right. Urban transport of the future is most likely to be supported in this respect through the use of hydrogen and electric fuelled vehicles, for which, there is not the supporting infrastructure in place. However, there is currently very little publicly available research for alternatively fuelled HGVs.

5. How could new technologies be utilised to increase the efficiency and productivity of UK freight?

5.1. How will new technologies change the capacity and performance of the freight transport network? Over what timeframes might these new technologies begin to affect the freight transport network?

The technologies likely to influence the productivity of freight include the planning tools and telematics for distribution networks and autonomous vehicles. With new software the planning of deliveries into complex networks should be improved. This will become increasingly important for route planning and consolidation.

Autonomous vehicles may have a further role to play, the removal of the need for a driver may change approaches to freight vehicles and open up new possibilities for alternative modes (drones for example). Again, advancements in these areas could release capacity for bulk haulage of construction materials to where they are needed. Any use of data such as real time traffic information, needs to be treated carefully with regards to driver distraction, however, it could be used to plan the journey of goods more effectively in advance of a delivery vehicle being loaded.

To improve the overall freight network in the UK, the long term outlook may be that „retail" freight (i.e. the significant numbers of small items delivered into urban centres) is tendered for, with companies utilising new technologies and alternative thinking to impact the current „system" through fewer direct deliveries to the end recipient, deliveries may need to be to localised „holding" centres to reduce the number of delivery vehicle movements. This would open up the network for bulk, single delivery haulage, such as that completed by Tarmac when delivering to construction projects. Another example of changing of approach would be for groups of shops/the council to tender for refuse collections to reduce the number of refuse wagon movements in certain locations (i.e. where individual businesses each have their own waste collection contract, movements could be reduced by grouping them together).

5.2. How can the use of data such as real-time traffic information by artificial intelligence and machine learning systems help to improve freight efficiency and productivity? How might this affect the business models and requirements of freight in the future? Are there any barriers to the greater use of data in freight?

For road haulage, getting the information to a driver would be an issue due to risk of driver distraction. There are significant barriers to making this work. Whilst further information provided, as suggested above, may help to keep people such as freight operators and end customers informed, the freight networks will still need to be prepared for increasing amounts of construction products required for fuelling infrastructure and economic growth. It is the end user that demands the timing of a delivery. Currently, it is mainly good management of existing capacity and developing additional capacity that is required for more efficient delivery of bulk freight rather than more information.

5.3. How do you see technologies such as HGV platooning, digital railway signalling, and autonomous vehicles being integrated into freight distribution?

Tarmac do not currently understand the benefit of platooning of HGVs carrying mineral product. Platooning would appear to only work on main trunk routes, not in cities. There could be safety issues - turning off roads for example. Not enough is known about the viability or detail of this idea and it needs more research. It is also important to note that if the same size of HGV is used, it wouldn"t appear to be able to positively influence congestion issues. The main benefit for autonomous vehicles is improved safety, however, the realisation of such technology could also support in the event of a national shortage of the correctly skilled drivers. Autonomous vehicles in the future have a significant role to play in towns and cities, for example in use as taxis and buses.

Digital railways could be an influential development, with the potential to increase capacity on mainlines and also reduce/withdraw the cost of adding new terminals to the mainline, the benefit to rail freight could be significant. One aspect of developing the rail freight network is the need to improve access of goods onto the network at an economical cost to the user. The digital railway needs to be geared up to facilitate the reduction of road congestion by utilising the network better as it passes product sources (the starting points of supply chains), and allowing for new and efficient end distribution points. However, there are significant issues that currently prevent the installation of rail links on and off the network in the form of planning, processes and huge costs involved. Government should review these issues and support to streamline the processes and reduce cost to open up these options and make them more efficient - capacity can be unlocked by allowing signalling to more terminals and quarries. The „retrofitting" of digital railway principles will be challenging on the UK rail freight assets and infrastructure.

5.4. How might regulations and physical infrastructure need to adapt to new technologies and business models in the freight sector?

The infrastructure to support new technologies will be a significant issue. Conductive roads for example would support electric vehicles (EVs), but there is no blueprint for this currently. Infrastructure also needs to be considered e.g. new garden towns. For example, Milton Keynes would be a good example of how traffic flows - through dual carriageway, roundabouts and 60 mph speed limits. Delivery and freight specific routes (similar to bus lanes) could support improved transport of goods. Although major cities can"t be rebuilt, there would need to be a review of what models work in urban areas, successful models also need to include the right public transport networks.

6. Are there good examples internationally of freight systems, policy, infrastructure or technology development and implementation that the UK can learn from to increase freight efficiency and/or reduce the carbon and congestion impacts?

Countries in Europe such as Norway (in particular the city of Oslo), the Netherlands and parts of Germany are recognised for their developments of EV infrastructure. Many European city centres are well managed with regards to public transport, the systems focus on where people can get in and out of urban areas easily freeing up capacity for freight. Alternative freight transport solutions include examples such as the underground delivery routes at Euro Disney near Paris.

Other Issues

With regards to other issues not raised by the call for evidence, the funding for councils to properly maintain roads is of key importance. With the right funding/management mechanisms and planning, there is opportunity to get road maintenance „right first time" and coordinate utility work to reduce the amount of road works undertaken, for example, through deployment of digital asset management. Improved quality of works will make the road system more robust.

The NIC should consider the need for engagement between the NIC and Department for Transport, local cities and planners to ensure that the right „smart" decisions are taken holistically to ensure future plans to improve freight networks are viable and deliver the improvements required.

I hope that you find the above comments of interest and use. If you do have any questions resulting from the above, or would like to discuss the points raised in more detail, then please do not hesitate to contact me.

Yours faithfully,

[Name redacted]
[Job title redacted]

References

[1] „Mineral products in London - Safeguarding London"s wharves and rail depots for future prosperity and sustainability"
http://www.mineralproducts.org/documents/Mineral_Products_in_London_Safeguarding_Wharves_and_Rail_Depots_Nov2017.pdf

[2] http://www.trafficengland.com/#map-menu-traffic-information

[3] **RFG -** http://www.rfg.org.uk/rail-freight/facts-figures/

[4] **ECONOMIC SIGNIFICANCE OF THE UK MINERALS INDUSTRY**
The Mineral Products industry directly supplies industries with a combined turnover of £495 billion and provides the foundations upon which our economy and society are built. The buildings and structures enabled by the Mineral Products industry enable more efficient transport, energy, water and sewerage networks, improve better health and education outcomes and provide homes.

210mt UK Mineral Extraction
£15Bn Turnover of mineral extraction including coal
£68Bn Turnover of mineral products manufacture
£5Bn Gross Value Added (GVA) of mineral extraction
£22Bn GVA of mineral products manufacture
£209Bn GVA of „first use" markets
£235Bn Total GVA of mineral extraction, product manufacture and first use markets
16% Share of the UK total economy directly attributable to minerals
34,000 People directly employed in mineral extraction
4.3m Jobs supported throughout the supply chain

Source: "The UK Mineral Extraction Industry" (CBI, 2016)

http://www.mineralproducts.org/documents/CBI_UK_Mineral_Extraction_Industry_2016_2.pdf

[5] „An introduction to the department for Transport"s road congestion statistics" section 2.3
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/527880/an-introduction-to-dft-congestion-statistics.pdf

[6] **RFG - FACTS & FIGURES**
Rail freight is vital to Britain"s economic success. It contributes £870m to the economy and plays a big part in reducing congestion and carbon emissions.

- The total volume of rail freight moved was 17.2 billion net tonne kilometres in 2016-17. Rail freight columns increased by 60% from the mid-90s until 2013-14 (when it was over 22 billion net tonne kilometres), but the rapid decline in coal traffic means volumes have fallen since then.
- Freight train movements totalled 224,000 in 2016-17, an average of 613 a day.
- Rail freight operators have invested £2bn since the mid-90s to improve services. Trains are now faster, more reliable and able to carry greater volumes.
- One in four sea containers arriving at UK ports is carried inland by rail
- Each freight train takes about 60 HGVs off the road
- Freight trains achieve over 95% reliability in on-time performance
- Every year, freight trains transport goods worth about £30bn – everything from televisions, clothes, whisky and Christmas decorations to construction materials, steel, cars and waste paper.

For the latest statistics produced by the ORR (Office of Rail and Road, check the „freight rail usage" at
http://orr.gov.uk/statistics/published-stats/statistical-releases
See also Network Rail"s rail freight pages
https://www.networkrail.co.uk/industry-commercial-partners/rail-freight/

[7] "Why is Rail Freight vital for Housing and Construction" document published by the MPA and the Rail Freight Group: http://www.mineralproducts.org/documents/Rail_Freight_Brochure_141116.pdf

[8] http://cement.mineralproducts.org/documents/Annual_Cementitious_2001-2016.pdf

From: [Name redacted] [Email address redacted]
Sent: 05 March 2018 19:54
To: Freight Study
Subject: NIC - Freight Study Call for Evidence

RE: National Infrastructure Commission – Freight Study Call for Evidence

Please accept the following comments from Buckinghamshire County Council with respect to the NIC Freight Study call for evidence:

I would like to bring to your attention the impact freight is having in towns and rural areas for which local roads are not designed to withstand HGV movements. Large amounts of the road network are unsuitable for freight and this is having a negative effect on things like infrastructure, e.g. road safety, air quality and noise and vibration.

In counties like Buckinghamshire where the potential to generate rail freight is limited, the road network plays a key role in carrying freight. As we continue to see a rise in LGVs and the number of HGVs begin to reach their precessions levels, the strategic road network is going to become increasingly more important and as such should remain as attractive as possible for haulage operators.

In terms of evidence and to quantify the scale of the problem, Buckinghamshire County Council consulted for two weeks in 2017 to understand the types of challenges facing local communities to inform our emerging Freight Strategy (currently out for public consultation). The response was unprecedented and we received 1092 responses, these were a mix of quantitative and qualitative data and provided a rich picture of the extent of challenges facing communities living in rural areas caused by inappropriate freight movements. Feedback ranged from HGV speeding, impacts on air quality, road safety concerns, rat running, inappropriate parking, damage to restrictions and infrastructure, littering, noise and light pollution and restrictions not being enforced.

In response, we are developing a Draft Freight Strategy that takes into account a holistic approach to manging freight and balances the need for efficient distribution of goods and services with the needs of the environment and society.

I hope you find this evidence useful.

Regards

[Name redacted]
[Job title redacted]
Growth and Strategy
Transport, Economy and Environment

Buckinghamshire County Council
7th floor, New County Offices
Walton Street, Aylesbury
HP20 1UA

Tel: [Telephone number redacted]
Email: transportstrategy@buckscc.gov.uk

Buckinghamshire County Council

Visit our Web Site : http://www.buckscc.gov.uk

Buckinghamshire County Council Email Disclaimer

National Infrastructure Commission - Freight consultation

FTA Response: March 2018

Introduction

The Freight Transport Association (FTA) is one of Britain's largest trade associations, and uniquely provides a voice for the entirety of the UK's logistics sector. Its role, on behalf of over 16,000 members, is to enhance the safety, efficiency and sustainability of freight movement across the supply chain, regardless of transport mode. FTA members operate over 200,000 goods vehicles - almost half the UK fleet - and some 1,000,000 liveried vans. In addition, they consign over 90 per cent of the freight moved by rail and over 70 per cent of sea and air freight.

Overview

Logistics is vital to the UK. Everything that business and people use or consume is or was a piece of freight. Every day offices, factories, workshops, work sites, retail outlets, hospitals and schools all have to be kept supplied in order to function.

UK society requires around 2.5 billion tonnes of goods to be delivered each year – that is about seven million tonnes of goods every day of the year. Without these the UK would not function. It is carried out daily by a vast array of people and companies, with huge efficiency and accuracy. So much so that it is simply taken for granted most of the time. It is only when the supply chain stops (such as closures at Dover, the ash cloud closure of air cargo deliveries in 2010, or the recent example of KFC restaurant's supply issues) that it is noticed.

Yet too often public policy consideration of freight only considers the negative aspects of freight – how do we manage the safety, environmental or congestion implications of goods movements – rather than how to enable freight to become even more efficient. Freight costs are a cost to UK society – a friction cost on the economy. Anything that reduces freight costs reduces the cost of living, and of doing business, in the UK. Anything that adds costs marginally disadvantages the UK's international competitiveness.

FTA hopes this NIC study is an opportunity for Government to consider how to help logistics become even more efficient in the future, not just to manage externalities (such as safety of emissions), important as these are.

Looking to 2050, the key outcomes related to infrastructure that FTA seeks are:

- Smooth flowing high capacity road network – through physical enhancements, better management and better use by industry (and other users) via information technology.
- A higher capacity and lower cost rail freight system – via improved infrastructure resulting in greater service provision.
- Continued access to globally competitive air and sea freight services – through sufficient quality ports and airports (principally the major container ports, the UK's hub airport Heathrow and the airports specialising in air cargo flights).

- Increased automation of logistics movements which will both improve our safety record and allow greater flexibility about how and when logistics movement occur – via commercial development of such systems and regulatory change to facilitate and encourage their use.
- De-carbonisation of logistics via alternative fuels and power sources – through deployment of such vehicles accompanied with charging/fuel facilities, including possibly electrification of rail and road networks.
- Logistics movement to be as space and energy efficient as possible through consolidation into the largest possible form of transport – eg coastal/ro-ro shipping, rail freight and load efficient road freight vehicles (both for trunk journeys and urban movements) - through technological advances to make these options more practicable and safe, and infrastructure improvement and adjustments to facilitate them.
- Urban movements in smaller vehicles allowing increased frequency and tailoring of consignments to meet demand - through sufficient availability of land in the right locations within cities.
- An efficient regulatory framework which ensures that logistics policy issues are considered holistically across regulatory bodies, modes and geographies to ensure maximum efficiency.

These outcomes would give the UK reduced costs, improved international competitiveness, vastly improvement road safety, immense reductions in carbon and local air quality emissions and more efficient use of shared transport networks. This is the prize that is on offer that the NIC should set out a plan to deliver.

Specific Responses

In the rest of this paper FTA will respond to the specific questions set out in the Commissions' paper, based on our own understanding and interaction with members.

1. What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?

1.1. What do you see as the key drivers to a successful freight system that is fit for the future?

The most efficient form of freight is the largest amount in one movement that is suited to the job. The need to be energy efficient as well as to minimise the use of shared transport networks dictates that this will be true. Coastal or ro-ro shipping can move hundreds of containers in one vessel. A freight train can move 30 or more containers at one time, and the larger a road freight vehicle is the more it can carry so the fewer movements on the road are needed.

For the final mile the paramount need is for the right vehicle for the delivery, so this will be best served by the use of smaller vehicles such as vans in urban contexts, but in general if a larger vehicle can be used this should not be prevented. Consolidation in this fashion reduces costs, lowers energy use and minimises use of the transport system. It should be noted that consolidation in this fashion is not synonymous with named 'consolidation centres' – it is a part of standard operating practices where it is possible to be done.

The barriers for use of shipping and rail are the availability and costs of connections – terminals where loads can transition to the road network for final delivery. The barriers for larger road vehicles are (misplaced) concerns over road safety. Technological improvements can address much of the cost and safety concerns, but the UK's infrastructure will need to be tested and adjusted for their use as well.

1.2. Which are the key freight corridors that matter the most? Where are the bottlenecks in the freight network, and what investments in upgrades could deliver the best value for money for freight efficiency and UK plc?

The road freight industry generally uses the Strategic Road Network (SRN) for most of its journeys and needs that network to be reliable. However, freight requires connectivity to freight nodes such as ports and freight interchanges which are often off the SRN on primary routes built and maintained by local highway authorities and there is need to ensure that these routes are funded for all traffic including HGVs.

Consistent bottlenecks occur where strategic traffic meets with conurbation generated movements and that traffic is generally busiest around the working day. It is this mix of local traffic with strategic journeys which disrupts journey reliability. Temporary bottlenecks result from long running roadworks reducing speeds and capacity, and increasing congestion. Erratic bottlenecks occur with incidents on the road network that force closures – the UK lacks sufficient resilience in its road network to cope efficiently with such disruption (eg if the M5 is closed there is no viable alternative for serving the south west of England).

The planning of the whole road network needs to be well co-ordinated in the future. This includes plans by local authorities for roads below the level of the Strategic Road Network. The Government's plans for a 'Major Road Network' are a welcome step in this direction, but more is needed to ensure coordination between local authorities' roads programmes.

For rail, FTA endorses the assessment of use shown in Network Rail's Freight and National Passenger Operators' (FNPO) Route strategic business plan.

This plan includes information on planned upgrades and the freight benefits that they deliver for funders. In the longer term, the freight capacity and capability requirements necessary to achieve continued freight growth will form a key element of the 15-year Freight Plan, and FTA support the anticipated focus on five key strategic corridors:

- Felixstowe to the Midlands/North/Scotland
- Solent to the Midlands/North/Scotland
- Cross London
- Northern Ports and Trans Pennine capacity

For global sea freight connections, the major deep-sea container ports are of primary importance – as such as London Gateway, Southampton, Felixstowe and Liverpool. For European movements Dover and the Channel Tunnel are the most important but other ro-ro ports provide vital links too. West coast ports such as Holyhead, Fishguard, Liverpool and Cairnryan provide key links to the island of Ireland.

For air freight movements Heathrow is vital – it handles more than all other UK airports combined. Gatwick is the next highest volume freight airport. Other airports such as Stansted, Luton and East Midlands handle lower volumes but have vital cargo-only flights that are designed to suit next day delivery services – a key international business connector.

The quality of these ports and airports is vital to the UK economy – as are the road and rail links to and from them.

1.3. To what extent are the economic benefits of freight factored into wider transport infrastructure investment planning?

The economic benefits of freight are seldom factored into road investment planning as the Government investment is in the main focused on impacts on road congestion (as well as social objectives such as encouraging cycling etc). WebTAG assessments consider economic factors when congestion is not an issue – and therefore economic factors do not carry the same influence on decision making as clearing congestion. Clearing congestion does benefit freight, but there are other benefits which should be considered when planning infrastructure investment. For example, improved east-west connectivity would facilitate freight movement across the Midlands and North providing connections with the southern ports and supporting increased economic activity.

On rail, the DfT's strategy sets out both the economic and environmental benefits and the increasing contribution freight could make to the UK. Crucially, the strategy recognises the importance of a stable public policy framework. The importance of rail freight's role for the UK has been reflected in the recent strategies set out by the UK Government in 2016. The strategy is very clear that changing patterns of consumption (e.g. as driven by the rise of internet shopping and next-day / same-day deliveries) present challenges for the traditional operating model of rail freight and set out clearly that "the rail freight industry will need to innovate and respond to these challenges". These challenges are being actively addressed by the sector.

FTA would note the move to consider restricting night flights at an expanded Heathrow is an example of policy insufficiently taking account of the full economic impacts of freight services – a simple assessment of the direct value of the flights dos not do justice to the full role in UK connectivity.

1.4. What are the regulatory and legal issues that, if changed, could improve freight efficiency without increasing costs or reducing efficiency?

Flexibility over the size of road freight vehicles is the main regulatory restriction that should be reviewed. Larger vehicles result in fewer vehicles on the road (as the quantity of freight Britain requires remains the same). As the current Longer Semi Trailer trial is demonstrating, adjustments to maximum dimensions can be carried out in ways which result in improved road safety, as well as greater efficiency.

Any reform to road vehicle dimensions should be subject to an analysis of the potential impact on other modes – if it were to result in goods moving from rail to road it could reduce or eliminate the safety, emissions, congestion and efficiency benefits gained, from the point of view of the UK supply chain as a whole.

There are many other national regulatory restrictions on all modes of freight movements, but in general these are necessary, and will require less radical revising in the years ahead.

Local regulatory restrictions that impede efficient freight movements should also be reviewed. For example, the London Lorry Control Scheme has been in place in the same form since 1986 and restricts HGVs movements at night and weekends – preventing the gains that can be realised from night-time deliveries being achieved. The London government has also decided recently to specify what the design of HGVs should be. Inefficient local regulation of HGVs should be avoided at all costs – it is national government that most effectively drive change within the HGV market in a way that does not just add cost to the supply chain.

Industry needs certainty and time to react to new regulatory requirements – the UK should develop long term plans for how the regulatory environment will change to reflect emerging technology and social requirements (eg decarbonisation).

2. **How might the demand for freight develop and change over the next 20-30 years?**

2.1. How has the demand for freight, and types of freight, changed over the last two decades, and what will be the drivers for changes in the future?

For road freight HGV usage has remained broadly constant whilst the quantity of goods moved has increased. Operators have moved to make efficiencies in national movements through vehicle up-sizing, either through simply larger vehicles, more innovative practices such as the double deck trailer or use of the Longer Semi Trailer under the DfT's trial scheme. On urban movements there has been some increase in smaller vehicle use to meet customer need for frequent tailored deliveries (reflecting reduced storage space at retail and other sites as well as home delivery. However, it should be noted that in the main it is the service industry (eg gardeners, electricians etc) that is responsible for the increase in van traffic. Over 50% of van use is for these services, only around 30% is for freight purposes (only 3% of vans are used for parcel/home deliveries).

Rail freight's use of the network is changing, reflecting the new economic geography of the UK and the increasing importance of the retail sector. Rail freight is increasingly focussed on serving major cities and areas of population rather than traditional "heavy industrial" areas. This means increasing activity south and east of a line from the Humber to Liverpool, and means that rail freight services increasingly share key (and often constrained) infrastructure with intensive passenger services, which themselves are forecast to grow strongly over the next decade.

Container port traffic has grown – especially at the UK's south eastern deep-sea ports serving the Asia markets.

2.2. How is the freight industry planning for future changes in the demand? What levers might be available to shape future demand for freight transport?

The UK has one of the most efficient logistics industries in the world. This has resulted from a road freight industry that is a highly competitive market place with thousands of providers and no dominant operators. Therefore, individual companies will be setting their own competitive plans for reacting to future demand. Large fleet operators especially review their vehicles and driver resources according to where they estimate future demand from, as well as how to maximise efficiency. Much future planning is also focussed on how to manage regulatory risk – such as over the role of diesel as a fuel.

For rail, Network Rail's Freight and National Passenger Operators section work collaboratively with customers and key stakeholders to *e*nsure freight inputs (e.g. forecasts for future demand) are considered. Operators' investment decisions in train capacity are affected by certainty of cost and access to train paths over an investment life of around 30 years.

The levers for shaping future demand for freight are in reality not about freight. How much bread people wish to consume and at what time of day, is not a freight issue but a societal one. The logistics industry reacts to serve the needs and requests of the UK's businesses and people, and innovates wherever possible to do so in an efficient manner.

3. **What effects does congestion have on the efficiency of freight movement and emissions?**

3.1. How does congestion impact upon the productivity and economic contribution of freight? To what extent does congestion affect changes to mode, time or other freight choices?

FTA estimates it cost operators (and thus the UK) £1 per minute to operate an HGV. For all modes, congestion adds cost. The effects go beyond the actual minutes delay, as operators have to guarantee delivery, so possible minutes delay has to be factored into planning, reducing the efficiency of every movement on a route, not just those caught in congestion itself.

However, the cost of congestion is not the main driver of behaviour. In logistics, the customer's need is the central issue. If that need *can* be better serviced by another mode then that becomes more attractive. However, in the majority of cases this is not true as the alternative modes simply cannot do what the customer needs – different modes are more efficient over different distances and best suited to different parts of the supply chain. Even within road freight congestion does not drive retiming, rather it is driven by the freight customer's need for a goods at a set time to fit in with its operations and allow it to meet the needs of its customers.

The main response to congestion is to put more vehicles on the road – if a journey takes longer the amount of goods that can be delivered by one vehicle is reduced, so further vehicles have to be put on the road in response.

3.2. How does congestion affect the environmental impacts of the movement of freight?

This has a very significant impact. FTA has been informed by a manufacturer that for an HGV, breaking and accelerating back up to 30mph 3 times per mile triples fuel consumption, compared to cruising at a constant speed. This means both trunk road congestion and urban congestion massively add to carbon, and also air quality issues. It also adds to tyre and break wear, also creating extra air quality issues. We would expect a similar impact for rail.

3.3. With limited space for new infrastructure, how can we better use our existing urban network to support freight? Are there changes – such as changes to modes, methods, or delivery times - that could help reduce the stress on the urban transport network?

As urban road space becomes more congested, or is removed in favour of cyclist or pedestrian space, we need to re-examine the prioritisation of motor traffic road space. The test should be how much the vehicle is doing for society. Productive or necessary users of the road should be given more priority – ie buses, disabled drivers, multi-occupant cars and freight vehicles. For freight, one medium sized HGV can deliver as much as 10 vans, one van as much as several cars.

Currently UK urban infrastructure generally only prioritises the bus, through bus lanes. FTA believes these should be adjusted to take a more nuanced view of what an efficient use of road space is. For example, it could become a promoted policy to have lanes that are 'bus only' at rush hour but also open in addition to commercial traffic (but not, for example, single occupant cars) outside those hours.

In order to ensure efficiency of movements and deliveries, sufficient loading/unloading space must be available in urban areas. If this is removed or restricted it results in increased movements as vehicles search or wait for spaces, and increased cost for local businesses. If we wish to minimise movement through the largest suitable vehicle these unloading sites must allow sufficient time to unload a whole vehicle and delvier on foot to multiple adjacent locations (many are currently restricted to 20 minutes).

FTA has been working on initiatives to reduce noise and retime deliveries for many years with some success. The Association chaired Transport for London's Retiming Deliveries Consortium recently through which deliveries have been retimed at 530 locations across the capital, equating to over 166,000 vehicle movements each year. To enable more deliveries to be retimed, local authorities need to review night-time delivery restrictions such as planning conditions, licencing agreements and in the capital, the London Lorry Control Scheme. They should also actively promote it with local business to help support and encourage the use of out of hours deliveries – as Transport for London have done.

However, retiming away from the peak or the day time will only be an option for a tranche of the logistics market as customer need requires deliveries by a certain time. It can be viable for some major businesses which can put systems in place, or can afford staffing out of hours. But it will not be viable to the many others not in that position. However, future technology could allow more businesses to retime deliveries.

Alternative modes such as rail, water and cycle logistics have their role to play in maximising the efficiency of urban freight transport networks. Wharves should be preserved for freight use, and access to stations made available where possible. However, this will not be a mass solution for urban freight. It will have most beneficial application in specific projects that are located next to the waterway or rail access point. Waste movements, construction projects or retail outlets in stations would be the main examples.

4. **How can freight lower its carbon and air quality impacts?**

4.1. Are there efficiencies within freight management and distribution practices that could help reduce the CO2 and NOx emissions from freight?

Freight operators already consolidate their deliveries to ensure they are operating as efficiently as possible, as they are highly fiscally incentivised to do so (it is typically the last load on a vehicle where they make their profit). Encouraging local businesses to co-ordinate deliveries can in certain circumstances aid efficiency, especially where the deliveries are to a highly centralised location (dense urban high street, shopping mall, construction site, airport etc). Making the public aware of and encouraging the use of central collection points for their personal deliveries could also improve the efficiency of freight deliveries.

Many restrictions on commercial vehicles are out of date – for example the London Lorry Control Scheme has not changed since 1986 when lorries were much nosier and more polluting. Re-evaluating the restrictions on vehicles and allowing freight to deliver during the night will move some freight off the roads during peak times. Classing HGVs as equivalent to buses and giving them access to bus lanes would ensure they are not sitting in congestion and their engine is operating more efficiently, reducing their emissions.

Utilising rail or water services substantially reduces local emissions per tonne moved. This would have a direct benefit in urban areas where used. But perhaps the main opportunity from alternative modes is in contributing to reducing the UK's background level of emissions.

4.2. What role do alternative fuels such as electricity, Liquid Petroleum Gas and biofuels have to play? What are the barriers and challenges to wide-scale uptake of alternatives to diesel and what could be done to help remove these issues?

We expect electric to be the main alternative for lighter commercial vehicles, however the cost of procuring these vehicles is prohibitively more expensive than their diesel counterparts currently (though this should change in time). As well as investment in supportive infrastructure for an electric fleet, the capacity of the grid needs to be assessed in each area and upgraded where required. Many members who have explored making the transition to electric have reported that they have also been required to pay for the upgrade to the grid beyond their own site. It should be the responsibility of the network provider, and not the vehicle operators, to ensure there is sufficient power supply.

Despite promotional test models being publicly announced, electric is, in reality, not currently a viable option for heavier trucks. However, by the 2040/50 timeframe (or earlier if technology allows) this may no longer be the case. Prior to that, members are developing two main options:

One is electric hybrid, with the vehicle capable of running in zero-emission mode for a set number of miles, enough to compete journeys in urban centres, thus exponentially helping on air quality issues.

The other is gas. Depending on results from the DfT vehicle tests this year, it is hoped natural gas (both CNG and LNG) will provide suitable options through the 2020s and beyond. Sustainable non-fossil fuel gas may offer more environmental benefits and therefore be desirable, but questions remain about the levels of supply that are possible.

In order for industry to transition across to alternative fuels in the medium term (ie 2020s) it is essential that Government provides a definition of what is an ultra-low emission HGV – the type of vehicle it is prepared to support. There is still a high level of uncertainty over the Government's view. Therefore, manufacturers do not have certainty about what to make, and operators do not have certainty over what to buy. The Government must set a definition so that the necessary infrastructure can be planned.

Rail will need to transition to more environmentally friendly power sources than diesel over the very long term – possibly through progressive electrification of the network. The cost of electrification of the network has thus far proved prohibitively expensive, so development of alternative on board power sources may have to be pursued.

4.3. What technologies could best and most realistically be utilised to manage the carbon impacts of freight, both within urban areas and on longer strategic journeys?

See previous answer for technologies. Beyond this, consolidation of movements into as few vehicles as possible will, whatever the power source, bring further environmental benefits (even with electric vehicles, energy intensity and brake/tyre wear will remain issues). As safety technology evolves larger goods vehicles should be used to deliver the goods required in fewer movements.

5. **How could new technologies be utilised to increase the efficiency and productivity of UK freight?**

5.1. How will new technologies change the capacity and performance of the freight transport network? Over what timeframes might these new technologies begin to affect the freight transport network?

The first point that should be made is that the 'freight network' is mostly the shared transport network – ie the road and rail system. It may be technological and use developments in the private motoring/passenger sectors that could significantly constrain the capacity of the freight system.

However, in considering freight itself, the main constraint on capacity, as regards road, is the size of the vehicle. This is restricted at a lower level than many other European countries due to (misplaced) perception on road safety on the part of the public. As technological advances on collision prevention are made (such as future iterations of autonomous emergency braking, and increasing degrees of automation), the reality that larger vehicles make a safer system will have to be recognised. Thus, whilst larger vehicles are not in themselves a technological development, their use may be facilitated by one.

Longer term, automation could unlock significant efficiencies in the road freight sector. This will probably mainly come when vehicles can move unaccompanied (ie with no human occupant). The reason this delivers such benefits is it reduces the cost base, removes the human restriction (ie limited driving time over concerns re tiredness), and allows greater use at unsociable hours. To fully utilise this benefit delivery points would need to be fully automated too. It is this change, that could, more than any other, revolutionise the use the freight industry makes of the road network. It could bring about a massive switch to the use of the night, reducing day time need.

Such vehicles are, as a commercial proposition rather than testing, at least 10 years away and it could be 20 or 30. The variables involved are speed of technological development and public reaction, so are very hard to judge.

In rail, the Digital Railway (DR) is a rail industry-wide programme designed to benefit the economy by accelerating the digital enablement of the railway. Key benefits for the freight industry that the Digitalisation could provide, centre on the following areas:

- Additional capacity through enhanced signalling system capability delivering consistently higher train velocity and headway reduction
- Improved quality of freight paths with enhanced traffic management capability, adapting real-time changes for cross route flows across regional control centres. In itself, this the potential to improve the quality of paths, the interaction between freight and passenger services and overall network management
- Digitalisation could also optimise the nodal yard concept to align train paths by optimising of live network timetable data. There is an opportunity to create a wider traffic management network connecting the cross-London freight flows to the key radial intermodal corridors from the ports of Felixstowe, Southampton and London Gateway across London to the Midlands, North and Wales
- Train control and operation could be optimised if systems were capable of dynamic modelling of freight rolling stock capability

If these are delivered, it would result in significantly increased capacity and reduced marginal cost, thus increasing the desirability of rail for freight customers – as long as implementation costs are not prohibitive.

5.2. How can the use of data such as real-time traffic information by artificial intelligence and machine learning systems help to improve freight efficiency and productivity? How might this affect the business models and requirements of freight in the future? Are there any barriers to the greater use of data in freight?

Greater automated sharing of information between operators on freight movements could lead to both more efficient use of road vehicles and also increased use of rail freight and coastal shipping (as more movements can be consolidated into larger ‘single’ loads).

The extent of the gain will probably be marginal but consistent and continuing - well worth gaining but unlikely to transform logistics.

5.3. How do you see technologies such as HGV platooning, digital railway signalling, and autonomous vehicles being integrated into freight distribution?

HGV platooning may well be widely taken up as the cost of using it becomes lower and the technology is more proven. It is expected to have a beneficial but only marginal impact on road freight – current estimation is that it will result in small fuel savings, in a similar fashion as the double deck trailer has done. Whilst a fully qualified driver is required to be working at the wheel at every moment, benefits are limited to fuel savings. Due to the congested nature of the UK motorway network (in terms of junctions and traffic) even the fuel benefits may be less than other countries may see. It is most important as a development step toward further forms of automation.

Progressive iterations of automation are the more exciting area, and we expect these to come in in two ways. Firstly, further driver aides will be developed that will make vehicles much safer, significantly improving the industry's road safety record. Secondly, and later, vehicles will be able to operate in genuinely autonomous mode for periods. FTA would expect this to be available first on the major trunk roads where users such as cyclists and pedestrians are not allowed and the nature of the road is more of a closed network. This will primarily be of use (aside from road safety benefits) when drivers are able to not technically be 'driving', and hence the travel time not count towards driver's hours. This level of automation is some way off (see 5.1).

Digital Railway is, as outlined above of significant potential benefit to freight by increasing availability of services and reducing cost. The huge challenge is to find a cost-efficient way of delivering the programme or elements of the programme which does not make rail more expensive and less competitive.

5.4. How might regulations and physical infrastructure need to adapt to new technologies and business models in the freight sector?

As road vehicles become safer though technology, regulations regarding vehicle size will need to be reviewed. As drivers are progressively not required to be 'driving', rules assuming such a requirement will have to be changed – and new ones considered over appropriate use of automated systems.

As alternative fuels and power sources are developed, charging facilities suited to the new technologies will have to be deployed. Consideration of this should include electrification of parts of the road network to facilities heavier electric vehicles

Rail will need to transition to more environmentally friendly power sources than diesel over the very long term – so progressive electrification of the network or the development of alternative on board power sources will have to be pursued. The design of regulatory charges may need to change to enable this investment to take place.

6**. Are there good examples internationally of freight systems, policy, infrastructure or technology development and implementation that the UK can learn from to increase freight efficiency and/or reduce the carbon and congestion impacts?**

One key option from elsewhere in Europe to consider would be flexibility over maximum vehicle sizes and weights. Whilst other countries in European allow vehicles up to 60 tonnes on their roads, the UK restricts its vehicles to 44 tonnes. There is no genuine safety rationale for this and it holds back improvements in road use efficiency and environmental improvement.

The only genuine concern would be over impact on other modes – any reform would have to consider the impact on rail and water services, as a reduction in these could offset the benefits from larger vehicles.

Ashfield Land Management Limited
St. Catherine's Court
Berkeley Place
Clifton, Bristol
BS8 1BQ

NIC Freight Study: submission by Ashfield Land

Ashfield Land is an expert property company working across the commercial and residential sectors. Established in 1990, our offices in London, Bristol, Birmingham and Glasgow drive forward quality developments and create successful investments.

Ashfield Land and our development partner Gazeley are currently promoting a Strategic Rail Freight Interchange (SRFI) at Rail Central in Northamptonshire. Rail Central is a proposal in the pre-application stage for a 7.4 million sq ft distribution and logistics development, where the West Coast Main Line fast and slow lines intersect, adjacent to the A43 and within two miles of the M1 (at Junction 15A). The project includes two rail freight terminals, serving both traditional intermodal (container) freight, as well as the fast-growing ‘express freight’ market, through its unique location with access to all 4 tracks on the West Coast Main Line which pass on either side of the site.

Ashfield Land welcomes the NIC’s engagement in the Freight Study commissioned by the Chancellor. The resulting recommendations should be achieved without jeopardising the short term delivery of infrastructure projects currently underway or in the planning application phase. Ashfield Land advocates both road and rail based distribution and sees the need for both to provide choice and competition within the market place.

Carbon, Congestion and Capacity

These provide the correct focus for the NIC study and rail freight has a significant contribution to make with all three. Mode shift to rail is probably the most effective way of decarbonising a supply chain (76% less carbon per tonne mile, even with diesel locos, smaller still with electric locos powered from renewables) and reducing the number of HGVs (and thus congestion and serious accidents) on key arteries - as is already evident on A14/A34/M1/M4 corridors from the ports. Tesco has achieved a 50% reduction in its carbon footprint in recent years, in no small part due to the network of 6 daily freight services connecting its national distribution hub with London, Wales and Scotland – none of which would have occurred without the combination of SRFI development, and a determination by a major end user to fully exploit the rail opportunities.

The Need for a Multimodal Approach

Government's freight and logistics strategy should not be almost entirely road-orientated, as has been the case latterly and which could be inferred from the Terms of Reference for this study. Other leading European and global economies enjoy much greater rail mode shares. Rail matters - it is a mainstream logistics option and is a major player in key markets, notably consumer goods and construction. It is now far more than a 'bulk goods' niche player focussed on coal – with the conversion of the electricity supply industry to a more sustainable footing, the removal of coal traffic on the rail network is now being replaced by a greater emphasis on intermodal traffic (much of which carries consumer goods) which now accounts for over 40% of all GB rail freight - and can play a much greater role in future. The key factor is having rail-connected supply chain facilities, and a planning regime that encourages their creation through entirely private-sector investment (see below).

Urban and Interurban Logistics

There is considerable focus on urban logistics, but it is essential that the NIC understands that supply chains that end in cities originate in other areas. Almost all are regional, most are national and many are global. There is a continuum from point of production (in the UK or abroad) to the point of consumption in UK cities. Inter-urban transport infrastructure is thus of crucial importance to the successful economic and social functioning of cities, as well as to the UK as a whole.

The current supply chains which sustain urban populations and businesses involve multiple links, between national, regional and local distribution points, where goods tranship from articulated lorries, to rigid vehicles, to vans. The opportunity exists to replicate and/or rationalise these supply chains using multiple modes instead of multiple road vehicles, enabling rail to deliver larger volumes of freight direct from national distribution centres into outer-urban and inner-urban transhipment points, restricting road use to the last few miles of the journey. Tesco's daily rail service linking its national distribution hub at DIRFT with a regional distribution centre at Purfleet (a distance of under 100 miles by rail) eliminates over 90% of the road mileage which would otherwise be involved, the train taking around 80 lorry loads off the M1 and M25.

Rail transport is therefore not simply about large volume / long-haul traffic, with companies such as the Royal Mail and InterCity RailFreight demonstrating the ability to carry smaller volumes over much shorter distances, including individual parcels moved at high-speed on scheduled passenger services – in spaces originally designed for such use but largely ignored following separation of the railways into passenger and freight silos.

The limited range of electric HGV's (currently only c.100 km) means that battery technology will have to improve considerably to give a decent range without reducing payload to an unacceptable level. This problem can, however, be overcome if rail is used for the trunk haul, with electric vehicles carrying out the final leg.

There is scope for using passenger stations at night, and possibly between the peaks, for roll cage traffic if road access for vans is retained/provided – a practice that continued right through from 1838 to 2004. Euston station still retains the purpose-built "parcels deck" constructed 50 years ago to facilitate rail-based urban logistics. Overnight trials into Euston by Eddie Stobart, Sainsbury's and TNT between 2012 and 2014 proved the concept would still be valid today, albeit frustrated at present by the continuing uncertainty about the future of the Euston parcels deck, in the face of HS2 construction works and possible redevelopment of the station. The Rail Central site could access the Euston facility by rail within an hour, using an electric freight train to connect with electric delivery vehicles – a fast and zero-emission urban logistics solution, requiring zero investment in Euston station.

In Spring 2016, the Rail Minister spoke of the opportunity to use the rail network in this way to deliver into city centres, suggesting it was time for a "joined-up" approach to urban logistics.[1] A lack of demonstrable support for rail freight suggests little progress has been made in responding to the Rail Minister's challenge. The NIC should therefore place significantly more emphasis on these interurban links and solutions than was evident in the draft NIA. This applies to both road and rail infrastructure and to the interchange facilities needed to achieve a lower carbon/lower emission supply chain to, and within, urban areas.

[1] http://assets.dft.gov.uk/rail-industry-day-2016/claire-perry-speech.gov.uk.htm

Technological Innovation

Significant social and technological research is needed before any decisions are taken on the future role of radical new technologies in the transport system. This should include understanding fully the implications of operating connected and autonomous vehicles – especially HGVs – on motorways and trunk roads, including the effects on safety, congestion and modal split. We do not agree with the NIA view that platoons of lorries could largely replace rail freight, but instead believe that this would have strongly adverse impacts on congestion, capacity and carbon emissions. Platooning of HGVs does not reduce the number of lorries required and is thus not a solution to congestion - it could make emissions worse if, by making road more competitive, it took traffic off rail. If a road is then more congested in consequence, a platoon of lorries will be literally going nowhere. Whilst the impact of a single autonomous vehicle failing in service may be relatively minor, the consequences of system failure in a chain of 44-tonne lorries, linked only by electronics, remain untested and unquantified. There is a place for autonomous vehicles, drones, airships and hyperloops, but in the context of forming a suite of solutions rather than as a universal panacea.

Within the suite of possible solutions, less radical but potentially more transformative technologies can be applied. The aviation industry has for many years repurposed displaced front-line passenger aircraft into a second extended career as freighters or mixed-use "combi" aircraft. With over 4,000 rail vehicles destined to be displaced by new-build rolling stock, the current preference of train operators and leasing companies has been to scrap displaced rolling stock or leave them to rot. Thus most of the former fleet of 100mph vehicles used on Royal Mail services are now beyond repair; the 186mph first-generation Eurostar trains, capable of moving 150 tonnes of freight between the UK and Spain in a quarter of time taken by road haulage, are now being taken out of service and despatched, still in working order, for scrapping within sight of the SRFI at Birch Coppice. DfT, Innovate UK and RSSB are now starting to fund pilot research into repurposing of existing (and potentially new-build) rolling stock with flexible interiors, able to adjust to the needs of passengers, PRMs, cyclists, baggage and logistics. This is better late than never, but in order to fully exploit the rail freight interchange facilities being proposed at Rail Central, a fleet of suitable rolling stock will be required – sending state-of-the-art transcontinental high-speed electric trains to a premature end is rather counterproductive in this regard

Land Use Planning

Many more modal transfer points are needed for both consumer goods and bulk materials, especially in or close to the main urban areas and in the established NDC and RDC clusters around the UK. Investment in rail terminals and SRFI is entirely private-sector funded, without the need for taxpayer money: Government's role is to facilitate their creation via the planning system. Modal transfer facilities in an urban area need not sterilise valuable land as the air space above (or below) can be used for other purposes, as has recently been done in Paris with a consumer goods terminal, albeit effectively replicating what British Rail built for London at Euston over 50 years ago.

The Planning Act 2008 and the subsequent National Policy Statement on National Networks 2014 have been rare examples of positive public policy, along with the Development Consent Order (DCO) planning process for Nationally-Significant Infrastructure Projects (NSIP). Private sector developers worked hard to secure SRFI as NSIPs, based on the evidence of every SRFI constructed to date having spawned new rail freight services. Building on the original SRFI policy of the former Strategic Rail Authority, public policy has been the catalyst to private-sector investment, which in turn has achieved significant levels of freight mode shift – some 60 trainloads per day, the equivalent of over 2,000 lorry loads and 500,000 lorry miles, owe their existence in no small part to investment in SRFI.

This has created a virtuous circle, where a positive policy framework and a strategic planning process for NSIPs then leverages entirely private-sector investment, which then yields the very mode shift the policy envisaged, along with associated employment and decongestion / decarbonisation benefits. Here is an example of joined-up thinking between Government departments (principally DfT and DCLG, with apparent encouragement from HM Treasury), replacing revenue support grants with a more efficient use of policy and resources. As such, this is to be commended and encouraged.

Main Line Electrification

Whilst the Rail Central scheme is designed to accommodate both diesel- and electric-hauled freight trains, it is apparent that the UK lags way behind the rest of Europe in electric haulage of freight trains. The latest dual-mode locomotives now being introduced by train operator DRS have a "last mile" diesel capability for moving trains on and off electrified main lines into freight terminals, but the majority of the GB rail freight loco pool remains diesel-powered. The diesel pool ranges from between 25 and 60 years old, all of which will eventually need replacement due to age or technological obsolescence.

In the road haulage sector, Government (through Innovate UK and DfT) has recently funded pilot projects to encourage manufacturers and operators to migrate towards dual-fuel (diesel / gas) articulated lorries and associated refuelling facilities, the aim being to gradually reduce the dependence on diesel fuel whilst making alternative technologies more mainstream and affordable. For the railways, the relative ease of electrifying the infrastructure (current challenges notwithstanding) suggests the equivalent migration should be towards electric (or dual mode) traction, using similar incentives to encourage migration away from diesel as the prime mover.

Beyond this, making better use of the existing pool of disused and/or displaced electric locos and passenger stock (see earlier), combined with infill electrification, would allow a much greater share of freight to be moved by rail on traditional and express services. This also requires Government leadership, given the passenger-dominated industry has tended to focus solely on franchise requirements rather than "out of box" innovation.

Main line electrification in GB has at times created a new vernacular, with projects being successively paused, "unpaused," postponed or cancelled altogether. Projects such as Great Western, Midland and Trans-Pennine electrification, which would yield not only electric traction but potentially higher loading gauge clearances for taller containers, now appear to have stalled. The "electric spine" project linking the Port of Southampton with South Yorkshire has also suffered the same fate. Yet an increase of less than 10% of the extent of network electrification (300 miles above the current total of 3,339 miles) could enable almost 66% of rail freight to be converted to electric haulage.

Larger & Longer Freight Trains

ORR statistics indicate that between 2003-4 and 2016-7, average freight lifted (payload tonnes) per train has increased by 70% and average freight moved (tonne km) has increased by 66%. This reflects the work of Network Rail, train operators and equipment suppliers in continually pushing the envelope for freight train maximum dimensions – whether in length, weight, height or width. The current network maxima are 750m length excluding locos (1500m length trains being trialled in France), 4,400 tonnes excluding locos (6-10,000 tonnes on the continent) and W10/W12 loading gauge (at its tallest, close to the smallest of the continental UIC loading gauges).

Such progressive incremental enhancements are to be encouraged as part of the ongoing Strategic Freight Network initiative (another rare and welcome example of material support for the rail freight sector). Further technical innovation and network assessment are needed in the short term, given much of the West Coast Main Line was cleared to W10 gauge through better measurement and analysis, rather than through major structural works.

Expediting Main Line Access

It is acknowledged that the railways' enviable and world-class safety record in part reflects the considerable resources expended on trackwork, signalling and electrification, anecdotal evidence from the rail industry suggesting the safety-critical hierarchy placing rail above aviation and possibly on a par with the nuclear industry. Yet the concern remains that safety may be used at times as a smokescreen for cost inefficiency and escalation, Great Western Main Line electrification hopefully representing a tipping point for the costing of major rail schemes.

For rail freight, the cost and lead time for connection represents a major hurdle for all but the largest SRFI, where even for projects such as Rail Central, costs may still be significant. A simple single main line connection and crossover installed at a rail freight interchange on a freight-only line in the East Midlands in 2007 cost in the order of £2 million. In 2016, the same configuration on a similar freight-only line cost nearly £7 million. We are aware of reports of preliminary cost estimates for other single main line connections ranging between £31m and £50.

To have such steep escalation in as-built costs (250% in under a decade) and wildly-varying initial cost estimates, suggests a need for much greater transparency, cross-fertilisation and discipline in the costing of new connections – the current process has in part led to at least two SRFI projects and multiple RFI projects being cancelled. Digital railway should help, but this needs to be tested, and design/approvals timescales need to be considerably shortened.

The whole basis of developing new main line connections (where the promoter or end customer has to cover the entire upfront cost) is also open to question. Network Rail has suggested that, if allowed, an alternative would be such investment (and associated risks) to be borne in part or in whole by Network Rail itself, the investment then being amortised over the life of the infrastructure asset (notionally 25 years) and charged to the end user through an enhanced version of the current annual Connection Agreement. This would go a long way to reducing the investment exposure for those wishing to connect new sites into the network.

Successive post-war Governments saw fit to severely rationalise the rail network, with no attempt to follow continental practice in mothballing rather than destroying the trackbeds. Reflecting on the success of successive major reinstatement projects – Snow Hill Tunnel in London (creating the Thameslink service), the Portbury branch in Bristol (now being planned for passenger use) and most recently the Borders Line in Scotland - Government should now be providing the lead in identifying those disused rail corridors capable of creating strategic infill routes - such as extending the Borders Railway to Carlisle, the Woodhead route through the Pennines, the Manchester – Derby route via Matlock, and lines linking Leicester to Rugby.

With a strategic vision for the rail network as more than a token complement to the road network, Government has the opportunity to achieve a transformational shift in mode share for passengers and freight, creating conditions favourable for large-scale private-sector investment in infrastructure and services. We believe that our investment in Rail Central could be one of many more to come, with the right public policy framework and a commitment by Government to sustain it.

Liverpool City Region Response to National Infrastructure Commission Call for Evidence on Freight

1. What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?

1.1. What do you see as the key drivers to a successful freight system that is fit for the future?

1.2. Which are the key freight corridors that matter the most? Where are the bottlenecks in the freight network, and what investments in upgrades could deliver the best value for money for freight efficiency and UK plc?

1.3. To what extent are the economic benefits of freight factored into wider transport infrastructure investment planning?

1.4. What are the regulatory and legal issues that, if changed, could improve freight efficiency without increasing costs or reducing efficiency?

As an island nation, the UK's economic success has largely been founded on maritime trade. 95% of the country's international trade is handled through British ports and they are significant drivers of growth. While history has seen individual ports flourish and decline, their central role in facilitating commerce, migration and exploration has remained constant. Today, the UK relies on its ports and the supporting road and rail freight infrastructure to connect its producers and consumers to the global economy.

Global trends in supply and demand are driving larger shipping sizes and freight volumes, and the rise and fall of commodities and industries require the ports and logistics sectors to be responsive and adaptive to changing patterns of trade. These pressures have had cascading effects on national and regional infrastructure, with the road and rail networks already proving insufficient to meet the demand for higher capacity, efficient freight corridors.

Investment in infrastructure improvements on rail and road networks to and from Britain's international gateways such as ports and airports should be a high priority. Brexit is highly likely to increase trade between the UK and the rest of world, increasing the importance of investing in infrastructure improvements to Britain's international gateways to ensure sustainable and efficient access. This offers the opportunity for a wider range of ports to benefit from trade flows. There are some substantial competitive gains to be made through focusing on port-centric logistics, looking to ensure that imports and exports are able to use the port in closest proximity to their market/source respectively. For example, increased use of Northern ports offers the user reduced distribution time and costs for their goods, whilst also offering the UK net national savings through reduced lorry miles on congested infrastructure around London and the Southeast, whilst contributing to reducing air quality levels. It can also help rebalance the UK economy and ease pressure on overheating ports and transport networks in the South and South East.

Liverpool City Region acts as a hub in global trade routes and lies at a crossroads in them offering access:

Eastwards - to the Humber / Tees / Tyne and onward to the Baltic, Scandinavia, Russia and beyond. These global trade corridors are linked with east-west Transpennine (Liverpool to Humber / Tees / Tyne) and north-south WCML routes (Channel Tunnel and South Coast Ports to major cities in Midlands and North) within the UK

Westwards - onward to Ireland, Iceland, the Arctic, North America, Caribbean, South America, Africa and to Australasia and the Far East via Panama Canal

The Port of Liverpool is an important maritime gateway and is one of the UK's top five container ports. The largest volume and density of large warehousing (over 9k sq m) of any UK region is located within a 70 mile radius around Liverpool. It is likely that the Port of Liverpool will increasingly be seen as a preferred option; Liverpool's location at the heart of the UK offers a distinct advantage, with over 65% of the population of the UK and Ireland living within a 150 mile radius of the city. Port forecasts have indicated that rail traffic from the port has the potential to grow to around 38 trains per day per direction up from 12 at present, and work is underway by Network Rail to provide this capacity. In late 2017 it was announced that Peel Ports will launch container train services in 2018 from the Port of Liverpool to the Daventry International Rail Freight Terminal (DIRFT) (Malcolm Group) and also to Grangemouth Rail Freight Terminal (Malcolm Group) in Scotland.

The operator of the Port of Liverpool, Peel Ports, has invested £400 million over the past three years constructing Liverpool2, to create one of Europe's most advanced container terminals. Already 45% of North American container traffic enters through Liverpool and the Port can now accommodate over 95% of the world's vessels. As one of the most operationally efficient and modern terminals in Northern Europe, it is capable of accommodating the world's largest container vessels, future-proofing the facility to allow global shippers 'ship-to-door' access to major imports? and centres at the heart of the UK and with the ability to attract new deep sea container shipping services from around the world.

Overall, the ambitions and priorities being promoted by Transport for the North in terms of vastly enhanced West-East linkages between cities and city regions should be fundamental starting points for the Commission in setting priorities for infrastructure. These requirements are:

- **Network capacity optimisation in line with Network Rail's aspirations**, including the use of 750 metre trains on intermodal routes, the use of 20% more operational hours per week, as well as continued changes to maintenance regimes.
- **Securing additional paths for freight trains on the West Coast Main Line**. With a requirement for three paths per hour in each direction north of Wigan, six between Wigan and Crewe, and six south of Crewe. The development of HS2 may provide some additional capacity in the longer term on the WCML, if it leads to a net reduction of passenger services on the existing tracks. A further effective local measure in the long term may be provided by Northern Powerhouse Rail (NPR)

providing a new high speed passenger link between Liverpool and Leeds, linking to HS2, which could further contribute to relieving the WCML north of Weaver Junction.

- **Securing additional paths for freight trains crossing the Pennines**. The analysis has also indicated a need for two paths in each direction along the Chat Moss route. Similar to the situation on the WCML, the delivery of Northern Powerhouse Rail (NPR) may provide some additional freight capacity in the longer term on trans-Pennine routes, if it leads to a net reduction of passenger services on the existing tracks.

The city region has built up compelling evidence to support the national benefits of enhanced high speed rail connectivity to the Liverpool City Region[1], for example. Enhanced West-East rail connectivity across Northern England will also release capacity to support the major northern ports, including opportunities for the development of a chain of multi-modal logistics parks, building on assets such as the Parkside Strategic Rail Freight Interchange in St Helens. The difficulties of east-west movements on the rail network is highlighted by the example of the biomass train service between the Port of Liverpool to Drax which, due to a convoluted route, is inefficient and time-consuming with trains taking up to 10 hours to travel the 90 miles between Liverpool and Drax power station. However, with infrastructure improvements on the transpennine corridor, journey times could be reduced by 4-7 hours and become more efficient.

It is of concern that the Commission appears to reject modal shift and instead suggests that lorry platooning should be favoured due to capacity constraints. Lorry platooning, with driverless rear trucks, might cut costs for road hauliers but putting more freight on the railways would bring bigger and quicker reductions in congestion and pollution. Rather than relying on platoons of lorries on congested road networks, the focus should be on increased rail freight which could make a real difference to congestion and pollution on some of the country's most overcrowded roads.

The Combined Authority would argue that securing modal shift to rail and waterborne modes is key to providing greater capacity and sustainability. The public sector needs to be more active in supporting developers to bring logistics sites linked to the rail network to market; there are a number of such sites within the Liverpool City Region which require connections on to the mainline rail network in order to be viable. These include the former Parkside Colliery site, which could be a nationally significant Strategic Rail Freight Interchange if sufficient capacity on the Chat Moss line eastbound can be secured, and the Fiddlers Ferry power station site (once decommissioned).

In terms of regulatory changes, we need much better integration of land use and transport planning. Spatial Planning shapes the places where people live and work and the country we live in. Good planning ensures that we get the right development, in the right place and at the right time. It makes a positive difference to people's lives and helps to deliver homes,

[1] http://www.linkingliverpool.org/

jobs and better opportunities for all, whilst protecting and enhancing the natural and historic environment and conserving the countryside and open spaces that are vital resources for everyone. But poor planning can result in a legacy for current and future generations of run-down town centres, unsafe and dilapidated housing, crime and disorder, retrofitting of sustainable transport solutions and the loss of our finest countryside and green spaces to development.

Urban areas should ensure that their planning policies seek to ensure that all major new distribution parks are rail (or water) connected and seek to ensure that 'last mile' deliveries are completed by low/zero emission modes where possible.

The new landscape of city leadership, including metro mayors, combined with changing forms of mobility and ownership offer a new opportunity to tackle these challenges in a more strategic and systematic way. The Government should empower metro mayors through devolution of power, funds and resources to enable them to deliver what is needed for their local areas.

Infrastructure requirements must be set within the context of the economic ambition set at the national level through the Government's Industrial Strategy. There is a need for this to link with a spatial dimension through National Policy Statements and ideally a National Spatial Plan which currently is lacking. Relationship with housing policy, research & development and education / skills training policies is also vital.

There also needs to be place based delivery below national level through devolved bodies such as devolved administrations, sub-national bodies (especially Transport for the North), and county and city region authorities. It is vital that devolution is accompanied by appropriate devolution of both powers and resources. Again there needs to be synergy at these levels with economic ambitions set out in Growth Strategies and a spatial dimension through city region spatial plans and local plans.

Local knowledge and perspectives can be put to the best use to unlock the barriers to greater productivity growth if delivery, policymaking and budgetary powers are significantly devolved. The new landscape of city leadership including metro mayors and combined authorities is a good platform to start with for this devolution.

2. How might the demand for freight develop and change over the next 20-30 years?

2.1. How has the demand for freight, and types of freight, changed over the last two decades, and what will be the drivers for changes in the future?

2.2. How is the freight industry planning for future changes in the demand? What levers might be available to shape future demand for freight transport?

The Liverpool City Region has recently developed its own Freight and Logistics Strategy, identifying the interventions required of the public sector to support the growth of the freight industry within the City Region. The strategy has concluded that Rail is forecast to raise its share of LCR traffic from 8% to 13% - at a faster rate than for the North as a whole. This is because the LCR is less exposed to the forecast decline in the coal market, whilst developments at the Port of Liverpool and the increase in capacity of rail- and port-centric distribution parks in the City Region are forecast to result in significant additional intermodal traffic.

Step changes in container port capacity from the Liverpool2 scheme, allied to the availability of network capacity, will lead to significant increases in intermodal rail freight services to and from the Port of Liverpool, requiring additional capacity on the Bootle Branch Line and the Chat Moss Line to secure access to the WCML. At the same time, forecast increases in biomass traffic by rail from the Port of Liverpool to Drax in North Yorkshire will lead to an increasing requirement for additional capacity on the Bootle Branch Line, the Chat Moss Line and then across the Pennines.

While the City Region will need additional land made available for both road-only connected logistics space and distribution parks that are located on port estates or at rail-connected distribution parks, it is the rail- and water-connected capacity that will reduce user costs over longer distances and allow the LCR to gain market share in the national distribution market rather than compete with neighbouring areas in the North for regional distribution capacity.

Road freight volumes to and from the Port of Liverpool will put additional traffic onto the already capacity constrained A5036 route to Switch Island, highlighting the need to improve road access to the port.

Freight is a function of the industries that it serves, so changes to demand in the future will be guided by changes within the industries that need freight to be moved from place to place. Decisions to change factory locations in key industries, for example, will change the freight flows required and where factories are lost completely this could result in the removal of complete freight flows. Decisions by industries on which ports to use for imports or exports will impact freight flows and may give rise to new flows. Also new industries or changes in policy can give rise to completely new freight flows as well. For example changing energy policy has resulted in a decline in coal traffic but a massive increase in biomass flows to power stations. So a sound knowledge of where industry is heading in the future and likely impacts on freight demand is required to understand the consequential changes that may occur to freight flows as a result. Jaguar Land Rover at Halewood, for example, is a major freight generator in the Liverpool City Region that generates automotive trains bound for Southampton Docks with cars for export around the world. Unilever is another major freight generator with major flows from its factories to key ports etc.

Additionally, technology could change the way manufacturing is undertaken with resulting impacts for freight. For example, manufacturing might increasingly return to cities; 3D printing, or additive manufacturing, is a revolutionary technology that could lead to reduced transport of certain goods, which could be printed on site or closer to consumers. It is expected to transform the supply chain through localisation, reducing the need for mass-produced manufacturing, transportation and storage.

Rise of click and collect and other forms of internet shopping is also changing freight & logistics with a massive increase in vans and last mile deliveries in urban areas. Network Rail has invested £24m in the co-owned online shopping collection and returns business, Doddle, and plans to launch parcel shops at more than 300 stations. Customers can use the shops to collect and return parcels.

Looking to the future, skills and attracting the future workforce in freight will be essential. Perhaps there is a need to set up some kind of institution similar to the rail training colleges but for freight? The road haulage sector, for example, has an aging workforce so there is a need to futureproof the sector and attract the next generation.

Research and Innovation within the freight sector should also be encouraged and more links should be developed with institutions such as the Transport Systems Catapult and universities to foster innovation and knowledge transfer.

3. **What effects does congestion have on the efficiency of freight movement and emissions?**

   3.1. How does congestion impact upon the productivity and economic contribution of freight? To what extent does congestion affect changes to mode, time or other freight choices?

   3.2. How does congestion affect the environmental impacts of the movement of freight?

   3.3. With limited space for new infrastructure, how can we better use our existing urban network to support freight? Are there changes – such as changes to modes, methods, or delivery times - that could help reduce the stress on the urban transport network?

Congestion costs urban areas over £11bn each year, with the highest costs experienced during peak times of the day. Road freight (by far the dominant freight transport mode) contributes to, and suffers delays from, congestion on our urban road networks. Rail freight can also suffer from, and be the cause of, congestion on the rail network as freight trains use scarce network capacity and can get caught up in delays caused by passenger services. So it is likely that more capacity is needed to cope with increasing demand for passenger and freight on our transport networks. Many industries work on a "just in time" supply chain model and as a result any delays or congestion can be very detrimental for them and the wider economy.

4. **How can freight lower its carbon and air quality impacts?**

   4.1. Are there efficiencies within freight management and distribution practices that could help reduce the CO2 and NOx emissions from freight?

4.2. What role do alternative fuels such as electricity, Liquid Petroleum Gas and biofuels have to play? What are the barriers and challenges to wide-scale uptake of alternatives to diesel and what could be done to help remove these issues?

4.3. What technologies could best and most realistically be utilised to manage the carbon impacts of freight, both within urban areas and on longer strategic journeys?

With regard to Local Air Quality, carbon emissions are a mass balance of fuel consumption, so fuel savings will be beneficial for Greenhouse Gases, whereas NOX/NO2 emissions are more complex, and relate to a speed/emission profile that varies depending on the characteristics of the vehicle.

That said, there are definitely opportunities to reduce freight emissions. The Liverpool City Region is currently finalising the conclusion of an air quality study that will inform our decision on the introduction of measures to improve air quality in the City Region. The main tools that have been identified in that study are consolidation centres (both larger multi-modal distribution centres) and urban distribution centres. Opportunities for further efficiencies may be achieved by distribution plans that recognise air quality as one of the indices. For example, routing vehicles away from Air Quality Management Areas, and avoiding peak hour junctions.

Intelligent Transport Systems and links to junction management controls may also be used to manage instantaneous emissions and prioritise high-emitters (e.g. HGVs) to achieve more efficient drive cycles in sensitive areas.

Alternative fuels could also prove very useful, whether it comprises hybrid or zero-exhaust emission fuel. This is a very significant topic that needs to consider the incentives for adopting this technology, as well as the mechanism for implementing it, and better information on origin and destination is needed to extract this.

The use of technology should also be supported, and the use of technological options for reducing emissions may be best tacked through two streams. Firstly, additional technology, such as driver training, retrofit abatement, geofencing, UTMC and ITS should be used to increase vehicle efficiency. Secondly, opportunities for alternative fuel technology should be further developed. For example, EV may be ideal for urban environments but would likely need to link with intelligent distribution.

Further electrification of the rail network could also open up capacity – passenger trains will be able to travel faster, freeing up more space in the timetable for freight traffic. In addition, full electrification of the core freight network will allow more whole rail freight journeys to be electrically hauled, reducing the amount of diesel working ‘under the wires’ and bringing corresponding emissions benefits. On heavily graded routes, electrification can also help rail freight to be speeded up and better keep pace with the demands of an increasingly busy rail network. However partial electrification and bi-modes is a false economy and will not deliver this scale of benefits despite its short term cost savings. Bi-mode may be appropriate for short distances off the core freight network where electrification is not so cost effective. But the core freight network and core intercity passenger network should both be electrified fully so that the bulk of journeys are electric.

With the close proximity of the chemicals industry in Runcorn that produces hydrogen as a byproduct, the Liverpool City Region has potential to use hydrogen fuelcells as an alternative fuel. However potential is constrained by the lack of a sufficiently well-developed hydrogen refuelling network across the UK.

5. **How could new technologies be utilised to increase the efficiency and productivity of UK freight?**

   5.1. How will new technologies change the capacity and performance of the freight transport network? Over what timeframes might these new technologies begin to affect the freight transport network?

   5.2. How can the use of data such as real-time traffic information by artificial intelligence and machine learning systems help to improve freight efficiency and productivity? How might this affect the business models and requirements of freight in the future? Are there any barriers to the greater use of data in freight?

   5.3. How do you see technologies such as HGV platooning, digital railway signalling, and autonomous vehicles being integrated into freight distribution?

   5.4. How might regulations and physical infrastructure need to adapt to new technologies and business models in the freight sector?

Connected and autonomous vehicles could use road space more efficiently and increase the volume of traffic that can be accommodated. However, by offering more comfortable journeys and new travel opportunities, they are also likely to increase demand to use the road. This in turn will increase congestion on the road network. Modal shift from road to rail and water is part of the solution. While our road and rail networks have constrained capacity, the coastal waters around the UK are an untapped resource that can help relieve things.

Congestion and environmental pressures are leading to the development of alternative and more efficient logistics systems to reduce freight in city centres. Some of these last mile logistics solutions include electric cargo bikes, underground freight pipelines, delivery lockers at stations, and 'closed loop' systems where vehicles making inbound deliveries into the city pick up outbound recyclable waste for disposal and returns from retailers. Other reduction measures, such as consolidation centres, also aim to lessen the impact of freight movement in cities.

Despite the considerable benefits of rail and water transport, very little freight is moved in this way. The main requirements to achieve greater modal shift from road to rail are adequate paths for freight services to share the capacity of the rail network and the availability of a network of rail-connected distribution parks. The same is likely to be true for water freight – we need to ensure that our extensive network of waterways is equipped to deal with more vessels and that water-connected distribution parks are available. To enable more road freight to transfer onto rail and water, network capacity enhancements will be required.

Further electrification of the rail network could also open up capacity – passenger trains will be able to travel faster, freeing up more space in the timetable for freight traffic. In addition, electrification of the core freight network will allow more whole rail freight journeys to be electrically hauled, reducing the amount of diesel working 'under the wires' and bringing corresponding emissions benefits. On heavily graded routes, electrification can also help rail freight to be speeded up and better keep pace with the demands of an increasingly busy rail network. Bi-mode may be appropriate for short distances off the core freight network where electrification is not so cost effective. However, partial electrification and bi-modes is a false economy and will not deliver this scale of benefits despite its short term cost savings. The planning process for the passenger and other major rail projects should explore the potential to undertake simultaneous improvements to support rail freight. This could include, for example, gauge enhancements that allow trains to carry larger containers and the addition of passing loops to open up more opportunities for track sharing between freight and passenger services.

For long distance freight, the focus should be on increased rail freight which could make a real difference to congestion and pollution on some of the country's most overcrowded roads. Also, greater use of the UK's coastal waters which are an untapped resource could help relieve our congested land based networks. New technology and lorry platooning have potential but only work in certain limited scenarios so there may still be a need for new capacity to meet demand.

The Port of Liverpool is a major short sea shipping hub for the Irish Sea area with ro-ro ferry services to the Isle of Man, Dublin and Belfast (key operators including Stena Line, Seatruck Ferries, P&O Ferries and Isle of Man Steam Packet) and container feeder services to Dublin, Belfast, Cork and Glasgow and from English Channel Ports (including Southampton, Rotterdam, Antwerp and Le Havre) for example. More ports should develop similar short sea shipping networks for use as the default transport mode for certain destinations, this will enable the role of rail and road networks to be more focussed on where necessary or to add value.

Urban areas need to ensure that their planning policies seek to ensure that all major new distribution parks are rail (or water) connected and seek to ensure that 'last mile' deliveries are completed by low/zero emission modes where possible.

6**. Are there good examples internationally of freight systems, policy, infrastructure or technology development and implementation that the UK can learn from to increase freight efficiency and/or reduce the carbon and congestion impacts?**

According to the EU funded Cyclelogistics project (http://cyclelogistics.eu/), 51% of all deliveries in European cities could be made by bikes and cargo bikes, while research by the German Institute of Transport found that e-cargo bikes could take care of 85% of deliveries in Berlin. The main aim of Cyclelogistics is to reduce the CO2 emissions, urban air pollution, noise pollution and traffic from freight vehicles in urban areas by encouraging delivery companies to use smaller, near zero emission vehicles. This can also reduce costs. In the Netherlands, global delivery firm DHL has replaced 33 delivery vans with 33 cargo bikes, saving around 152 tonnes of CO2 and £340,000 per year.

Good industry standards, and enforcement of these standards, are the foundation for safe, clean and effective freight operations. Whilst many operators are committed to maintaining high standards and undergoing continuous improvement, there are currently no national schemes to help operators comply with – and go beyond – the numerous regulations and standards governing the industry.

There are a number of vehicle and fleet recognition schemes and standards already in operation across the country. The focus of these schemes varies. Some, for example, centre primarily on safe operations, others on improving environmental performance. There may be merit in mapping existing recognition schemes and standards in order to identify the potential for simplification, without compromising the ability of particular areas and sections of the industry to implement standards that best fit their requirements and goals. Consideration could also be given as to how more fleet operators could be encouraged to sign up to schemes and standards.

Examples include:

Fleet Operator Recognition Scheme (FORS): was introduced by Transport for London (TfL) in 2008 with the aim of making the capital's roads safer, cleaner and less congested. Participants in the scheme can apply for Bronze, Silver or Gold accreditation, with progression dependent on the fulfilment of a range of criteria covering management, vehicles, drivers, emissions, safety and operations. The framework has since been taken up by the Tyne and Wear Freight Partnership. In 2015, TfL appointed a concessionaire to run and develop the scheme nationally.

ECO Stars: was initially established by the four constituent local authorities in South Yorkshire in response to the need to improve ambient air quality across the region. The scheme provides guidance and recognition to operators seeking to improve efficiency and reduce fuel consumption and emissions.

CLOCS (Construction Logistics and Cyclist Safety): developed by the construction logistics industry, this programme of work includes a 'Standard for construction logistics: Managing work related road risk' that is implemented by construction clients through contracts. It brought together eleven existing standards, codes of practice and policies relating to work related road safety into a single common standard with a particular focus on cyclist safety.

Logistics Carbon Reduction Scheme: an industry-led initiative backed by the Freight Transport Association and aimed at reducing carbon emissions from road freight by recording and reporting reductions in CO2. Members are collectively committed to reducing the carbon intensity of their freight operations.

National Infrastructure Commission Freight Study: Call for Evidence

About ABP

ABP is the UK's leading ports operator, with a network of 21 ports around the country handling 92 million tonnes of cargo every year. Our ports are an integral part of supply chains across the country and serve as vital international gateways to British businesses. Together with our customers, ABP handles £150 billion worth of trade including £70 billion of exports[1]. Our ports include the Port of Southampton, the UK's number one export port and home to the UK's second largest container terminal, and the Port of Immingham, the UK's largest port by tonnage. By facilitating trade and supporting industry and manufacturing our ports make a major contribution to the UK economy, generating £7.5 billion and supporting 119,000 jobs.

ABP's operates port facilities in Ayr, Barrow, Barry, Cardiff, Fleetwood, Garston, Goole, Grimsby, Hull, Immingham, Ipswich, King's Lynn, Lowestoft, Newport, Plymouth, Port Talbot, Silloth, Southampton, Swansea, Teignmouth and Troon. ABP also operates Hams Hall rail freight terminal in the Midlands.

What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?

The key constraints to the effective movement of freight in the UK relate to the infrastructure required to meet changing freight patterns. The last 40 years have seen significant change in the freight sector, which has placed increasing constraints on the nation's infrastructure. The most significant development in the freight industry has been the widespread unitisation of cargo. Containerisation, in particular, has been adopted by many freight and cargo handlers with the result that increased ship sizes have been a constant feature of the maritime industry. The increase in the size of deep sea container vessels has more than doubled in the last decade to 22,000 TEUs (twenty-foot equivalent unit), putting pressure on ports and the wider supply chain to cope with increased volumes.

During the growth in container volumes the industry introduced larger containers (especially 9ft 6in high container) which at first could only be handled on rail with the introduction of low profile box

[1] MDS Transmodal: Value of goods through UK ports (2016)

rail wagons. A fleet of just 60 of these wagons were introduced by Freightliner. It was not until investment was made by Railtrack/Network Rail to increase loading gauge to W10 on the principal routes from Felixstowe and Southampton that there was a really significant transfer of road to rail movements with deep sea containers. Investment in W10 gauge clearance on the Southampton-Midlands mainline in 2012 resulted in a 25% increase in modal transfer of containers moving by rail from road. This investment created additional rail capacity into the Port of Southampton which allowed more cars for export to be shipped through the port from the Midlands and the North West.

However, there has been a failure to ensure that all ports significantly involved in the container trade have the rail connectivity they require. This is restricting the potential of some ports and their container line customers to see the transfer of containers from road to rail.

Currently, ABP is investing £15m in expanding Hull Container Terminal, which is primarily focussed on serving the short sea container lines operating between the Humber and Northern Europe and Scandinavia. Samskip, one of the largest European shipping and transport companies, has announced that it will add three sailings a week to Amsterdam from Hull, in addition to their five sailings a week to Rotterdam. All of the 100,000 containers handled through the Port of Hull are trucked along the heavily congested A63 Castle Street, the main thoroughfare through the City of Hull. Companies such as Siemens, Smith & Nephew, INEOS, R&B and ABP, who have invested more than £1 billion in new facilities over the last 3 years, are all located within close proximity to this increasingly problematic route.

Hull City Council have been pressing for a solution to this problem for some time. While there are now plans to upgrade Castle Street, such plans have a history of being delayed while port and commuter traffic continue to compete for limited space. Furthermore, the current proposal for the route is insufficient and will not be in place until 2024. Increasing congestion on the route will inevitably hold back trade and inhibit economic growth in the area. Providing road infrastructure to support the Port of Hull and other companies operating in a city which has one of the fastest records of employment growth in the UK, must be seen as essential.

Over the next 2 years ABP plans to invest more than £10m in expanding its Container Terminal in Immingham which is currently handling more than 225,000 containers a year. At present these containers are unable to move by rail due to the inadequate rail loading gauge connecting the port. We therefore welcome the Government's announcement of investment in the line and would recommend that this project is fast-tracked to ensure the fastest possible realisation of the benefits of this modal shift. The example of the success of investment in Southampton in increasing rail loading gauge to W10 clearly shows that when rail track infrastructure is provided to meet the needs of the freight industry the industry supports the investment by the volume of freight trade attracted.

An area that could provide high gain at low cost is upgrading rail gauge capacity for freight across the North, particularly on the Trans-Pennine route. A report by IPPR North has shown that upgrading and standardising the gauge of the existing East-West rail corridor could be achieved at cost of approximately £100 million[2]. Upgrading the gauge across the East-West corridor would develop the capability of the line, increasing the size of containers that could be carried.

Other issues relating to port connectivity persist. Road connectivity to the Port of Southampton, for example, is at times causing peak hour delays that could impact on manufacturers' supply chains. Ensuring that funding is made available to Southampton City Council and Highways England for the ongoing maintenance of roads leading to the port is essential to the continued free flow of freight to and from the port. Additional capacity to ensure that our transport infrastructure can accommodate the predicted increase in trade to Southampton, particularly the M27 and the A34 strategic routes, is also vital given the port's role as UK's leading export port.

The single biggest omission in UK freight infrastructure today is that it lacks the capability to move road trailers by rail. By providing the appropriate rail infrastructure to permit road trailers to be carried by rail, ports like Immingham and Hull would be transformed in their rail use which would have an enormous positive impact on modal transfer and relieve the pressure for ever more road infrastructure investment.

Finally, there is currently no assessment of the impact of trade (imports and exports) in the appraisal methodology used in the UK when assessing the potential use of public capital on infrastructure projects. Therefore, there is also no strategic prioritisation awarded to different projects based on their ability to support multiple policy objectives in addition to transport, such export-led economic growth. The impact on infrastructure of the cost of trade needs to be incorporated into the appraisal methodology. (See attached)

[2] IPPR North: A Northern Ports Strategy (2016)

2. How might the demand for freight develop and change over the next 20-30 years?

As much as containerisation has changed the physical handling and carriage of freight, information technology and digitalisation is having the same radical effect on consumer habits with the result we can envisage the continuing decline of traditional high street retailing as 'on line' purchasing becomes the norm.

So where we experienced growth from the 1970's to 2000 in out of town retailing centres we now see this trend replaced by the growth in out of town mega warehouse facilities, as on line retailing and companies like Amazon disrupt and transform consumer buying habits. In terms of manufacturing the advent of 3D printing, robotics and automation will all have an impact on the import and export of UK products.

Major deep sea shipping lines are investing heavily in blockchain technology to permit their customers and all those involved in the supply chain to access a more complete and transparent picture of the movement of their freight - this will identify the blockages in the movement of freight that need to be addressed to ensure more seamless flows. The introduction of this technology will cascade down and throughout the entire global freight community over the next 20 years and will play a major factor in future supply chain decisions. As the UK population is expected to grow to 70 million people within this timescale then consumer demand will continue to grow.

ABP has seen considerable change in the freight sector over the last decade, driven in part by Government policy on energy production which has resulted in a sharp decline in coal volumes. This trend has been mirrored by an increased involvement in the renewable energy sector. On the Humber, where the decline in coal volumes was most dramatically felt, ABP invested £150 million in world leading biomass import facilities which are now capable of handling over 6 million tonnes of product for nearby Drax power station. Biomass is transported to Drax by rail, helping to mitigate some of the decline in coal volumes for the rail industry. Other ports have seen nearly annual increases in container, RoRo trailer and automotive trades, and a continuing presence, and in some cases growth, in the handling of bulk agricultural and construction products.

A recent study by Edge Economics (attached) highlights the role ABP ports play in supporting the manufacturing and commodity sectors, in particular in the Midlands, Wales and in the North. It illustrates the huge economic value of ports to recently established Combined Authority and Local

Enterprise Partnership areas. The three sectors considered by the study – automotive; chemicals, pharmaceuticals, oil and petroleum; and food and beverages – are important employers across the UK. As major importers and exporters, these sectors also rely on the nation's ports as gateways to global markets. It is because of this essential role in the supply chain that the Port of Southampton supports 11,700 jobs in the automotive sector in the West Midlands; it's why our ports on the Humber support 5,700 jobs in chemicals, pharmaceuticals, oil and petroleum in West Yorkshire and 12,500 jobs in the food and beverages sector in Greater Lincolnshire

We foresee a continuation in growth in the overall volume of cargo freight handled by our range of ports over the next 20-30 years. Southampton, which predominantly serves global markets, is adapting to the challenge of continued growth across three major trades - cruise, car exports and deep sea container services. Our South Wales ports are currently benefitting from a more secure future for steel, improved road motorway connectivity, and other factors which encourage inward investment into the region. The ports in South Wales also present significant opportunities for inward investment in their own right. Our Northern ports are key instruments to the success of the Northern Powerhouse economic growth strategy, both as vital international trading gateways and hubs for local manufacturing and industrial activity.

Transport for the North has developed a Strategic Transport Plan highlighting northern transport corridors to transform the North's economic development, creating 800,000 additional jobs by 2050. The Transpennine corridor is earmarked for priority, with its flagship 'Northern Powerhouse Rail' project running from the Humber to the North West coast. As the country's busiest trading estuary and home to UK's largest port, it is essential that the Humber has the freight transport infrastructure tools to play their role in the success and vision of this project.

Finally, the role of smaller ports should be recognised as the demise of local ports can have a devastating effect on the local communities and reduce freight choice options. Ensuring viable road and rail connections to these ports can play an important role in securing their continued operation and provide a boost to regional development. Funding initiatives such as the Coastal Regional Development Fund, Local Growth Funds could be adapted to support infrastructure improvements in these areas.

3. What effects does congestion have on the efficiency of freight movement and emissions?

Congestion increases the costs of supply/distribution and consequently increases emissions in the short term. This point is best illustrated by the example, given above, of the A63 connecting to the Port of Hull where a lack of investment in road infrastructure has resulted in considerable congestion and disruption to the flow and growth of trade. The slowing down or blockage of freight traffic around such bottlenecks also results in a concentration of the related emissions. In the longer term such blockage points can influence the location of industrial activity and warehousing and logistic activities and therefore hinder economic growth.

Congestion has a similarly negative impact on rail freight. Companies such as Drax, who are dependent on rail to transport their biomass from Immingham and Hull, are particularly impacted when the rail services they use are subject to delay as a result of passenger trains taking priority on the rail network. This impediment to the efficient flow of rail freight results in congestion which can result in emissions build ups.

4. How can freight lower its carbon and air quality impacts?

The most effective way reducing the environmental impact of freight transportation is through modal shift from road to rail. Investment in the rail gauge enhancement referenced above is a pre-requisite to the necessary and sustainable increase in rail freight to and from the nation's major ports. Examples of successful policies to encourage this shift in the ports industry have been outlined above.

An often overlooked sustainable transport mode is canal barge, where there is still potential for freight to move by barge on the UK's waterways. ABP is working with the Canal and Rivers Trust to look to improve the Aire and Calder Canal to permit Euro Class 1 barges (capacity to transport 600 tonnes of cargo per barge) to operate from the Port of Goole (the UK's most inland port) to Leeds.

There are particular flows of trade, including aggregates and construction materials, which can be viably handled by barge provided the capacity of the barges provides economies of scale. The advantages of improving capability and capacity in inland waterways is that the capital investment is comparatively modest to some road and rail schemes. The improvement to the Aire and Calder Canal is one the freight objectives included in Transport for the North's 2016 Freight Strategy Document.

5. How could new technologies be utilised to increase the efficiency and productivity of UK freight?

In the coming years, technological advances are set to change the nature of global trade and transport dramatically. On the landside this is evident in the introduction of electric vehicles or automation in quayside cargo handling. On the marine side the past few years have seen innovators like Rolls-Royce take major steps forward in the journey towards making autonomous shipping a tangible reality, not least with the successful delivery of the world's first remote-controlled commercial vessel. Such advances exemplify the current trends in technology and innovation that are set to have a transformative effect on our sector. At ABP we are working to ensure we fully understand the regulatory implications and the business potential of these trends. We are also investing to ensure we are well placed to embrace the opportunities in efficiency presented by developing technologies.

6. Are there good examples internationally of freight systems, policy, infrastructure or technology development and implementation that the UK can learn from to increase freight efficiency and/or reduce the carbon and congestion impacts?

Many European ports benefit from an integrated approach to the provision of road, rail and canal waterway infrastructure. The inability of UK rail infrastructure to transport road trailers is a considerable omission and constraint on modal switch. Shipping lines and freight carriers who operate across multiple modes across Europe, often struggle on the UK side where road is often the only viable option. On the Continent the transport by rail of road trailers is common and provides an efficient and environmental solution to the movement of road trailers. The introduction of 'piggyback rail wagons' capable of carrying road trailers would have the single largest impact in securing the transfer of freight from road to rail. This technology has already been proven in the UK when it was trialled in the early 1990's to encourage Channel Tunnel freight.

The development of this wagon technology in tandem with clearing rail loading gauges on main rail trunk routes would bring considerable benefits. As the freight industry seeks synergies to enhance freight transportation it is clear that certain limitations in UK infrastructure are holding the industry back, both in terms of its potential efficiency and in the reduction of carbon emissions.

British Ports Association

5 March 2018

National Infrastructure Commission
5th Floor
11 Philpot Lane
London
EC3M 8UD

Email to: Freightstudy@nic.gsi.gov.uk

Consultation on the National Infrastructure Commission's Freight Study – submission by the British Ports Association

Thank you for the opportunity to comment. This response is made on behalf of the British Ports Association (BPA) which represents in excess of 350 ports and harbour facilities and terminals of all sizes across the UK. Ports are vital components of the UK economy, acting as gateways for 95% of the UK's international trade, as well as providing regional hubs for economic activity and employment.

We did respond to the NIC's interim Infrastructure Assessment consultation earlier this year and we have used some of our responses in the answers to this exercise as we feel they are equally relevant.

Summary of main points:-

- Ports are financially and strategically independent and port investments are market-led but need a good hinterland transport network to handle the trade they facilitate
- The quality of the transport network is critical for efficient freight movement and business growth
- Support for the transport network should be backed up by clearer public funding commitments
- Road funding has been neglected in the last two decades
- Efficient planning and consenting regimes are vital – changes for ports are important and post Brexit there will be opportunities
- Last mile connections and bottlenecks around ports must be examined and solutions prioritised for both the Strategic Road Network and the revived Major Road Network
- New arrangements are needed whereby information about port connectivity needs can be regularly fed into the planning process
- Freight needs greater recognition in Government policy and a new Freight Strategy Review has been a clear ask of the ports sector for some time

UK ports are predominantly privately owned and commercially managed, operating strategically and financially independent of government. There are a diverse range of ports operating in the UK, with some handling cargoes themselves, while other port authorities play a landlord role and simply fulfil maritime, pilotage and conservancy functions leaving terminals and others to oversee cargo operations. With very few exceptions the vast majority of UK port infrastructure investments are privately financed. Port investments are market-led and at present we estimate that somewhere in the region of £1.7bn worth of port projects will be undertaken in the next few years.

Our response to the individual questions in the call:

1. **What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?**

   In terms of infrastructure, ports ask for very little from the Government but they do rely on a stable economic and policy framework, an efficient planning system and, of particular relevance to this consultation, a modern transport infrastructure. The latter area is subject to sometimes competing demands, for example between passenger and freight-based projects, and especially budget constraints. In terms of obstacles, the central and fundamental issue is funding of infrastructure. As already noted we would support improving infrastructure, but delivery is sometimes slow and it can be the case that passenger priorities dominate freight. There is a clearly not a sufficient freight policy strategy on the Government's part.

1.1. What do you see as the key drivers to a successful freight system that is fit for the future?

The BPA has called for a new UK freight strategy and we have also pressed the Government to prioritise freight transport infrastructure and particular challenges such as 'last mile' connections to ports. The Department for Transport is also currently undertaking Port Connectivity Study, the results of which should be known shortly. It will be important that this forthcoming Study on connectivity is backed up with investment and that ports feature when spending decisions are made on, for example, future rounds of the Road Investment Strategy (RIS) and rail investment decisions.

Roads are essential for ports and freight and it will be important that Government does not concentrate its freight policies only on rail schemes. We also have a wide variety of smaller cargo handling ports and terminals so it will be important to build in port connectivity provisions that cover all ports to ensure all regions and activities are catered for under RIS and not neglected.

1.2. Which are the key freight corridors that matter the most? Where are the bottlenecks in the freight network, and what investments in upgrades could deliver the best value for money for freight efficiency and UK plc?

As a national association with arrange of members across the country we take no view on specific routes.

1.3. To what extent are the economic benefits of freight factored into wider transport infrastructure investment planning?

a: 1st Floor, 30 Park Street, London SE1 9EQ **t:** +44 207 260 1780 **f:** +44 20 3598 1732
e: info@britishports.org.uk **w:** www.britishports.org.uk

An important consideration on public infrastructure funding decisions are the cost benefit ratios for investment. Although produced some time ago, one of the conclusions of the Eddington Report commissioned by the DfT in 2006 is, we believe, still very relevant in that it identified strong cost benefit ratios for investment in access to ports which they assessed translated into positive GDP benefits and represented good value for money. We have suggested previously that perhaps policy makers need to be reminded of these findings?

According to an estimate conducted for the BPA by MDS Transmodal in 2015, between 80-85% of landside UK port freight enters and leaves ports by road. This is a consequence of our geography, an import and services led economy and the UK's proximity to major European freight hubs. Ports rely on good hinterland connections but in recent years much of the public investment in transport has been allocated to big ticket passenger schemes instead of freight projects.

This means road investment should be prioritised. The recent NIC interim Infrastructure Assessment suggested that poor connectivity and congestion has had a negative impact on UK logistics costs. The document also highlights that the majority of freight is transported by road. It states that in the last 50 years total volumes of rail freight have remained broadly constant, while volumes on the road have doubled, vastly outpacing public road investment. This briefly captured in the Department for Transport's Road Investment Strategy 2 (RIS2) Initial Report but more needs to be made of freight issues and port connectivity challenges, particularly in respect of 'last mile connections', which are often outside but linked to the Strategic Road Network.

1.4. What are the regulatory and legal issues that, if changed, could improve freight efficiency without increasing costs or reducing efficiency?

The consenting and planning regimes can often limit port develop. As the UK prepares for Brexit the Government must examine options for the speeding up of decisions in port areas and possibly zoning ports off to allow certain preferential planning arrangements.

2. How might the demand for freight develop and change over the next 20-30 years?

We expect to see further increases in unitised trade, changes to energy consumption usages and it is not fully understood as to what the likely impact of Brexit will have on the UK economy and port traffic. Also the DfT is developing a Port Sector Forecasting tool to predict at high level general trade trends, which could be useful to the NIC.

2.1. How has the demand for freight, and types of freight, changed over the last two decades, and what will be the drivers for changes in the future?

There has been a steady shift to unitised trade on Ro-Ro and Lo-Lo over this time and this is expected to continue. With the reduction of coal freight, we have seen even more reliance on roads which is the natural mode for an island nation with the geography we have and proximity to major a continental market.

2.2. How is the freight industry planning for future changes in the demand? What levers might be available to shape future demand for freight transport?

Ports are considering a number of their own infrastructure developments and improvements with the freight industry but as ever these will be market-led and follow a solid business case.

3. What effects does congestion have on the efficiency of freight movement and emissions?

3.1. How does congestion impact upon the productivity and economic contribution of freight? To what extent does congestion affect changes to mode, time or other freight choices?

It is often the case for ports that although the main highway network is good, the links to it can be poor, and traffic can become gridlocked on the approaches - particularly in towns and cities.

3.2. How does congestion affect the environmental impacts of the movement of freight?

Delays to freight is a less efficient use of fuel and congestion contributes negatively to the surrounding environment.

3.3. With limited space for new infrastructure, how can we better use our existing urban network to support freight? Are there changes – such as changes to modes, methods, or delivery times - that could help reduce the stress on the urban transport network?

As mentioned earlier the nature of the freight industry is that it is largely facilitated by road which is set to continue. We have previously discussed with policy makers how in the future to avoid excessive road congestion in the UK, passenger transport schemes might be directed to public transport but this is a measure which would need to be fully reviewed in a high level transport and freight strategic review.

4. How can freight lower its carbon and air quality impacts?

4.1. Are there efficiencies within freight management and distribution practices that could help reduce the CO2 **and NOx emissions from freight?**

Although the overwhelming majority of freight arrives and leaves ports by road, rail can still play a significant role in facilitating lorry journeys and freight miles off roads. The lack of good rail connections and capacity issues in many areas is a constraint for regular freight traffic movement. More attention needs to be given to rail freight alongside the need to expand passenger capacity, especially connecting with previously unconnected and regionally active ports. Also smaller cargo handling ports and terminals have found it almost impossible to even pose rail connectivity suggestions.

Separately given the UK's geography and network of regionally spread ports, there remains real opportunities to move more freight by water, coastwise up and down the country and also, in certain locations, on inland waterways. We have been pushing Government for a re-think on its non-existent coastal shipping policy and review the water freight grants system to help sustain new operators in the way rail schemes have done, indefinitely.

4.2. What role do alternative fuels such as electricity, Liquid Petroleum Gas and biofuels have to play? What are the barriers and challenges to wide-scale uptake of alternatives to diesel and what could be done to help remove these issues?

In terms of HGVs and vans the usage of such fuels is a matter for the haulers but ports will look to make modifications where suitable. Elsewhere the usage and provision of new fuels in the maritime environment is heavily dependent upon market demand.

4.3. What technologies could best and most realistically be utilised to manage the carbon impacts of freight, both within urban areas and on longer strategic journeys?

The NIC's interim Assessment gave much attention to green challenges and reducing emissions which it challenges policy makers to tackle. Recent environmental policy decisions by Government has dramatically reduced the use of coal to fuel power stations meaning coal imports and rail freight movements have reduced subsequently. Greater renewable energy provision and future initiatives such as the pontooning of lorries could see further reliance of industry on the road network for freight transport.

We thank you for the opportunity to comment and we would be pleased to explore these issues further in person.

[Name redacted]
[Job title redacted]
British Ports Association

National Infrastructure Commission

Evidence sought on future of UK's freight infrastructure

Dear Sir/Madam

Railfuture is the UK's leading independent organisation campaigning for better rail services for passengers and freight. We are a voluntary group representing rail users, with 20,000 affiliated and individual members. We are not affiliated to or funded by train companies, political parties or trade unions, and we use one-member, one-vote democracy.

Members of our Freight Group have put together the following response to your questions, which we hope you will find helpful. Where we have no specific observations, we have not answered that particular question.

[Name redacted]
[Job title redacted], Railfuture Freight Group
www.railfuture.org.uk

1. What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?

Rail capacity is restricted by virtue of line closures, and also by various rationalisation programmes. For example, multiple tracks have been reduced, sometimes from quadruple to double track, or even to a single line. Many junctions have been reduced to single leads, even where the running lines are double, severely reducing capacity. These various reductions need to be progressively reversed as traffic demand increases.

More efficient junctions (e.g. double rather than single lead) are needed at locations such as Haughley Junction and Ely North in East Anglia, which restrict rail freight to/from the Port of Felixstowe. Some closed routes should be reopened - for example, Colne-Skipton and Buxton-Matlock for Trans-Pennine freight.

1.1. What do you see as the key drivers to a successful freight system that is fit for the future?

We believe that freight movement should be required to meet the full economic, social and environmental costs that it imposes on society. We do not believe that this is currently the case – for the largest HGVs, there is a shortfall by a wide margin.

1.2. Which are the key freight corridors that matter the most? Where are the bottlenecks in the freight network, and what investments in upgrades could deliver the best value for money for freight efficiency and UK plc?

For rail, with the demise of coal, the major corridors for freight will more closely align with trunk passenger routes. It is essential that freight is not squeezed out by passenger demands. Recent examples of this include suggestions that freight can be removed from the Midland Main Line to allow more passengers to Luton Airport, and the idea that unproven theoretical road freight platoons can replace rail freight.

With that in mind, the major freight corridors for rail include the West Coast, East Coast, Midland, and Great Western Main Lines, together with links to the ports and Channel Tunnel. Also of importance are:

Felixstowe to Birmingham via Ely
Peterborough to Doncaster via Spalding
Southampton to Birmingham via Oxford
East West Rail
North Trans Pennine

1.3. To what extent are the economic benefits of freight factored into wider transport infrastructure investment planning?

No specific observations.

1.4. What are the regulatory and legal issues that, if changed, could improve freight efficiency without increasing costs or reducing efficiency?

Given that we do not believe that road freight is currently meeting the full costs which it imposes, the starting point should not be that taxes on operators or users ought not to be increased.

Because of external costs, there is a distinction in economic terms between the lowest initial cost to the user, and the lowest overall cost to society (and thereby true economic efficiency).

Realistic taxation of HGVs, instead of the massive cross subsidy current provided to them by taxes paid by the private motorist, would have the effect of moving traffic from road to rail, reducing the need for costly road provision and maintenance.

2. How might the demand for freight develop and change over the next 20-30 years?

Even now, we are seeing the effect of online purchasing with the increase in small vans for local deliveries and hub and spoke road trunking. In future, the vans could well be electric powered, but the trunk operation needs to be based more around rail if the country is to have any hope of meeting CO_2 targets.

2.1. How has the demand for freight, and types of freight, changed over the last two decades, and what will be the drivers for changes in the future?

Demand for 2.9m / 9' 6" containers has increased substantially over the last 20 years. Barriers to these increasing are low bridges and the requirement for specialist wagons on other than the core routes.

Key rail routes in the UK need to be progressively cleared for European swapbodies – on cost grounds, probably not to the largest current UIC gauge, but perhaps initially to GB+ gauge.

Demand for container movement by rail is expected to increase significantly over the next 20 years.

Trainloads of bulk freight have changed in character. Coal traditionally has been the main traffic but has declined to almost nil. Aggregates traffic, on the other hand, is increasing – the average length of haul has increased as existing quarries are becoming life expired and new ones are being opened up.

Bulk traffic is moving greater distances due to the closure of older facilities like cement works, culminating in longer flows e.g. from Oxwellmains (near Dunbar) to Essex.

Logistics is the next big are of traffic growth for rail, with more next day/that day delivery being the norm. Faster freight that can keep up with passenger services in terms of speed will be required. Small consignments for several companies all on one train to reduce the use of small vans/LGVs and provide a more rational alternative to the proposed convoys of driverless HGVs that the Government is planning to introduce.

Internet retailing will increase the call for these services. To avoid increasing traffic pressures in urban areas, freight deliveries need to be regulated by the use of rail-served consolidation centres, with electric local delivery vehicles and bicycle delivery being a key part (the 'last mile').

2.2. How is the freight industry planning for future changes in the demand? What levers might be available to shape future demand for freight transport?

No specific observations.

3. What effects does congestion have on the efficiency of freight movement and emissions?

No specific observations.

3.1. How does congestion impact upon the productivity and economic contribution of freight? To what extent does congestion affect changes to mode, time or other freight choices?

No specific observations.

3.2. How does congestion affect the environmental impacts of the movement of freight?

No specific observations.

3.3. With limited space for new infrastructure, how can we better use our existing urban network to support freight? Are there changes – such as changes to modes, methods, or delivery times - that could help reduce the stress on the urban transport network?

'Last-mile' delivery increasing needs to be by road from a rail-served freight consolidation centre.

There should be a general resumption of the carriage of parcels and mail by train, as was widespread until the 1980s.

4. How can freight lower its carbon and air quality impacts?

By using more electric and or hybrid traction

Changes to road freight appear to amount to 'tinkering at the edges' of emissions reductions. By contrast, even without the benefits of electric haulage, every tonne of freight transferred from road to rail results in a 60%+ reduction in CO2 and noxious emissions.

There should be a 'rolling programme' of rail electrification taking in the following key routes:

Felixstowe to Birmingham via Ely
Peterborough to Doncaster via Spalding
Southampton to Birmingham via Oxford
East West Rail
North Trans Pennine
Midland Mainline

4.1. Are there efficiencies within freight management and distribution practices that could help reduce the CO2 and NOx emissions from freight?

Use of electrically-hauled freight trains for the longer journeys with final delivery using 'last mile' hybrid technology.

More use of the existing passenger train network to move small consignments between main centres of population, with secure areas being provided in carriages on those trains.

4.2. What role do alternative fuels such as electricity, Liquid Petroleum Gas and biofuels have to play? What are the barriers and challenges to wide-scale uptake of alternatives to diesel and what could be done to help remove these issues?

Whilst LPG is cleaner, it is still a fossil fuel, and the benefits in road use are still single-digit percentage improvements compared to a modal shift from road to rail. Widespread adoption of biofuel could have serious consequences for broader environmental sustainability. Electric propulsion is still complicated and, on a large scale, unproven for road use, but it is already working and proven on rail. With wind, solar and nuclear power generation, electric rail transport seems to offer an obvious solution.

Barriers to more use of electric rail haulage at present include the lack of any East-West electrified routes, except around London and between Edinburgh and Glasgow.

There is also an absence of small-scale, infill electrification schemes to allow the use of electric traction on other than the West and East Coast Main Lines.

The list of rail routes that need urgent electrification for freight, especially in light of comments made by Jo Johnson MP, Minister of State at the Department for Transport, regarding decarbonising of transport:

Felixstowe to Birmingham via Ely, Peterborough, Leicester, Nuneaton
Peterborough to Doncaster via Spalding
Kettering to Doncaster via Corby & Leicester, Derby, Toton, Chesterfield, Rotherham
Dore to Chinley/Buxton
Basingstoke to Nuneaton
Oxford to Cambridge for Felixstowe flows
Liverpool-York via Huddersfield and via Bamber Bridge (Preston) - Burnley to Skipton.

4.3. What technologies could best and most realistically be utilised to manage the carbon impacts of freight, both within urban areas and on longer strategic journeys?

The introduction of distance-based, electronic road user charging is overdue. This would provide a way of ensuring that road users (particularly the largest and heaviest vehicles) met their full economic, social and environmental costs. It would also provide a revenue source for the Treasury, to offset the inevitable reduction in receipts from fuel tax that will occur as fossil fuel use declines.

A distance-based, rather than time-based, charging system would avoid penalising those who have to use their vehicles for short, mainly urban journeys (such as building tradespeople).

5. How could new technologies be utilised to increase the efficiency and productivity of UK freight?

No specific observations.

5.1. How will new technologies change the capacity and performance of the freight transport network? Over what timeframes might these new technologies begin to affect the freight transport network?

No specific observations.

5.2. How can the use of data such as real-time traffic information by artificial intelligence and machine learning systems help to improve freight efficiency and productivity? How might this affect the business models and requirements of freight in the future? Are there any barriers to the greater use of data in freight?

No specific observations.

5.3. How do you see technologies such as HGV platooning, digital railway signalling, and autonomous vehicles being integrated into freight distribution?

We see HGV platooning as a 'red herring' – a solution looking for a problem. It has the unique (dis)advantage of combining the worst of road with the worst of rail. Platoon assembly will be akin to marshalling a train with a number of vehicles needing to go to the same destination, ideal rail territory. Additionally, this new "train" will still have the fuel use inefficiency of road vehicles, and generate the pollutants collectively known as the 'Oslo effect'. There is also likely to be a need for a dedicated highway if major accidents with other road users are to be avoided. It is not clear why public money should be allocated to such projects as compared with securing the wide-ranging benefits of a modal switch from road to rail.

5.4. How might regulations and physical infrastructure need to adapt to new technologies and business models in the freight sector?

There is a need for more rail freight terminals and rail-served Freight Consolidation Centres on the edges of major conurbations. These have been notoriously problematic when it comes to securing sites and obtaining planning permission. Without such sites, however, traffic cannot be moved by rail.

Government needs to be proactive in identifying such sites at a regional and sub-regional level, rather than leaving it up to developers and operators to negotiate the pitfalls of the town planning system.

There is also a need for rail terminals within urban areas to handle mail and parcels – a type of facility that was widespread until the 1980s but where suitable land has too often been sold off for development.

6. Are there good examples internationally of freight systems, policy, infrastructure or technology development and implementation that the UK can learn from to increase freight efficiency and/or reduce the carbon and congestion impacts?

Most countries worldwide make far more use of their rail networks for freight than does the UK, helping to reduce carbon, noxious air quality and congestion in one, proven, package.

TEES VALLEY COMBINED AUTHORITY

To: Freightstudy@nic.gsi.gov.uk

National Infrastructure Commission

Freight Study Call for Evidence

January 2018

Contact for any queries/comments regarding this response:

[Name redacted]
[Job title redacted]
[Email address redacted]
[Telephone number redacted]

About Tees Valley Combined Authority

Tees Valley Combined Authority (TVCA) was created in April 2016 to drive economic growth and job creation in the area. It harnesses the economy-boosting powers of Tees Valley's five local councils (Darlington, Hartlepool, Middlesbrough, Redcar and Cleveland and Stockton) and Tees Valley Local Enterprise Partnership (Tees Valley Unlimited) to elevate partnership working between the public and private sectors to a new level in order to create an even more effective approach to building a stronger Tees Valley.

Tees Valley Combined Authority (TVCA) welcomes the opportunity to respond to the National Infrastructure Commission's call for evidence. Our response to the questions posed by the Commission is attached and we would be happy to provide further information or to answer any additional questions you may have.

Responses to Questions:

1. **What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?**
   - **Capacit**y - the need to minimise congestion on key freight routes
   - **Capability** – the need to provide sites that are well-connected by road and rail networks that are fit-for-purpose and can accommodate key freight flows
   - **Resilience** – the need to provide alternatives where freight needs to be diverted
   - **Skills** – the need to provide an appropriately skilled workforce

- **Technology** – the need for the sector, including at SME level, to embrace new technology to provide cleaner freight movements and more automated processes

  A 2017 survey by Regeneris of local logistics firms in the Tees Valley found that 66% of respondents viewed the Tees Valley either strongly positively or positively as a place to live, work and do business and that key strengths included the workforce, business accommodation, business support provision, and quality of life. However, the most cited significant barriers to business performance and efficiency were identified by respondents as:
- Availability of skills (34%)
- Access to new markets or supply chains (24%)
- Adequacy of transport infrastructure (24%)
- Availability of suitable sites and premises (24%)

1.1. What do you see as the key drivers to a successful freight system that is fit for the future?

The two key drivers that are certain are technology, including greater automation of all processes throughout the supply chain, and the need to 'green' freight. These in turn will be driven by the marketplace and regulation.

Technology
Consumers' shopping habits and expectations are changing. The growth of online shopping and growing expectations around same-day / next day delivery are presenting new challenges for distribution lead times particular as later cut-off times squeeze the time between order and delivery.

Coupled with continuing price competition and low margins, this squeeze makes technology including the growth of digitalisation and more autonomous systems, increasingly important. Analysis by Tachnavio suggests the three most important market trends that will impact on the European rail freight market between 2017-2021 will be related to technology: use of big data analytics to optimise performance, GPS real-time tracking of individual freight consignments and telematics delivering the realtime status of individual wagons.

Green Agenda
A report by the Royal College of Physicians concluded: 'Each year in the UK the equivalent of around 40,000 deaths can be attributed to outdoor air pollution linked to exposure to fine particulates and NO2 [nitrogen dioxide].' Under the **Climate Change Act**, the UK government is legally required to make a 57% reduction in emissions by 2032 and by 80% by 2050 compared to 1990 levels. As HGVs are responsible for a disproportionately high percentage of total UK surface transport emissions, and carry most of our freight, a continued push towards greener road freight in particular is to be expected. The DHL Group has already committed to reducing all logistics-related emissions to zero by 2050, in line with the targets agreed in Paris. Again, technology will play a large part in this agenda as demand increases for more fuel-efficient, lower emission freight transport modes.

1.2. Which are the key freight corridors that matter the most? Where are the bottlenecks in the freight network, and what investments in upgrades could deliver the best value for money for freight efficiency and UK plc?

The two busiest sections of the Tees Valley road network, for HGVs and other vehicles, are the A19 Tees Viaduct and the A66 east of the A19 Viaduct. Local Trafficmaster data shows that lorries on routes between Teesport / the Wilton International petro-chemical complex and the A19 / A689 interchange at Wolviston are experiencing between 30-40 seconds of delay for every kilometre travelled at the AM and PM peaks.

Beyond the Tees Valley Network, other key congestion points highlighted by our local HGV operators are:

- A66 trans-Pennine (where HGVs account for over 20% of traffic)
- A1 Newcastle and Gateshead Western Bypass
- M62 trans-Pennine

In terms of road freight, investment in the above strategic routes would currently have the greatest impact for our road hauliers who are largely operating up to Scotland, down to the Midlands and across to the North West.

Congestion at southern ports has also been well-documented over a number of years, resulting in delays and higher inland transport costs for shippers. Northern ports could play a far bigger role in handling UK imports and exports, thereby releasing congestion from the south.

Rail could also play a much greater role in inland distribution, offering an alternative to longer road journeys on congested routes as well as other potential benefits in terms of both cost and the environment. Rail is significantly constrained by a lack of capacity (paths) and capability (ability to accommodate longer, heavier, wider or higher trains), particularly on trans-Pennine routes. Upgrades of key routes for freight are required so we can move the rail freight offer closer to parity with the road freight offer, particularly for more time-sensitive freight, e.g. intermodal and Fast Moving Consumer Goods (FMCG).

1.3. To what extent are the economic benefits of freight factored into wider transport infrastructure investment planning?

There are approximately 16,500 people employed in the Tees Valley logistics sector, across 825 businesses representing a total GVA of £533m.The Tees Valley Combined Authority, Transport for the North and other combined authority partners fully recognise the role of freight as an enabling sector which underpins the health of other sectors such as energy, retail and construction and can act as a barometer of more general economic wellbeing. The Tees Valley Combined Authority has also deemed logistics to be a priority sector in its own right for investment, jobs and infrastructure planning owing to the scale of operations and availability of some key strategic assets:

- Deepest port facilities on the east coast with open access to the sea

- Daily rail and sea connections for shipping containers
- Major industrial cluster and strong supply base for exports
- Enterprise Zones and good availability of brownfield sites
- Competitive rates for land, warehousing and road haulage
- Relatively uncongested roads and economic centres
- A local airport with proximity to main freight sites
- Extensive pipeline network for liquid bulk movements
- Half the UK population within 4.5 hours drive for a HGV

1.4. What are the regulatory and legal issues that, if changed, could improve freight efficiency without increasing costs or reducing efficiency?

No response

2. **How might the demand for freight develop and change over the next 20-30 years?**

As above, one of the primary drivers will be market demand, particularly key sectors such as Fast Moving Consumer Goods, Energy, Automotive and Construction. Freight operators will increasingly have to provide complete door-to-door traceability of consignments, monitoring every mile and every interchange, offer full reporting of the environmental impact of a consignment's journey. Together with regulation, this will drive the greening and of digitalisation of the freight journey. At the same time, as customers demand increasingly shorter delivery times, this will lead to a greater need for offsite consolidation closer to the end user(s) and faster, more resilient transport modes. How and where freight moves will also be influenced by the UK's departure from the European Union.

2.1. How has the demand for freight, and types of freight, changed over the last two decades, and what will be the drivers for changes in the future?

The decline of North Sea volumes though our ports has been significant as have other changes to the energy market. In particular, the rail freight sector has been significantly impacted by the demise of coal-fired power stations and the rise of biomass and waste as alternative energy supplies. Whereas rail has historically been dominated by slow-moving, bulk movements between industrial sidings, we are seeing a greater shift towards rail services that are more time-sensitive and more likely to run along routes that compete more directly with passenger services for capacity. Also, in the case of FMCG, there will be greater demand for rail-connected warehousing near to centres of population.

2.2. How is the freight industry planning for future changes in the demand? What levers might be available to shape future demand for freight transport?

As above, largely determined by technology and to some extent, regulation.

3. **What effects does congestion have on the efficiency of freight movement and emissions?**

The two busiest sections of the Tees Valley road network for HGVs and other vehicles are the A19 Tees Viaduct and the A66 east of the A19 Viaduct. Lorries on routes between the Teesport / Wilton International area and the A19 / A689 interchange at Wolviston are experiencing between 30-40 seconds of delay for every kilometre travelled at the AM and PM peaks.

3.1. How does congestion impact upon the productivity and economic contribution of freight? To what extent does congestion affect changes to mode, time or other freight choices?

The FTA has estimated that it costs an operator of a 44 tonne HGV £1 for every minute of delay on congested roads. As well as the impact on direct operating costs, there is also an impact on vehicle utilisation where delay impacts on an operator's ability to complete round trips within a given time. In November 2015, the average delay on the Strategic Route Network in England was 9.4 seconds per vehicle mile.

In many cases, there is little choice than to move freight by road so it is imperative that we can offer key freight routes that have minimal congestion and optimum resilience. Where there is scope to transfer more goods to rail, we need to ensure that key rail routes also offer capacity, resilience and the capability to accommodate traffic as appropriate, e.g. suitable gauge clearance for key intermodal corridors.

3.2. How does congestion affect the environmental impacts of the movement of freight?

An articulated lorry over 33t gross will average 8 miles to the gallon and leave a carbon footprint of just under a kilogram of CO^2 for each kilometre travelled (933.65g/km). This means that for the 129km average haul undertaken by Tees Valley-based HGVs, 120kg of CO^2 will be produced. The more idling and stop-start traffic due to congestion, the more fuel is used with a direct impact on both carbon and emissions.

A report prepared for Transport for the North also estimated that for non-freight users road freight imposes average costs of around £0.30 per HGV kilometre on in terms of CO^2 and NOx emissions, congestion, accidents, road pavement damage and noise. As stopping and idling adds to fuel consumption this compounds the negative environmental impact further as the level of emissions correlates to fuel usage.

3.3. With limited space for new infrastructure, how can we better use our existing urban network to support freight? Are there changes – such as changes to modes, methods, or delivery times - that could help reduce the stress on the urban transport network?

In some cases, the greater use of out-of-town / off-site consolidation facilities can be useful in accommodating alternatives methods of delivery including greater use of alternative, quieter and cleaner modes of transport and deliveries permitted over a longer time period. Such measures can also reduce the number of vehicles. Darlington has a successful model of last mile cargo cycle deliveries within the town centre using a small consolidation facility just outside of the town where vans can drop and go, leaving cycle couriers to deliver within the town itself. This sort of model, particularly when also using low emission, quiet vehicles could be rolled out relatively easily elsewhere. A consolidation point might be nothing more than a secure storage container.

Improvements to existing infrastructure which reduces the amount of stop-start traffic could alsoimpact significantly on carbon and air quality in some areas, together with the use of Variable Messaging Systems at key points on main freight routes around towns and cities to alert HGV drivers to traffic congestion.

4. **How can freight lower its carbon and air quality impacts?**

In terms of last-mile logistics, the greater use of green options such as electric vehicles and cycles could have a much greater impact. For longer journeys, road haulage is vitally important to the movement of goods but the carbon and air quality of impact of freight could be reduced if we could secure a shift, where appropriate, to other modes, particularly rail but also coastal shipping and pipeline.

According to the DfT's 2016 Rail Freight Strategy, "…each tonne of freight transported by rail reduces carbon emissions by 76 per cent compared to road and each freight train removes 43 to 76 lorries from the roads" See also Keeping the Lights on and the traffic moving . According to Network Rail's 2013 Report:

- on one gallon of diesel a train can transport one tonne of goods 246 miles whereas an HGV can only travel 88 miles
- Rail freight produces up to ten times less small particulate matter than road haulage and as much as 15 times less nitrogen oxide for the equivalent mass hauled

The use of coastal feeder services to move containers between ports can also make significant savings in terms of road miles, delivering containerised goods closer to the market, particularly where major distribution facilities are available at the destination port or close by. Both Tesco and Asda operate major facilities virtually on the quayside at Teesport where they receive containers directly from ships, de-van and then consolidate into bespoke delivery orders for stores and other, smaller distribution centres. Although visiting ships do produce emissions while on berth, the development of cold ironing infrastructure within our major ports to supply shore-side power to vessels could help to mitigate against any deterioration in air quality in and around port facilities.

4.1. Are there efficiencies within freight management and distribution practices that could help reduce the CO2 and NOx emissions from freight?

The number of road tonne-miles to inland distribution hubs could be reduced by less reliance on using overland options from Europe or routing so much tonnage through southern ports. The benefits of shift to shipping goods for northern markets through northern ports could be extended with the greater use of port-based warehousing and distribution, and more integration of port and rail.

Fuel-efficient driver training for HGVs and van operators has been shown to have benefits as has the greater use of in-cab technology (telematics systems), driver and route performance analysis tools and better route planning.

The Department for Transport has estimated that 'empty running' accounts for 27% of total HGV vehicle miles. It would be useful to have a more detailed understanding of whether this is a particular issue for particular sectors or areas of the country, and where the issue has perhaps been reduced.

4.2. What role do alternative fuels such as electricity, Liquid Petroleum Gas and biofuels have to play? What are the barriers and challenges to wide-scale uptake of alternatives to diesel and what could be done to help remove these issues?

A number of larger logistics operators are moving to alternative fuels, where savings can be made on running costs as well as the environmental benefits, but operators have reported to The Department of Transport a cost differential of between £15,000 and £44,000 premium of a dual fuel HGV over the comparable diesel HGV. Although gas fuel may be cheaper, operators have to take into account the availability of a comprehensive refuelling infrastructure and the whole-life costs of a vehicle including the potential to sell-on to the second-hand market.

Larger road haulage operators, not operating in specialist sectors, will typically only keep vehicles for about 4 years so a significant proportion of the fleet is being regularly renewed and moving towards greener options. Typically, greener options are still diesel owing to the wider availability of Euro Vl engines, fuelling availability, relative costs and ongoing demand in the second-hand market.

Smaller operators and owner-drivers, whether HGV or LCV, are more reliant on the second-hand market and older vehicles which means that they are potentially more economically exposed to any requirements for cleaner vehicles and will face greater challenges in terms of this agenda.

Alternative Refuelling infrastructure needs to be more widely available and some consideration given to smaller operators in terms of more challenging capital costs, e.g, scrappage schemes to encourage wider take-up of greener vehicles.

4.3. What technologies could best and most realistically be utilised to manage the carbon impacts of freight, both within urban areas and on longer strategic journeys?

We need to develop alternative power for road and rail that doesn't impact negatively on the ability to deliver the service required by customers or already tight operating margins. An approach should be developed that clearly recognised that the freight sector comprises a number of sub-sectors and different operators will have different needs.

5. How could new technologies be utilised to increase the efficiency and productivity of UK freight?

No Response

5.1. How will new technologies change the capacity and performance of the freight transport network? Over what timeframes might these new technologies begin to affect the freight transport network?

No Response

5.2. How can the use of data such as real-time traffic information by artificial intelligence and machine learning systems help to improve freight efficiency and productivity? How might this affect the business models and requirements of freight in the future? Are there any barriers to the greater use of data in freight?

No Response

5.3. How do you see technologies such as HGV platooning, digital railway signalling, and autonomous vehicles being integrated into freight distribution?

No response

5.4. How might regulations and physical infrastructure need to adapt to new technologies and business models in the freight sector?

No response

6**. Are there good examples internationally of freight systems, policy, infrastructure or technology development and implementation that the UK can learn from to increase freight efficiency and/or reduce the carbon and congestion impacts?**

No response

north east combined authority

North East Combined Authority response to

National Infrastructure Commission

Freight Study Call for Evidence

January 2018

Contact for any queries/comments regarding this response:

[Name redacted]

[Job title redacted]

North East Combined Authority

C/o Newcastle City Council

Civic Centre

Barras Bridge

Newcastle upon Tyne NE1 8QH

[Email address redacted] / [Telephone number redacted]

Background to the NECA and this response

The NECA was created in 2014. It is a legal body that brings together the seven councils which serve County Durham, Gateshead, Newcastle, North Tyneside, Northumberland, South Tyneside and Sunderland.

In 2016, the NECA consulted on its Transport Manifesto, the precursor to the full Strategic Transport Plan (which we intend to publish as a draft for public consultation in 2018). There were over 1,700 responses to the Transport Manifesto consultation from a wide range of individuals and organisations across the North East.

Nexus is the Tyne and Wear Passenger Transport Executive and provides, plans and promote public transport in Tyne and Wear. Transport operations are administered in Northumberland and County Durham are administered by the respective local authorities.

The North East is home to a very successful Freight Partnership which has been operating since 2005. The partnership promotes safe, efficient and sustainable freight movement in the region. These comments have been discussed with partnership members. The NECA is also a partner of Transport for the North and is engaged in its activities.

This response addresses the main questions from the consultation.

General Comments

Maintaining and improving a sustainable and integrated transport network that supports the mobility needs of businesses is a key goal of the authority, in order to promote economic growth and enhance the quality of life for people living in the region. We also recognise the significant employment opportunities the logistics industry provides in the North-East area.

We must ensure the onward vitality of the freight sector and address the skills gap with the ageing population. Feedback from our freight operators in the region is that journey time reliability is the main priority for them.

Air quality is an issue of serious concern to both NECA and the individual local authorities which it comprises. One of the challenges is the need to ensure that the industry within the region operates as safely and sustainably as possible. We address this below.

Response to questions

1. What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?

The challenge to the efficient movement of freight in the UK can be broken down into the following:

Capacity: The Capacity of the network to manage demands, air, road, rail and water.

Resilience: The need for a resilient network to provide certainty over movement of goods.

Technology: The drive towards more efficient movements of freight with new technologies can have cost and access implications

Connectivity: Access to networks to move freight from terminal, hub and destination locations.

Skills and Workforce: The Freight Transport Association and Road Haulage Association note that the logistics sector has an increasingly ageing workforce. In 2016 the industry was short of about 45,000 drivers and that a further 40,000 drivers would leave the industry by 2017.[1]

Cost: The challenge is that the freight industry is a low margin industry, therefore any changes which increase overall costs could adversely impact on the sector.

We address each of these through the following questions.

1.1. What do you see as the key drivers to a successful freight system that is fit for the future?

A reliable and resilient network that delivers goods on time and at a cost-effective rate is the vision.

Increasing the workforce to support the industry given the driver shortage and increasing age profile of the workforce is necessary. The NE Freight Partnership are working with colleges, operators and trade organisations to raise the profile of this matter and take steps through apprenticeship schemes and similar to take small steps towards addressing it. It's clear however that wider support to ensure that we have a logistics sector fit for the future is necessary. Options include focus on logistics within further and higher education programmes and links with industry for work experience opportunities.

[1] Transport Select Committee, Skills and workforce planning in the road haulage sector, Available online at, https://publications.parliament.uk/pa/cm201617/cmselect/cmtrans/68/6805.htm, Accessed on the 01/03/2018

With 20% or more of sales taking place on the internet[2], an efficient logistics network to meet consumer needs is vital to the ecommerce market. Click and Collect services have seen a substantial rise together with demands for next day delivery. This places a need on a sector to move goods quickly over distance with more vehicles and drivers.

The advance of technology is a driver for change. The sector's work in alternative fuels and automation on the highway network will impact the future shape of the industry. This could mean that goods can be conveyed quicker. There will be more start-up costs and how this is managed is important.

1.2. Which are the key freight corridors that matter the most? Where are the bottlenecks in the freight network, and what investments in upgrades could deliver the best value for money for freight efficiency and UK plc?

The North East's Ports offer significant capacity to important and export. Activity is however focused in the South and East with hubs traditionally in the Midlands. In 2016, the North East's ports handled 5.7 million tonnes of freight. This is a small percentage of port activity. Anecdotally this is due to the reliability and resilience of the road network. With capacity concerns at South East Ports and investment in the Northern road network, there is a real opportunity to increase movements into Northern Ports.This is only possible if the investment as outlined in TfN's plans for the North;s road and rail links is delivered.

1.3. To what extent are the economic benefits of freight factored into wider transport infrastructure investment planning?

The performance of the logistics sector often closely follows the performance of the UK economy more generally. The economic benefits attributed to the employment that the sector generates should be noted. Across the country it represents around 5% of all employees and is an enabling capability towards achieving the transformational economic growth envisaged in TfN's plans.

1.4. What are the regulatory and legal issues that, if changed, could improve freight efficiency without increasing costs or reducing efficiency?

No response

2. How might the demand for freight develop and change over the next 20-30 years?

[2]SHD logistics, Changing Retail Landscape, Available online at, http://www.shdlogistics.com/news/changing-retail-landscape-and-supply-chain-priorities-magnified-at-edx-2018. Accessed on the 01/03/2018.

It is envisaged that we will continue to see an increased demand for ecommerce and faster deliveries. Alternative vehicles such as Amazon's test of drones[3] may provide solutions as will technologies such as platooning on the long haul routes.

Based on capacity and sustainability, we envisage there may be a need to switch thinking for freight travelling on alternative modes such as rail and sea.

The digitisation of the industry may continue with barcode or Near Field Technology to track shipments which is of benefit to the customer but also in the decision making around on routes.

Freight sharing and consolidation to reduce cost and overall environmental impact may be a move into the future, increasing efficiency with more backhauling.

2.1. How has the demand for freight, and types of freight, changed over the last two decades, and what will be the drivers for changes in the future?

The industry has become more digitised and agile in nature to meet the demands of e-commerce and just in time deliveries. Whilst large bulk hauls of materials such as coal have drastically reduced they have been replaced with materials such as biomass.

There has been a shift in requirement for more frequent smaller loads (commercial vans – average increase approx. 5% since 2013). Typically HGV's are doing longer routes (distance) but carrying less loads (weight). There has been a large increase in Port Activity – infrastructure of road routes from Ports to main highway areas

Eg – large increase in Port of Blyth due to it now operating deep port – but road infrastructure from port is single carriageway through residential areas – common theme in north east. Investment in the North East's road and rail infrastructure to ports is therefore needed.

2.2. How is the freight industry planning for future changes in the demand? What levers might be available to shape future demand for freight transport?

As Above

3. What effects does congestion have on the efficiency of freight movement and emissions?

The pressure described earlier of goods being delivered at an ever-faster rate results in the need for more vehicles. Vans are the fastest-growing traffic segment in the UK, with 70% growth in road miles over the last 20 years[4]. This has implications on

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[3] The Future of Freight, Available online at, https://www2.deloitte.com/insights/us/en/focus/future-of-mobility/future-of-freight-simplifying-last-mile-logistics.html. Accessed on the 01/03/2018

[4] Implication on Internet Shopping Growth on the Van Fleet and Traffic Activity, Available online at, https://www.racfoundation.org/wp-

congestion and makes it difficult to deliver goods reliably. The latest Inrix statistics shows that in the UK, the worst traffic hotspots in 21 cities were identified and the cost to drivers of time wasted in congestion could amount to £61.8 billion over the next ten years[5].

Congestion has impacts on air quality with increased pollution from slow moving or vehicles stopped. Measures to increase capacity can be effective but are costly and impact on the surrounding environment built and or natural environment. Other options include the potential for switching to alternative modes such as water and rail and consolidation.

Consolidating and focusing on the last mile for deliveries can be effective but is costly and challenging to set up. It would help to address some of the space and congestion constraints for deliveries in urban areas as well as improving air quality.

3.1. How does congestion impact upon the productivity and economic contribution of freight? To what extent does congestion affect changes to mode, time or other freight choices?

Typically, the less reliable and more costly the journey the more there is potential to look towards alternative modes to make that journey and or to retime it. The alternatives however must be economically viable as to make that change.

The economic case for change is supported by the wider environmental impacts of reducing emissions from freight movements. This helps support freight on rail to some extent air and water, provided that there is a suitable connection from port or terminal to destination. Rail Freight in the North East could be enhanced with an investment in a terminal facility. As well as delivering rail access to Newcastle Airport to increase freight throughput there.

3.2. How does congestion affect the environmental impacts of the movement of freight?

As above

3.3. With limited space for new infrastructure, how can we better use our existing urban network to support freight? Are there changes – such as changes to modes, methods, or delivery times -that could help reduce the stress on the urban transport network?

Retiming and re-moding have a significant benefit to the reliability of journeys into typically congested areas. There are challenges including noise and amenity

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content/uploads/2017/11/The_Implications_of_Internet_Shopping_Growth_on_the_Van_Fleet_and_Traffic_Activity_Braithwaite_May_17.pdf. Accessed on the 01/03/18

[5] Inrix, Congestion Hotspots, Available online at, http://inrix.com/press-releases/inrix-reveals-congestion-at-the-uks-worst-traffic-hotspots-to-cost-drivers-62-billion-over-the-next-decade/ Accessed on 01/03/2018.

concerns of deliveries taking place out of hours. With the correct management solutions this can be successful.

An example would be the deliveries in Central Newcastle which take place early morning or evening, avoiding busy periods in the city centre. There is still a role in expanding and improving the highway network where necessary but this must be done in combination with other demand management measures. It doesn;t happen everywhere and guidance such as that delivered by TfL for night time deliveries could be relooked at

With Rail Freight, there is typically a poor optimisation and usage of it as a transport method. This would support lower emissions,

- With a network of Rail Hubs across country – this would provide a suitable location to offload and load. The North East doesn't have such a facility and is keen to develop one as a national network of rail freight terminals.

- Deep water Port expansions –ports with shallow bays which are not in use, could be invested in to extend to deep water to open up opportunities to ship by water.

4. How can freight lower its carbon and air quality impacts?

With regard to the reduction of the limited alternative fuels that exist for HGV's over a long distance is a concern. Alternative fuels are not currently practical for the clear majority of HGV's on the network, as such the work that is being undertaken through the Low Emission Freight and Logistics trial is welcomed and its findings should be enacted by Government.

As above switching mode is not possible in all cases but can have benefits to the environment.

4.1. Are there efficiencies within freight management and distribution practices that could help reduce the CO2 and NOx emissions from freight?

As above

4.2. What role do alternative fuels such as electricity, Liquid Petroleum Gas and biofuels have to play?

As above

What are the barriers and challenges to wide-scale uptake of alternatives to diesel and what could be done to help remove these issues?

In 2017 the current number of ULEVs in the NECA area is **2,751** (Q2, 2017) [6]which is **2.3%** of all ULEVs in the UK. If the market continues to grow as it is currently, the

[6] DfT Statistics - https://www.gov.uk/government/statistics/vehicle-licensing-statistics-april-to-june-2017

NECA area will be home to **7,500 ULEVs** by 2020. In October 2017 nationwide this has increased to 119,000 vehicles.

This figure is not enough to achieve the UK's targets which suggest that we need between **17,476 – 20,740** ULEVs in the NECA area by 2020, meaning that a major step-change is required.

The UK network of EV charging points has increased from a few hundred in 2011 to more than 4,300 charging locations, 6,700 charging devices and 12,500 connectors by May 2017. The proportion of charger types has also changed dramatically during that time with an increase in high power (rapid) units being installed across the UK.

Here is pioneering studies being undertaken by 'Heineken' with electric Volvo HGV Trucks and this could be explored.

For freight and logistics this is focused mainly on the van and LGV market whilst trials take place on viable alternative fuels for HGV's.

4.3. What technologies could best and most realistically be utilised to manage the carbon impacts of freight, both within urban areas and on longer strategic journeys?

Engine stop/start technology on commercial vans, in its infancy at the moment, push to expand this area – any vans in congestion have reduced carbon footprint

5. How could new technologies be utilised to increase the efficiency and productivity of UK freight?

The following technologies / techniques could be studied

- Offloading – pick and drop systems installed in warehousing – speed up unloading
- Fork Lift Truck design – dual fork systems, pick double loads from HGV
- Shared logistics hubs by larger companies, one point of drop, then distributed to target companies

5.1. How will new technologies change the capacity and performance of the freight transport network? Over what timeframes might these new technologies begin to affect the freight transport network?

As mentioned the digitisation of the industry makes it easier for effective decision making on the best route for freight to take.

Alternative fuels and platooning may be seen in the medium term (up to 2035) with measures to increase the efficiency of bulk haul long distance movements on the network.

Port capacity should be looked at more strategically across the UK, including new markets that emerge and the technologies and capabilities that exist within that area to support port activities of Import and export. It is important from a highway and rail perspective to ensure that these ports both air and water have adequate connections to their markets.

Transport for the North's Freight and Logistics Report[7], provides much more background as the short medium and longer-term interventions for the development of an effective network for the North. It is recommended that this is reviewed.

5.2. How can the use of data such as real-time traffic information by artificial intelligence and machine learning systems help to improve freight efficiency and productivity? How might this affect the business models and requirements of freight in the future? Are there any barriers to the greater use of data in freight?

N/A

5.3. How do you see technologies such as HGV platooning, digital railway signalling, and autonomous vehicles being integrated into freight distribution?

N/A

5.4. How might regulations and physical infrastructure need to adapt to new technologies and business models in the freight sector?

Consideration of physical infrastructure will undoubtedly need to continue to be cognisant of wider economic and business needs in connecting areas of opportunity.

This is happening within the North through the development of TfN's Strategic Transport Plan being built from a robust economic base and the regional plans using Local Enterprise Partnership Data.

The need for agility is more of a challenge and plans should be regularly reviewed and new technologies developed into the infrastructure proposed.

6. Are there good examples internationally of freight systems, policy, infrastructure or technology development and implementation that the UK can learn from to increase freight efficiency and/or reduce the carbon and congestion impacts?

N/A

Conclusion

[7] Transport for the North, Freight and Logistics Report, Available online at, https://www.transportforthenorth.com/wp-content/uploads/TfN-Freight-and-Logistics-Report.pdf, Accessed on the 01/03/2018.

Safe and efficient movement of freight is essential. Movement of goods, usually by road but also by rail and sea, is fundamental to the effective functioning of the regional economy. Furthermore, the freight sector is also an important source of employment in its own right.

It is UK and European policy to encourage the transfer of suitable goods from road to rail and/or inland waterway where there would be benefits for the environment. Although there is some rail freight traffic within the region, tonnages have fallen in recent years due to the decline in coal volumes. Other than at our ports, the region also lacks a rail freight interchange where goods can be transferred to/from rail vehicles. The 2016 Transport for the North Freight and Logistics Report highlights the need for more such interchanges across the north and this is a high priority for NECA and one we will seek to progress, drawing on the evidence base produced through the work of Transport for the North.

We look forward to the NIC's response to this call for evidence and the onward consultation.

UKMPG

1st Floor
30 Park Street
London
SE1 9EQ

Telephone: [Telephone number redacted]
Email: [Email address redacted]

www.ukmajorports.org.uk

By email: Freightstudy@nic.gsi.gov.uk

7th March 2018

Dear Sir / Madam,

National Infrastructure Commission Freight Study Call for Evidence. Response from the UK Major Ports Group Ltd.

Thank you for the opportunity to comment on the National Infrastructure Commission Freight Study's "Call for Evidence". This response is submitted on behalf of the UK Major Ports Group ("UKMPG"). Some individual members may respond in their own right. Several responses involving specific examples don't include detailed quantification for commercial confidentiality reasons.

We have grouped UKMPG comments under particular questions where our response is most relevant, rather than attempt to be comprehensive in addressing each question.

Summary

The UK's major ports are the nation's predominant gateway to the world. 95% of the UK's international trade by volume passes through it's ports, 75% through the ports of UKMPG members. The UK's major ports are a largely unheralded success story for the UK – enabling strategic UK supply chains like manufacturing and energy and ensuring the delivery of food to our tables and goods to our shops. The growth, development and jobs impact of ports activity impacts not just for ports themselves, but their surrounding regions and strategic supply chains throughout the UK. UKMPG members invest around £550 million a year in the UK – likely to be 90% of investment in the UK ports sector. I include with this submission an infographic illustrating this significant contribution to the UK.

But for UK plc to maximise the value of this private sector investment it is vital that its ports are effectively and efficiently connected to the rest of the economy. Major ports are true multi-modal centres, with onward freight transport of the cargoes and containers landed going by road, rail and waterways in descending proportions. An efficient, effective and sustainable freight network in its broadest sense is therefore essential to the success of its ports, the wide range of supply chains that rely on ports and ultimately the success of the UK has a confident, globally trading nation.

With this background, UKMPG would make the following key observations to the Freight Study's "Call for Evidence":

- Major ports are multi-modal transport hubs, combining road, rail and in several cases maritime modes of onward transport for landed cargoes. We strongly believe that a similarly multi-modal approach should be taken to setting transport strategy for key 'arterial' freight corridors that enable trade with the rest of the world.
- UKMPG is encouraged by increasing attempts to bodies such as Highways England and Network Rail to liaise with each other. And the Department for Transport's Port Connectivity

Study is likely to provide welcome support for more integrated thinking. But more can and should be done in terms of setting a strong mandate for integrating across modes and hard wiring such an approach into structures and institutions.

- The routes to ports play a crucial role in facilitating trade. This should be reflected in the evaluations of freight projects, particularly important in a post-Brexit scenario, with UK developing its independent presence in global trade.
- There is a vital role of what might seem incremental improvement projects – junctions, roundabouts etc. to overall freight route efficiency. Such improvements can have a very positive 'value for money' case.
- Such projects are not only those close to ports, but ones some distance from either port or end user but which are substantially impacted by 'corridor traffic'.
- Changing patterns within potential UK port freight flows, such as the relatively faster growth of container traffic within the unitized category, have particular implications for the UK's freight network.
- Tackling congestion can deliver both economic and environmental benefits. Good process management has a proven role to play. The UK needs to look again about how it incentivizes more modal shift.
- Technology and innovation – such as the next evolution of smart motorways and digital signaling – certainly presents opportunities for improvement. But technology alone is not a silver bullet and must be accompanied by upgrades to underlying physical infrastructure and adopting a more integrated strategic approach.

Background on the UK Major Ports Group

The UK Major Ports Group Ltd ("UKMPG") is the trade association representing most of the large commercial ports in the United Kingdom. It has nine members who, between them, own and operate over 40 ports, accounting for 75% of the UK's seaborne trade. As such, the members of UKMPG and their facilities make a highly significant contribution to the UK in several ways:

- ***Vital for UK trade***: With 75% of UK seaborne trade passing through the facilities that they operate UKMPG members are crucial for the success of a confident, global trading nation in a post Brexit environment;
- ***A key driver of UK economic growth***: UKMPG members facilitate strategic UK supply chains, such as the automotive sector (7 out of every 10 cars made in the UK are exported via a UKMPG member,), and are important regional drivers of jobs and wealth for Britain's coastal and waterways communities;
- ***Setting the standard***: Through their expertise and scale UKMPG members provide leadership and critical mass for the development of innovation, skills and industry best practice; and
- ***A sustainable sector***: UKMPG members make a major contribution to more resource efficient UK and world through, for example, enabling modal shift, supporting renewable energy and driving forward operational and environmental best practice.

Current UKMPG members are Associated British Ports, Belfast Harbour Commissioners, the Bristol Port Company, DP World London Gateway, Forth Ports, Hutchison Ports UK, PD Ports, Peel Ports and the Port of London Authority.

For more information please see http://ukmajorports.org.uk/.

Selected questions and responses

1. What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?

1.1. What do you see as the key drivers to a successful freight system that is fit for the future?

Major ports are multi-modal transport hubs, combining road, rail and in several cases maritime modes of onward transport for landed cargoes. We strongly believe that a similarly multi-modal approach should be taken to setting transport strategy for key 'arterial' freight corridors that enable trade with the rest of the world. Taking such a holistic approach should better enable Government and UK plc not only devise a more efficient freight network, but prioritise the need for investment and capture more environmental benefits. For example, UKMPG notes and supports Transport for the North's efforts to take such a multi modal / corridor approach and believe that a similar approach should be taken for the UK as a whole.

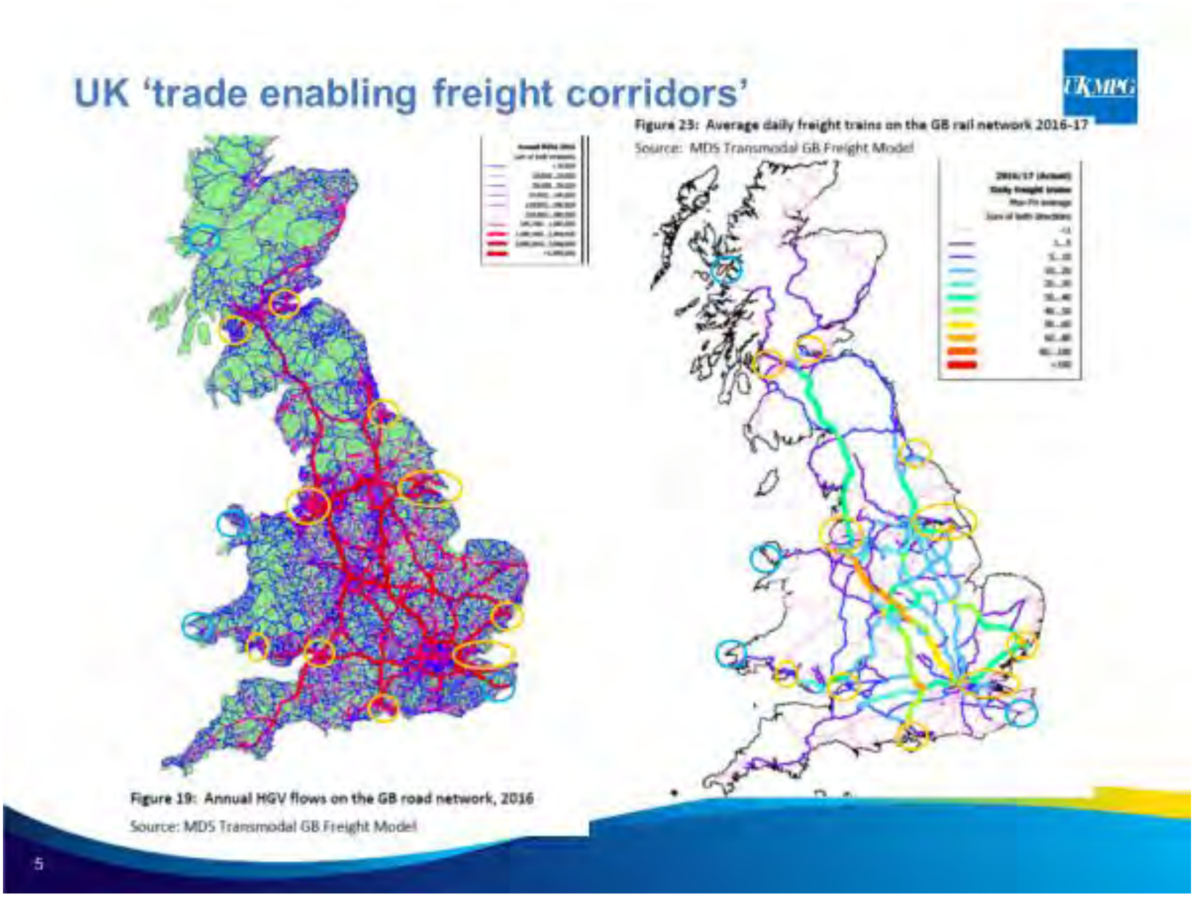
UKMPG is encouraged by increasing attempts to bodies such as Highways England and Network Rail to liaise with each other. And the Department for Transport's Port Connectivity Study is likely to provide welcome support for more integrated thinking. But more can and should be done in terms of setting a strong mandate for integrating across modes and hard wiring such an approach into structures and institutions.

1.2. Which are the key freight corridors that matter the most? Where are the bottlenecks in the freight network, and what investments in upgrades could deliver the best value for money for freight efficiency and UK plc?

High level mapping of road and rail freight volumes clearly demonstrate key freight arteries in the UK. The graphic below takes such mapping, performed by MDS Transmodal, onto which UKMPG has added indications of the local of key ports and clusters of ports in the UK (top 10 by volume plus selected others). Orange circles are UKMPG members, blue are other ports.

In almost all cases the UK's major ports are the start and finish points to high volume freight routes, both road and rail. These high-volume freight routes themselves are linked in turn to key dense manufacturing regions such as the West Midlands, Yorkshire / Lancashire / M62 Corridor and North East coast as well as key logistics clusters such as the Daventry 'Golden Triangle', Midlands and M25. We understand that the forthcoming Department for Transport's Port Connectivity Study will identifying these corridors, which we welcome.

Taken together UKMPG believes that it is clear that there are a relatively small number of freight corridors, which in many cases comprise both road and rail, that effectively connect the UK to the world. This is not a 'nice to have'. Not only is connectivity to the world essential to the UK's exporting industries, it is crucial to essentials of life like as energy and food (with the UK importing half its food and feed needs).



UKMPG particularly welcomes the mention of "bottlenecks" in the question. There is a vital role of what might seem incremental improvement projects – junctions, roundabouts etc. to overall freight route efficiency. In the experience of UKMPG members such improvements can have a very positive 'value for money' case, often against grand projects. Such bottlenecks are not limited to areas close to ports. They can be a significant distance away (in one example even the other side of a sea crossing) but can present important pinch points for the whole route. This is true both for road and rail freight routes. Some specific examples are:

Close to ports	Pinch points on key routes	Rail
• A33 terminus, Southampton • A63 / Castle Street, Hull	• A34 / M3 junction, near Winchester • A1(M) interchange west of Middlesbrough • A75 Cairnryan / Stranraer to Gretna • A14 – we note and welcome the action already planned	• Gospel Oak to Barking trans London route • Trans Pennine routes • Oxfordshire / South Midlands interchanges

Improvements to such bottlenecks not only allow freight to flow more freely. They also help to alleviate local congestion and, in some areas, will better enable further residential development. However, the differing drivers and demands of local governance and nationally significant routes can be an issue. We welcome initiatives such as the Major Roads Network but believe more can be done to strengthen integrated freight planning and its weight in decision making.

1.3. To what extent are the economic benefits of freight factored into wider transport infrastructure investment planning?

UKMPG's members experience is that freight has too often been the poor relation in the transport debate. Boxes don't vote or tweet. Nonetheless freight keeps the economy moving, our lights on and the population fed. But the lack of weight given to freight on constrained routes means that it can take perhaps 9 hours to transport a cargo of biomass from Liverpool to Drax power station, a distance of only around 100 miles.

UKMPG would suggest in particular that it is important to make sure that future investment in transport infrastructure reflects the need to encourage trade and, in particular, exports. Research commissioned by Associated British Ports, a UKMPG member, suggests that this can be achieved by adjusting the Government's approach to transport infrastructure investment appraisal by:

- including explicit recognition that encouraging trade and exports is a strategic priority; and
- capturing the full economic benefits of increased trade and deficit reduction.

These adjustments may be reflected in HM Treasury's Green Book, which provides a framework for Government investment decisions, as well as other guidance such as the Department for Transport's Web-based Transport Analysis Guidance ('Web-TAG'). A change in approach should also be reflected in decisions taken by Government-funded bodies such as Network Rail and Highways England.

1.4. What are the regulatory and legal issues that, if changed, could improve freight efficiency without increasing costs or reducing efficiency?

As highlighted in our response to Question 1.1 UKMPG believes an integrated, strategic approach to freight for key trade enabling corridors would unlock value for the UK.

As highlighted in our response to Question 1.2 UKMPG believe that there are some immediate practical steps that could be taken in how transport decisions are assessed and made to boost trade enabling freight.

2. How might the demand for freight develop and change over the next 20-30 years?

2.1. How has the demand for freight, and types of freight, changed over the last two decades, and what will be the drivers for changes in the future?

The Department for Transport's forecasts, albeit now somewhat dated, forecasts suggest growth in the volumes handled by UK ports in the mid term, notably container traffic. Total port tonnage for the UK is forecast to grow by 37% from 2004 – 2030. Container traffic will grow by 178% (in terms of twenty foot equivalent units (TEU)) and bulk traffic will increase by 8% over the same time period. This faster growth in container traffic is also supported on a global level by a more recent study by McKinsey which forecasts between 1.9-3.2% p.a. growth all the way to 2067.

It's also important to look at the composition within the overall headline numbers to understand the impact on freight. Actual volumes handled by UK ports fell by 17% from 2005 to 2016 – the most notable driver being the 77% fall in coal imports as the UK seeks to decarbonize its energy sector.

Changing patterns within the freight shipping sector as well. Shipping lines have consolidated and have formed alliances. Vessels, notably in the faster growing container sector, have grown considerably (e.g. state of the art growing from 9,200 TEU in 2005 to 21,400 TEU in 2017) with probably some more growth to come.

This points to some important implications for the UK's freight network – steady growth from port related freight but with changes in its composition, a changing role for rail likely with upward growth in its freight share, road haulage still playing a vital role and probably retaining share leadership, and greater peaking demand as larger vessels load and unload in concentrated areas.

3. What effects does congestion have on the efficiency of freight movement and emissions?

3.1. How does congestion impact upon the productivity and economic contribution of freight? To what extent does congestion affect changes to mode, time or other freight choices?
Customer feedback suggests that congestion to and from ports can have a significant impact on productivity for the customer. Shipping and ports play vital roles in today's just-in-time supply chains. On average 60% of a car assembled in Britain made using components imported from elsewhere in the world. Inefficiency, unpredictability and unreliability in the flow of components to the assembly plant clearly poses a huge threat to their world-leading productivity. We would also note that predictability and consistence of journey times is in many cases as important as the journey time itself. UKMPG members also report that quality and capacity of transport links (including reaching 'critical mass' in areas such as rail freight volumes) are highly important elements in attracting and retaining customers.

3.2. How does congestion affect the environmental impacts of the movement of freight?
Congestion and its better management is one of the most effective levers for improving environmental performance, for example in air quality. A number of major ports have made significant improvements to local air quality levels through more structured and proactive traffic management. This includes making hauliers booking specific slots (with a 30-60 minute window) to enter the port. This manages flow and reduces congestion. However, its important that these systems are matched by reliability and consistency in journey times. Otherwise hauliers have to build in 'just in case' latency, potentially just shifting the impact of standing traffic elsewhere.

Although it is relatively obvious, it would be remiss of UKMPG not to highlight that the most straightforward way of reducing freight congestion at scale is to further increase the share of freight moved by rail. All UKMPG members on mainland UK have the desire to increase the share of their onward transport by rail. Barriers to this are the availability of practical freightpaths, pinch points on the system and some economic factors. Particularly in terms of the economics, it seems perverse to UKMPG that, given Government objectives for both economic growth and environmental improvement the incentives to use rail for freight (such as the Modal Shift Revenue Support scheme) are continually cut. We would seek a reversal in this trend.

3.3. With limited space for new infrastructure, how can we better use our existing urban network to support freight? Are there changes – such as changes to modes, methods, or delivery times - that could help reduce the stress on the urban transport network?
A number of UKMPG members successfully operate inland shipping services, such as the Thames and the Manchester Ship Canal. There is the ambition to do more, such as the Port of Leeds concept. These services, although currently a fraction of overall freight volumes, do offer an alternative to moving freight into cities, reducing the stress on land-based transport. They also have their challenges – notably the availability of city center wharves due to the demands of residential property development. Coastal shipping also offers another alternative for towns and cities on the coast which is currently underutilized.

4. How can freight lower its carbon and air quality impacts?

4.1. Are there efficiencies within freight management and distribution practices that could help

reduce the CO2 and NOx emissions from freight?
See responses to Questions 3.2 and 3.3.

4.2. What role do alternative fuels such as electricity, Liquid Petroleum Gas and biofuels have to play? What are the barriers and challenges to wide-scale uptake of alternatives to diesel and what could be done to help remove these issues?
Alternative fuels will undoubtedly have a massive role to play in the future of freight transport. Major ports are already pursing opportunities in this area, such as the electrification of ports operations and transport service vehicles. UK ports have also already successfully fueled customer vessels with LNG. We see this trend continuing. Barriers to this trend include infrastructure. The availability of high capacity electricity connectivity for some ports is a problem, particularly if load is likely to increase. Regulation is also a factor in some circumstances, such as the incompatibility of COMAH requirements and cruise ships. More general business factors also play a part – the economics of some alternative fuel applications still needs to improve and some parts of ports activities have a relatively long asset life.

5. How could new technologies be utilised to increase the efficiency and productivity of UK freight?

5.1. How will new technologies change the capacity and performance of the freight transport network? Over what timeframes might these new technologies begin to affect the freight transport network?
New technologies and the increased use of high volumes of real time data should allow significant increases in the efficiency of the freight network. Smart motorways, probably allied to increasingly autonomous vehicles, and digitalization of railway signaling certainly have significant potential. However, technology on its own is not a silver bullet. It must go hand in hand with continued investment in upgrading underlying infrastructure (such as railway gauges) – although perhaps mitigating some wholly new investment – and taking an integrated strategic approach on key corridors.

6. Are there good examples internationally of freight systems, policy, infrastructure or technology development and implementation that the UK can learn from to increase freight efficiency and/or reduce the carbon and congestion impacts?

The US Government guidelines for applications to its TIGER ('Transport Investment Generating Economic Recovery') Programme could well have applicability for developing the strategic UK freight network, e.g.: "Priority consideration will be given to projects that: (i) Improve long-term efficiency, reliability or cost competitiveness in the movement of workers or goods (including, but not limited to, projects that have a significant effect on reducing the costs of transporting export cargoes), or (ii) make improvements that increase the economic productivity of land, capital or labor at specific locations."

***

UKMPG would be happy to discuss the content of our response further with the NIC
to ensure that the UK is delivering the right freight network and integrated strategic approach to its development to ensure the continued success not only of the UK's major ports but also the UK economy as a whole.

Yours faithfully,

[Signature redacted]

[Name redacted]
[Job title redacted]
UK Major Ports Group

National Infrastructure Commission:

Call for evidence on Freight

March 2018

Call for evidence on Freight – consultation questions

1. *What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?*
2. *How might the demand for freight develop and change over the next 20-30 years?*
3. *What effects does congestion have on the efficiency of freight movement and emissions?*
4. *How can freight lower its carbon and air quality impacts?*
5. *How could new technologies be utilised to increase the efficiency and productivity of UK freight?*
6. *Are there good examples internationally of freight systems, policy, infrastructure or technology development and implementation that the UK can learn from to increase freight efficiency and/or reduce the carbon and congestion impacts?*

Summary of response

The effective movement of freight is an essential enabler to the growth and prosperity of the UK. It is for this reason, that improving the efficiency of the UK's freight network is a perennial debate. One form of transport infrastructure that's already in place in London, which cuts through the length of the city is the River Thames. At Cory Riverside Energy (Cory), we believe it's debatable whether London's freight system is making the most of its natural waterway. We set out some reasons why in our response, focusing on the challenges faced in delivering freight into/out of London, the area where our businesses operate. We believe increasing river freight is paramount to the future success of our capital city.

Our plea is for the National Infrastructure Commission (NIC) to set out a clear strategic statement on the importance of a modal shift that increases river use in their forthcoming assessment. Additionally, we present some policy recommendations, which emphasise actions that would support the increased use of river freight for the transport of goods and materials.

Policy Recommendations

Cory make four key policy recommendations to the NIC for consideration. We believe these, especially in the London context, would help ensure river infrastructure is fully integrated into the future of UK freight. These are:

1. **Broad recognition of the role that inland waterways could play in removing freight from the UK's congested roads.**

   With high-level political leadership, commitment, and the correct standards in place, the UK – in particular London – could revive one of its past industries, whilst providing transport solutions that reduce traffic congestion, increase cyclist and pedestrian safety, lower UK carbon emissions, and reduce local air pollutants.

2. **Protection of existing wharves.**

   Ensuring the existing capacity and operability of wharves in London is retained is of the upmost importance to facilitate growth. Current plans by Transport for London (TfL), to conduct a safeguarding review of London's wharves, is an excellent starting point[1]. Furthermore, a clear signal that Safeguarded Wharves are not on the market for residential development – to prevent the rise of 'hope value' – would be a welcome policy development at the national level.

3. **Identify new locations for additional waterborne freight.**

   For river freight to deliver on its potential, it must expand into new locations in London. Development proposals that facilitate an increase in river freight should be overtly supported by planning authorities. Moreover, the reactivation of vacant safeguarded wharves would be a positive step. New plans in development by TfL for common user berths and freight delivery hubs[2], are encouraging steps for London, and will provide a useful test bed for the UK. The success of freight delivery hubs, is contingent on involving multiple parties – neighbouring industrial users, private businesses, and transport regulators – in discussions over co-location from the early stages.

4. **Incentivise use of commercial wharves, for example through the increased use of grant funding[3].**

   Companies need to be actively incentivised to use the river. In London, it is currently more financially viable to transport consumer goods on the road instead of the river. The reason for this is freight companies using the roads are not bearing the true/full cost of road usage i.e. environmental cost, damage to road networks, costs of congestion, human health etc. Instead these costs are passed on to third parties or wider society.

   To counter this, financial incentives should be developed and enhanced to promote the use of London's rivers. The existing grant scheme available to freight companies looking to switch from road to river, known as the Modal Shift Revenue Support Grant (MSRS) currently provided by the Department of Transport (DfT)[4], should be expanded. Additionally, a London specific scheme would help promote water freight further, particularly in the capital where freight travel can be particularly expensive. In conjunction with expanding incentives, improving the road connections to and from wharves is key, enabling wharves to provide a competitive and commercially attractive service in comparison with road use.

[1] https://www.london.gov.uk/sites/default/files/freight_development_working_group_meeting_presentations_-_5_dec_2017.pdf

[2] https://www.london.gov.uk/sites/default/files/freight_development_working_group_meeting_presentations_-_5_dec_2017.pdf

[3] As outlined in the ICE Report. October 2017: Engineering Cleaner Air. See here

[4] https://www.gov.uk/government/publications/mode-shift-revenue-support-msrs-scheme-2015-to-2020

Case study: Cory Riverside Energy on the River Thames

The Thames is London's central river and is used in a number of ways to transport goods and materials. For our part, Cory's business has been serving London through the generations for more than a hundred years, doing its part in solving the city's waste and energy challenges.

Cory use the Thames to export waste from the City of London, Wandsworth and Battersea, to the largest-of-its-kind energy from waste (EfW) facility on the south shore of the Thames in Belvedere.

Working closely with local authorities, Cory manage over 1 million tonnes of London's waste and aggregates. Our use of the river Thames to carry residual waste and construction aggregates avoids some 100,000 truck movements a year on London roads.

To learn more about our use of the River Thames, check out our video describing it in detail here.

Increasing use of the River Thames

Ensuring the River Thames is considered a key part of London's transport system, and not as an addition, is crucial. The challenge in increasing river freight volumes, predominantly rests in the very limited number of operating wharves in central London. We consider the wharves that remain need to be protected, and those wharves under threat from development should always require the wharf use to be retained. Planning policy should ensure developers are required/ encouraged/ incentivised to utilise only the air rights. Thankfully, there appears to be a strong appetite in the Port of London Authority (PLA) to redevelop wharves in association with TfL. With the right wharf infrastructure, business will actively and energetically contribute to the regeneration of the River Thames as a major freight highway. River freight in London has many benefits which we evidence and bring to the attention of the NIC below:

- **Congestion:** Cory believe London's rivers, canals and natural assets reduce congestion, road traffic accidents, carbon emissions and harmful air pollutants. London is undoubtedly one of the most-congested cities in the world, frequently topping or placing highly on congestion ranks. Transport for London (TfL) estimated that the cost of congestion to drivers was £5.5 billion in 2014/15[5]. Latest data from the INRIX study shows London remains the UK's most congested city and ranks second in Europe after Moscow and seventh in the world[6]. Drivers in London spent an average of 71 hours in gridlock

[5] Transport for London, Total Vehicle Delay (2015): http://content.tfl.gov.uk/total-vehicle-delay-for-london-2014-15.pdf
[6] Inrix. 2018. Global Traffic Scorecard. See here

during peak hours. Compared to 2016, congestion and speeds have improved slightly within the city centre, but gotten worse on arterials into and out of London. This can be predominantly explained be the increase in distance travelled by light goods vehicles (delivery vans). London has been incredibly successful at encouraging modal shifts away from private vehicles, but the mechanisms used to achieve this (e.g. public transport investment, cycle promotion, congestion charging) will have little impact on the growth of LGV related congestion. In London specifically, 29% of vans which enter the city are less than one quarter full; the average load is 38% full. Deliveries often start outside the city and freight operators often view the city as a problem to be negotiated. This leaves them disconnected from the area they operate in. A modal shift of freight to river, holds the potential to reduce traffic congestion.

- ***Economic benefits*:** road freight causes damage to the foundations and structures of roads, more so than cars, because the damaging power rises exponentially[7] as weight increases[8]. This is called the Generalized Fourth Power Law: the damage caused is related to the axle weight of the goods vehicle by a power of four[9]. Road is by far the dominant mode for goods transport in London in terms of weight of goods lifted[10]. TfL research concludes that 90% of all freight lifted in London is moved by road[11]. Therefore, a modal shift of freight to river holds potential to reduce road maintenance costs significantly. According to official reports, a single heavy HGV axle load causes roughly 150,000 times more road damage than a typical car axle[12].

- ***Reduces carbon emissions*:** The challenge to decarbonise transport is pressing and will continue to rise up the policy agenda. According to the latest statistics from BEIS, transport is now the largest carbon emitting sector in the UK, constituting 26% of all emissions[13]. TfL estimates that LGVs and HGVs were responsible for 10 per cent and 13 per cent of road transport greenhouse gas emissions in London in 2010 respectively[14]. The main source of emissions from this sector is the use of petrol and diesel in road transport. Whilst river vessels contribute to greenhouse gas emissions, transport by barge is estimated to produce between a fifth and one third of the emissions per kilo carried, compared to the equivalent journey by lorry[15]. At European level, energy consumption per km/tonne of goods via waterways has been calculated to be about 17% of that of road transport and 50% of rail transport[16].

- ***Improves local air quality*:** The Thames has long been recognised as a more environmentally appropriate route for moving bulk materials such as building materials and rubbish. Diesel road traffic has risen over the past decade due to Government policies to meet carbon emission goals and this has led to a degradation in air quality, with diesel now contributing around 40% of London's NO_x emissions. The social costs of air pollution in the UK have been estimated at £15 billion a year – similar to the cost of obesity or alcohol abuse [17]. Emerging calculations from the PLA's first-of-its-kind Air Quality Strategy, highlights that "*waterborne option presents an improved air quality scenario compared to the road equivalent. Based on the two scenarios tested, waterborne emissions resulted in around four to six times less impact on NO2 concentrations at the point of measuring air quality close to population centres compared to the equivalent transits by road*" [18]. This confirms there is significantly less exposure to public health impacts of pollutants from the river source than the comparable road

[7] Transport and Road Research Laboratory: Road Note 29. See here
[8] http://www.bettertransport.org.uk/blog/better-transport/lorries-cause-more-damage-roads-cars
[9] http://www.nvfnorden.org/lisalib/getfile.aspx?itemid=1586
[10] TfL London Freight data 2014 update. http://content.tfl.gov.uk/london-freight-data-report-2014.pdf
[11] Integrated Impact Assessment of the Mayor's London Environment Strategy. 5.2.7.2: https://www.london.gov.uk/sites/default/files/iia_scoping_report_final.pdf
[12] Metropolitan Transport Research Unit - Heavy Goods Vehicles report for Campaign for Better Transport: June 2014. See here
[13] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/679334/2016_Final_Emissions_Statistics_one_page_summary.pdf
[14] TFL London freight data 2014 update. http://content.tfl.gov.uk/london-freight-data-report-2014.pdf
[15] For examples see, http://timeforchange.org/co2-emissions-shipping-goods, and Wandsworth Borough Council news release, 2015 (http://www.wandsworth.gov.uk/news/article/13115/tube_on_its_way_to_battersea_as_work_starts_on_northern_line_extension) cited in http://www.pla.co.uk/assets/thevisionforthetidalthames.pdf
[16] PLA. Draft Air Quality Strategy. See here
[17] Policy Exchange. 2012. Something in the air. See here
[18] PLA. Draft Air Quality Strategy. See here

source due to the distance (see Figure 1 below). In addition to this, river operators are looking at ways in which emissions can be reduced further from vessels in the tidal Thames and will be working closely with the London Authorities, via a specific air quality working group, to realise the ambitious aims of the air quality strategy and reduce their air quality impacts[19].

Figure 1 – NO_x comparison between Road and River

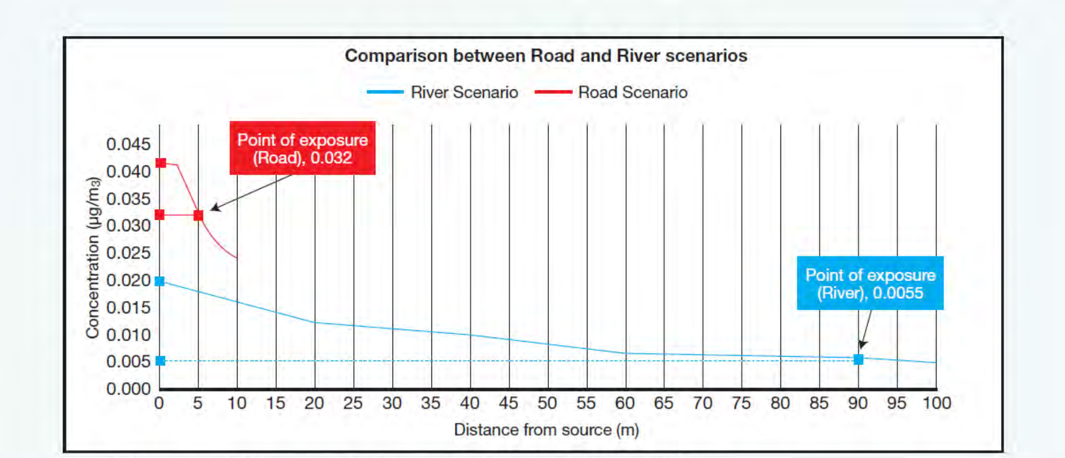


Figure 3: Comparison of NOx exposure from river and road sources (Freight Scenario 2)

- ***Improves road safety***: road freight causes a number of accidents in London each year: the number of fatal and serious injuries in collisions involving HGVs per vehicle kilometre travelled in London was 40 per cent lower in 2012 than the 2005-2009 annual average; for LGVs (delivery vans) it was 9 per cent higher [20]. The increase in accidents involving LGVs can predominantly be explained by the increase in distance travelled by LGVs. On the river, the Port of London Authority (PLA) collects health and safety statistics for river transport which show continuing performance improvements[21]. Evidence from London highlights that additional use of the river replacing road freight, would increase cyclist and pedestrian safety, and help support the ambitious aims of The Mayor's Transport Strategy[22] .

- ***Productivity in extreme weather:*** In February and March 2018, bitterly cold weather engulfed the UK and most of Northern Europe – it became known as the "beast from the east". The cold weather and snow caused severe disruption to travel and freighting due to gridlocked roads and cancelled trains. Best estimates indicate the extreme weather cost the UK circa. £1 billion per day in lost economic output[23]. Cory's operations on the River Thames continued unperturbed, demonstrating the resilience of water freight operations, in even the most extreme circumstances. Looking forward, Britain's freight network needs to be resilient in the face of future extreme weather conditions, which are predicted to increase as our climate changes due to global warming. Policymakers must not overlook the contribution a modal shift to utilising river freight could make to improving resilience.

[19] PLA. Draft Air Quality Strategy. See here
[20] TFL London freight data 2014 update. http://content.tfl.gov.uk/london-freight-data-report-2014.pdf
[21] PLA Annual report of the Marine Safety Management System (SMS) performance and incident statistics 2016. https://www.pla.co.uk/assets/smsannualreport2017.pdf
[22] See page 62 of Mayor's Transport Strategy, Draft for public consultation, June 2017.
[23] https://www.theguardian.com/uk-news/2018/mar/03/freezing-weather-storm-emma-cost-uk-economy-1-billion-pounds-a-day

CORY
RIVERSIDE ENERGY

Canal & River Trust

NATIONAL INFRASTRUCTURE COMMISSION FREIGHT STUDY CALL FOR EVIDENCE CANAL & RIVER TRUST RESPONSE

08 March 2018

Introduction to the Canal & River Trust

The Canal & River Trust is a company limited by guarantee and registered as a charity. The Charity was launched on 2nd July 2012 taking over responsibilities from British Waterways and the Waterways Trust in England and Wales.

The creation of the Trust is the largest conversion of a public corporation into a registered charity. Under the transfer of functions:

(1) local planning authorities and the Planning Inspectorate are now required to consult the Canal & River Trust on applications for planning permission / development consent orders in the same way as British Waterways were previously consulted;

(2) all the operational and investment property of British Waterways in England and Wales has now vested in the Trust (c. £780m in 2016/17; and

(3) all the statutory duties of British Waterways in England and Wales have been transferred to the Trust - to maintain the safety and structural integrity of waterway infrastructure, water supply, discharges and drainage, waterway management and maintenance operations, including maintaining water levels for navigation purposes; to protect and safeguard the natural environment, landscape character and built heritage of waterways; as well as to encourage public access to and recreational use of the inland waterways.

The Trust cares for an extraordinary collection of waterways in England and Wales, holding them in trust for the nation in perpetuity. This includes 2,000 miles of working canals and river navigations, docks and 72 reservoirs; the third largest collection of listed buildings and structures in the UK (c.2,700 in total) and 500 miles designated within conservation areas; 63 Sites of Special Scientific Interest; over 1,000 wildlife conservation sites; one World Heritage Site and a further four contributing to UNESCO world heritage sites as well as the national waterways collection and archives and its museums.

Our waterways offer easily accessible activity and recreation, for quiet contemplation, health and wellbeing. The Trust and our waterways support wider economic regeneration, educational, health and tourism benefits close to where people live and work. Over 50% of the population of England

and Wales live within 5 miles of one of our waterways and many of those people live among the most deprived communities in the UK.

The Trust is proactive in utilising its property assets and joint venture vehicles to bring forward land to deliver regeneration, wider benefits to the community and to attract private sector investment. As a charitable body, all net rental income and capital receipts generated from our property estate and other commercial activities are used to maintain the waterways and ‘Transform Places and Enrich Lives’.

The Trust’s network of Commercial Waterways

Of particular relevance to this consultation is the network of commercial waterways owned and operated by the Trust. Currently these are under used transport routes that provide opportunities for freight access into our overcrowded and congested cities.

Our network comprises ten commercial waterways with the heart of this network being the waterways serving the Humber estuary. Most are in Yorkshire and the north Midlands, feeding the Humber estuary - the Aire and Calder Navigation (A&CN) and its branches, the Sheffield and South Yorkshire Navigation (SSYN), the River Ouse and the Tidal Trent. Elsewhere there is the Gloucester and Sharpness Canal, and the River Severn Navigation upstream from Gloucester; the Weaver Navigation in Cheshire; and the Lee Navigation, from Hertford almost to the Thames at Bow.

The Trust is passionate about developing these waterways as key freight transport routes and would welcome the opportunity to discuss these in more detail with the NIC.

We have a waterborne Freight Policy and this can be found here: -

https://canalrivertrust.org.uk/media/original/6213-a-proposed-strategy-for-waterborne-freight.pdf?v=96c75f

And there is further information on our website here

https://canalrivertrust.org.uk/about-us/planning-and-design/planning-policy/the-values-and-benefits-of-waterways/environmental-wellbeing/sustainable-transport-and-waterborne-freight

The plan below shows the Trust's network of commercial waterways.

Our responses to the NICs Questions

The Trust notes that the questions posed by the NIC seem to be directed towards towards the issues associated with road and rail freight. We have responded to the relevant questions from a waterborne freight perspective.

The questions the Commission is particularly keen to focus on in this initial phase of work are as follows. You may wish to respond to all or any of the below:

1. **What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?**

1.1. What do you see as the key drivers to a successful freight system that is fit for the future?

The key drivers for a successful freight system include a system that makes best use of the available transport routes, well connected and well-maintained routes, the optimisation of modal shift opportunities, route resilience and a coordinated approach to freight that ensures the best level of service to freight customers.

1.2. Which are the key freight corridors that matter the most? Where are the bottlenecks in the freight network, and what investments in upgrades could deliver the best value for money for freight efficiency and UK plc?

From the Trust's perspective, the key freight corridors are as follows

- From the Humber Estuary into the Leeds area
- From the Humber Estuary to Sheffield and Rotherham
- From the River Thames to North East London and beyond.

1.3. To what extent are the economic benefits of freight factored into wider transport infrastructure investment planning?

The Trust believes that the economic benefits of waterborne freight are not always factored into infrastructure investment planning. There are several reasons for this including a lack of knowledge of waterborne freight opportunities and the fear of the unknown (ie use of waterborne freight when compared with road freight), and concern over the degree of capital investment required. The Trust has met several developers who, although interested in developing waterborne freight have eventually decided upon other options.

The Trust believes that there needs to be some degree of central coordination of waterborne freight to ensure that opportunities are acted upon with regional coordination of resources, rather than expecting individual projects or developers to underwrite the capital investment required. The Trust feels that this regional coordination role should be undertaken by Transport for London in the South and Transport for the North in the North.

1.4. What are the regulatory and legal issues that, if changed, could improve freight efficiency without increasing costs or reducing efficiency?

2. **How might the demand for freight develop and change over the next 20-30 years?**

2.1. How has the demand for freight, and types of freight, changed over the last two decades, and what will be the drivers for changes in the future?

Although waterborne freight tonnages are falling the Trust is seeing a healthy interest in inland waterway freight. There is a particular interest in the waste and recycle sectors which are particularly suitable to canal barges which are essentially bulk carriers. We also seeing a healthy demand for sea dredged aggregates and there is a real opportunity here for these to be transported via water from the Humber Estuary into the ports at Goole and the proposed Port of Leeds.

2.2. How is the freight industry planning for future changes in the demand? What levers might be available to shape future demand for freight transport?

The Trust sees the forthcoming HS2 project in the Leeds area as having the potential to creating an opportunity to deliver the necessary infrastructure to promote waterborne freight in the North of England.

As stated above the Aire & Calder Navigation is a commercial waterway (i.e. a waterway which, under the Transport Act 1968, is to be principally available for the commercial carriage of freight). It connects to the Humber Ports and has been identified by the Trust as a Priority Freight Route. The Leeds City Council Adopted Natural Resources and Waste Local Plan safeguards some wharf sites for unloading to protect the ability to use the canal for freight. It also allocates a site for a new wharf site and associated employment activities in the Stourton area. The Trust has obtained planning permission for change of use of the land to provide for the storage and distribution of aggregates with associated provision of a wharf.

The site at Stourton is adjacent to the proposed HS2 Eastern Leg Rolling Stock Depot. This provides the opportunity for water transport to be used in the delivery of materials, such as aggregates and steel, to the site during both the construction and operational phases. In addition, the site can also be used for the transhipment of waterborne freight from the Humber area for onward distribution, and could provide a lasting legacy for waterborne freight in the area. We are currently in discussion with HS2 Ltd about the opportunities here and would be happy to assist in exploring such opportunities with the NIC.

Away from HS2, the Trust sees a growth in containerised freight and is working to ensure that any future crossings of its waterways provide sufficient navigational headroom to accommodate this. There are very few crossings where the existing headroom is lower than that required for containerised freight meaning that with a modest capital investment to address these allowing our commercial waterways to unlock the potential for the waterborne transport of containerised freight into key northern towns and cities.

As a rough guide, our commercial waterways have the capacity to transport the following tonnages of freight: -

- Aire & Calder Navigation – 10 Million tonnes per annum (Mt/pa)
- Sheffield and South Yorkshire Navigation – 8 Mt/pa
- River Ouse – 5 Mt/pa

3. **What effects does congestion have on the efficiency of freight movement and emissions?**

3.1. How does congestion impact upon the productivity and economic contribution of freight? To what extent does congestion affect changes to mode, time or other freight choices?

Congestion can have a major impact on the productivity of a freight distribution network and opportunities that have the potential to reduce congestion should be explored as alternatives to existing routes, or as a “back up” to existing routes. The Trust’s network of commercial waterways is largely congestion free and offer the opportunity to gain access to city centres such as Leeds and London by avoiding large portions of the road network. We would be happy to talk further with the NIC about these opportunities.

3.2. How does congestion affect the environmental impacts of the movement of freight?

3.3. With limited space for new infrastructure, how can we better use our existing urban network to support freight? Are there changes – such as changes to modes, methods, or delivery times - that could help reduce the stress on the urban transport network?

The underused and often congestion free commercial inland waterway network could certainly be used to supplement existing infrastructure. The network is in place and ready to go, needing a modest investment in new and upgraded wharfage, lock automation, some dredging and vessel improvements.

The big advantage of upgrading the commercial waterway network over, say the construction of new roads and railways, is that there is no need to build new “track” as it is already there, meaning that the benefits of the commercial waterways could be realised much sooner than the decades long timescales for major infrastructure projects such as Crossrail, HS2 or major motoways.

The Trust is encouraged to see the upgrading of the Aire & Calder Navigation recommended in the recently published “Freight and Logistics” Report by Transport for the North – see link below: -

https://www.transportforthenorth.com/wp-content/uploads/TfN-Freight-and-Logistics-Report.pdf

(Refer to Section 6.2.2 and Table 8.1)

We feel that further endorsement by the NIC to these recommendations would be extremely helpful in identifying funding sources etc.

4. **How can freight lower its carbon and air quality impacts?**

4.1. Are there efficiencies within freight management and distribution practices that could help reduce the CO2 and NOx emissions from freight?

Waterborne freight offers a significant opportunity to reduce the environmental impact of freight transport. The information in the table below (Source: Commercial Boat Operators Association) gives an indication of the environmental benefits of waterborne freight.

INDICATOR	WATER	RAIL	ROAD
Tonnes moved one km with one litre of fuel	127	97	50
Energy used per tonne km (in mega joules)	0.2MJ	0.4MJ	0.8MJ
CO2 pollution to move a tonne one km	25g	41g	160g
Cost to the environment as a percentage of the total cost (takes into account pollution,noise,congestion,delays,climate)	0.5	2%	92%

4.2. What role do alternative fuels such as electricity, Liquid Petroleum Gas and biofuels have to play? What are the barriers and challenges to wide-scale uptake of alternatives to diesel and what could be done to help remove these issues?

Environmentally friendly propulsion technology for inland waterway vessels is improving all the time. We are aware of many examples of such around Europe at the moment, including the use of Hydrogen, batteries, and LPG. There is no domestic funding for this at the moment though. There are EU grants, but the long-term future of this funding is unknown. UK Govt does not appear to invest enough in innovation in the Freight sector, and certainly not around inland waterways.

Emerging technologies such as the electrification of powertrains should be investigated for adoption by the waterborne freight sector. For example, Tesla is now producing electrically powered HGVs demonstrating that this technology can be applied to “heavy duty” situations and is not just limited to cars and vans. For example, an electrically powered barge could recharge its batteries while passing through a lock and whilst loading and unloading.

4.3. What technologies could best and most realistically be utilised to manage the carbon impacts of freight, both within urban areas and on longer strategic journeys?

The Trust believes that the following technologies could allow the carbon impacts of freight to be reduced. However, it is essential that the necessary investment is provided to allow them to reach their true potential: -

- Electricity – powering motors directly from battery packs and/or hybrid powertrains
- Hydrogen – generating electricity to power motors and/or hybridpowertrains
- LPG

5. **How could new technologies be utilised to increase the efficiency and productivity of UK freight?**

5.1. How will new technologies change the capacity and performance of the freight transport network? Over what timeframes might these new technologies begin to affect the freight transport network?

The Trust sees that many applications of existing technology could be employed on the commercial waterway network to improve productivity, efficiency and safety. These include: -

- “Smart Locks” – locks that detect incoming craft and set themselves ready (full or empty, with the relevant gates open) so that the time taken for the passage through the lock can be minimised.
- Autonomous craft – the Trust sees this as a development of the technology being used to develop autonomous vehicles

These technologies could be implemented in the short to medium term (next 5 – 10 years)

5.2. How can the use of data such as real-time traffic information by artificial intelligence and machine learning systems help to improve freight efficiency and productivity? How might this affect the business models and requirements of freight in the future? Are there any barriers to the greater use of data in freight?

5.3. How do you see technologies such as HGV platooning, digital railway signalling, and autonomous vehicles being integrated into freight distribution?

5.4. How might regulations and physical infrastructure need to adapt to new technologies and business models in the freight sector?

6**. Are there good examples internationally of freight systems, policy, infrastructure or technology development and implementation that the UK can learn from to increase freight efficiency and/or reduce the carbon and congestion impacts?**

For further information please contact

[Name redacted]
[Job title redacted]
Canal & River Trust
First Floor North, Station House
500 Elder Gate
Milton Keynes
Buckinghamshire
MK91BB

Tel: [Telephone number redacted]
Email: [Email address redacted]

National Grid Response to National Infrastructure Commission's Freight Study Call for Evidence - March 2018

Overview

Employing around 7,000 people in the UK, National Grid is the owner of the high-voltage electricity transmission system in England and Wales, and the owner and operator of the national gas transmission system across Great Britain. As the System Operator (SO), for both gas and electricity in Great Britain, we are responsible for balancing supply and demand in the short term for the whole transmission system.

Heavy goods vehicles (HGVs) are disproportionate emitters of air pollutants. They are estimated to account for around 17 per cent of UK greenhouse gas (GHG) emissions from road transport and around 21 per cent[1] of road transport NO_x emissions, while making up just 5 per cent of vehicle miles. It is vital that Government and industry collaborate on solutions to enable cleaner, greener alternatives to diesel-fuelled commercial vehicles.

At National Grid we are pleased to play our part in enabling the use of gas for transport. The existing UK gas networks provide access to the cheapest, cleanest and most reliable source of CNG. We see an important role for gas, in the reduction of air pollutant emissions and the decarbonisation of freight.

Looking further ahead, the opportunity from hydrogen is great. Fuel cell vehicles (FCV) use hydrogen as a fuel source and there have been investigations into whether hydrogen could be added to natural gas in transmission systems. Combustion of hydrogen produces no carbon dioxide, so if it can be produced without causing carbon dioxide emissions it could be very useful in assisting decarbonisation. Commercial viability of FCVs will be assisted further by the move to a hydrogen economy, and National Grid is positioning itself to ensure it can be a facilitator to cleaner and decarbonised transport. Our Future Energy Scenarios project that hydrogen will be readily available by 2050, and fuel cells will become a popular choice for powering HGVs, buses and vans.

1. How can freight reduce its carbon and air quality impacts?

1.1. Enabling Compressed Natural Gas (CNG) and Liquefied Natural Gas (LNG) for HGV's

1.2. HGVs are replaced typically every three to five years. This presents an opportunity to bring about change by moving to gas alternatives within a short time period, without blocking investment and research and development in zero emission alternatives.

1.3. Gas is the only commercially viable alternative to diesel for HGVs today and we ask that Government make it an immediate priority to support proven gas technologies for commercial vehicles, while zero emission alternatives are being developed. Recent conversations with the freight industry suggest commercial viability from the 2030s at the earliest.

1.4. By using gas as a primary fuel for freight we can expect reduction of NOx emissions by 41 per cent, NO2 by 74 per cent and particulate emissions by up to 96 per cent. If biomethane is used we could see well-to-wheel greenhouse gas emissions reduce by 84 per cent (15-21 per cent if natural gas[2]). A recent study by Cadent quantifies the theoretical potential for

[1] Energy Technologies Institute, Natural Gas Pathway Analysis for Heavy Duty Vehicles, http://www.eti.co.uk/library/an-eti-perspective-natural-gas-pathway-analysis-for-heavy-duty-vehicles
[2] Element Energy, Independent assessment of the benefits of supplying gas for road transport from the Local Transmission System, 2017 https://cadentgas.com/getattachment/About-us/Innovation/Projects/Revolutionising-Transport/Promo-Full-report/Element-Energy-Monitoring-of-Leyland-station-final-summary.pdf

biomethane at over 100TWh per year, an amount which could cater for the entire HGV fleet[3]. There are also wider societal benefits including reducing noise by ~50 per cent (3dB) compared to even the newest EuroVI diesel HGVs[4].

1.5. Natural gas vehicles are commercially viable today and while some investment will be required in connection and refuelling infrastructure, there is no direct public spend required. While there are limited numbers of CNG filling stations connected to the gas grid today, the private sector is willing to invest, as the economic case is there for investment. This is largely due to a fixed fuel-duty differential out to 2024 which makes natural gas ~40 per cent [5]cheaper than diesel, from which the economic benefits trickle throughout the gas refuelling value chain. We recommend that the Government extends the fixed fuel-duty differential beyond 2024.

1.6. To further incentivise the shift to a cleaner freight sector, government and local authorities could look to implement measures to drive greenhouse gas (GHG) benefits via the deployment of clean air zones.

<u>Enabling new connections to gas grid</u>

1.7. We have been pleased to play a role in pioneering use of CNG in HGVs via a filling station in Leyland, Lancashire, developed by our former gas distribution network (now Cadent). This has been used by the John Lewis Partnership as fuel for its vehicles.

1.8. While CNG can be taken off the gas network at either transmission or distribution level, there is further benefit in enabling CNG offtakes at the ~70 bar National Transmission System (NTS), in order to minimise the need for costly and energy-intensive compression.

1.9. As the low carbon freight market develops and we see an increase in uptake of gas fuelled HGV we envisage there will be greater demand for direct CNG connections to the transmission and distribution network. National Grid is proud to innovate in the area of enabling new connections to the existing gas grid. We are cutting the time and cost for potential customers to connect to our gas transmission network via our "Project CLoCC - Customer Low Cost Connections". Making CNG more available via our network will make it easier for more companies to convert freight vehicles from diesel. We stand ready to enable new connections to the gas grid.

1.10. There are currently a number of barriers to greater uptake of gas for freight. Industry is working with government to address the following: independent gas HGV performance trials to prove GHG emission reductions from the latest models; extension of the fuel-duty differential; tiered vehicle excise duties/levies; and gas HGV Ultra Low Emission Vehicle (ULEV) classification for access to Clean Air Zones.

1.11. We have been pleased to facilitate industry roundtable meetings to address some of these issues, and are working closely with the Department for Transport, gas producers and distributors, vehicle manufacturers, fleet operators and station providers in the development of an industry roadmap for gas in transport.

1.12. In addition to enabling the use of CNG via our networks, through our standalone commercial arm, we also operate the only UK liquefied natural gas (LNG) tanker loading facility at our Isle of Grain site. This allows operators to load LNG to transport it to filling stations, or to industrial and commercial customers for use with their fleet.

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[3] Cadent, Review of Bioenergy Potential, September 2017 https://cadentgas.com/about-us/the-future-role-of-gas/renewable-gas-potential

[4] Iveco's Alternative Fuels Director UK and ROI – presentation to an REA conference http://www.r-e-a.net/upload/Martin_Flach.pdf

[5] LoCITY Infrastructure Roadshow – CNG Fuels Presentation https://locity.org.uk/wp-content/uploads/2017/05/LoCity-Gas-Roadshow_21.09.17_-INFRASTRUCTURE.pdf

1.13. LNG tends to be the preference for frequent long-haul use, due to its higher fuel density enabling longer range driving (beyond CNG's 800km range): CNG tends to be preferred for moderate usage and urban or mixed urban/rural environments.

Enabling a shift to lower emission fuel for marine freight

1.14. Road transport is not the only area where we will need to map a plan to reduce emissions. To prepare for the new International Maritime Organisation (IMO) regulations, effective from 2020, we're exploring how to supply LNG for marine, for example small-scale marine vessel loading facilities.

CBI response to the National Infrastructure Commission's Freight Study call for evidence

The CBI is the UK's leading business organisation, speaking for some 190,000 businesses that together employ around a third of the private sector workforce. With offices across the UK as well as representation in Brussels, Washington, Beijing, and Delhi, the CBI communicates the British business voice around the world.

1. The Confederation of British Industry (CBI) welcomes the National Infrastructure Commission's call for evidence as the first stage in assessing the future of freight. The CBI will continue to engage in the process to develop a freight strategy which meets the UK's current and future congestion concerns, capacity needs and carbon obligations.

2. Assessments of the transport sector have seen little focus on freight, despite it underpinning the modern economy and being vital to the movement of commercial goods, both domestically and internationally. The UK's logistics sector contributes over £121 billion Gross Value Added (GVA) to the UK economy and employs more than 2.5 million people, making the industry key to future growth[1].

3. A priority for the freight strategy should be to recognise the benefits of freight to the whole economy, alongside its importance in delivering on wider policy objectives such as the clean growth strategy, regional growth and international trade. The strategy should also recognise the diversity and interconnectivity of freight, and critically analyse the need for improved capacity to meet future demand as well as how the UK's existing capacity can be used most efficiently to ease congestion and support emissions reduction.

4. The Commission's focus on this area of transport infrastructure is important and very welcome. Business seeks an ambitious strategy, with the aim of making the UK as competitive, productive, connected and sustainable as it can be. This response argues that the National Infrastructure Commission's study into freight must:

    - **Recognise freight as a vital component of the UK economy and its role within the wider infrastructure system**
    - **Consider the capacity improvements needed, as well as how to maximise efficiency across modes of transportation**
    - **Fully consider the opportunities and challenges in the decarbonisation of freight**

Recognise freight as a vital component of the UK economy and its role within the wider infrastructure system

5. Freight is critical for the movement of goods around the country and to the UK's trading partners, with billions of tonnes being transported by road, rail, sea and air every year. It is important that an assessment of the UK's freight system recognises this crucial function, but also looks beyond these benefits to the wider impact that freight has on the UK economy. With the annual turnover of logistics (rail, road, sea and air) at £1 trillion and employment levels accounting for 8 per cent of the workforce, the sector is crucial to competitiveness and growth of the overall UK economy[2]. The economic value

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[1] FTA. *A logistics agenda for a safer, greener and more prosperous Britain*. May 2017.
[2] FTA. *A logistics agenda for a safer, greener and more prosperous Britain*. May 2017.

created is wider still, with recent data showing logistics contributing to £301bn value of goods exported and £436bn value of goods imported from the EU and non-EU countries, making the UK a global leader in logistics, ranking in the World Bank's top 10 countries[3]. The study on freight must therefore recognise the global nature of freight and its contribution to the UK economy, particularly through exports, jobs and economic growth.

6. Furthermore, the freight study must not view freight in isolation, but consider its interconnectivity within the transport system and its role in wider infrastructure delivery. Goods of course often move between different modes of transport when going from A to B. The movement of mineral products is one such example of the seamless integration of freight, whereby at point of production aggregates are transported by rail into urban areas for onward distribution by Heavy Goods Vehicles (HGVs) or barge. A more coordinated approach within the intermodal freight supply chain therefore has the potential to make freight more efficient, competitive and sustainable. Freight is also highly integrated with the UK's infrastructure system. From building the homes we need, to keeping our power stations running and removing waste from our cities; the UK's road and rail transport infrastructure plays a vital role in ensuring products move efficiently, whilst UK airports and seaports form an integral part of industry supply chains. It is therefore important that the study analyses the wider implications of freight not only on our transport systems but across the infrastructure project pipeline, including energy, housing and urban logistics. Given the significant contribution of the sector, freight and logistics must be seen as a key enabler, underpinning all segments of the economy, and delivering both regional growth and international trade.

Consider the capacity improvements needed, as well as how to maximise efficiency across modes of transportation

7. The call for evidence rightly acknowledges that the demand for freight has and will continue to alter over the coming decades. Road remains the dominant mode of transport for freight domestically, with just over just over 76% of all goods moved by road [4]. Furthermore, changing patterns in consumer demand have seen the growth of online shopping, with online sales accounting for 16.5% of all retail spending in 2017[5], and business to business commerce disrupting supply chains. This has resulted in a rise in road freight, with van mileage growth forecast to be 79% of the overall traffic mix traffic by 2040[6], and by virtue an increase in congestion, particularly in urban areas. Estimates predict the cumulative cost of congestion to be £307 billion and vehicle idling releasing up to 17,959 kilotons of carbon emissions in the UK between 2013 and 2030[7]. With these economic and environmental impacts in mind, easing congestion is a priority, with the aim of improving supply chain capabilities, reducing emissions and improving business profitability.

8. In assessing freight, firms highlight continued investment in road as vital to maximising network capacity. In response to the CBI/ AECOM Infrastructure Survey 2017[8], businesses saw road delivery as a top transport priority for this parliament, with 35% of businesses seeing delivering the current Road Investment Strategy (RIS) and 34% seeing delivering improvements to the local road network as critical. Roads are central to freight distribution through their ability to move goods and services regionally as well as globally, by providing connections to our air and sea ports. As a result, business sees investment in the strategic road network, which currently moves more freight than all other roads and transport

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[3] The World Bank. *Global Rankings, Logistics Performance Index*. 2016.
[4] DfT. *Road freight statistics*. July 2017.
[5] ONS. *Retail Sales in Great Britain*. January 2018.
[6] RAC. *The Implications of Internet Shopping Growth on the Van Fleet and Traffic Activity*. May 2017.
[7] CEBR. *The future economic and environmental costs of gridlock in 2030.* July 2014.
[8] CBI/AECOM. *Infrastructure Survey Foundations for Growth.* October 2017.

modes combined[9], as fundamental to the success of freight. This investment must also extend to the wider road network which is critical in delivering seamless end to end journeys including that of the last mile. The study into freight must therefore recognise the importance of an integrated transport network in the efficient movement of freight and the need for investment in infrastructure to ensure capacity is utilised to deliver best value for the UK economy.

9. While improving the UK's road capacity and resilience is of critical importance, firms also see that there is an opportunity to better maximise the efficient use of the UK's overall freight capacity. In particular, business sees the transfer of freight from road to rail where appropriate on key strategic corridors as one viable solution to maximising capacity. Better leveraging rail freight not only has the potential to increase capacity through its ability to transport bulk goods but also through its role in the intermodal movement of consumer goods, delivering productivity gains for UK businesses and congestion and environmental benefits totalling over £1.5 billion per year[10]. Given the significant contribution rail makes, and can continue to make, to the wider objectives of freight, the study must both fully address all issues that impact rail growth and understand where gains can be realised from rail connectivity.

10. Businesses also see a future-fit system recognising the role of developing new or alternative freight transport modes, such as inland waterways. As it stands, 95% of UK imports and exports are transported by water[11], however, 15% of this traffic is domestic cargo travelling around the coast. Water freight not only has the potential to reduce congestion and improve air quality but can offer important advantages such as enabling goods to be delivered closer to markets and barges carrying loads nearly 50 times greater than that of one HGV. An analysis of freight movement should consequently recognise the role that water freight can play and evaluate the benefits from maintaining positive multi-modal initiatives across industry.

11. Firms also want to see a future freight strategy take full account of the role that aviation plays in freight, and the importance of increased capacity, as well as maximising the use of existing capacity. Air freight is a cornerstone of the UK economy and critical to the competitiveness of UK industries where goods are perishable or high value to weight. Whilst rebalancing to other modes of transportation may not be a viable solution for air, with airports key freight hubs for regions and sectors, connections between them and the wider transport network will also be important to meeting future demand.[12] The CBI supported the conclusion of the independent Airports Commission, subsequently agreed by the government, which said that the north-west runway at Heathrow presents the strongest case for airport expansion in the South East, and will offer the greatest strategic and economic benefits for the whole of the UK. It's now more critical than ever that the National Policy Statement is taken forward in a timely way to allow construction to begin by 2020, and a new runway to be operational before 2030. Furthermore, businesses across all regions cite the need for a long-term aviation strategy which works for all parts of the country; making full use of existing capacity whilst enabling regional airports to develop their own unique identity and competitive advantage in addition to fulfilling a wider strategic role for UK plc. The study into freight must therefore consider the future of aviation within a fully integrated transport system and its role in ensuring the UK's long-term capacity needs are met.

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[9] Highways England. *Strategic Road Network Initial Report*. December 2017.
[10] Rail Delivery Group. *Continuity and Certainty for Rail Freight*. 2015.
[11] FTA. *Growing the UK inland water freight sector: lessons from the Thames*. July 2016.
[12] CBI. *Response to the Department of Transport's Aviation Strategy call for evidence*. October 2017.

Fully consider the opportunities and challenges in the decarbonisation of freight

12. Businesses welcome the vision for clean growth and agree on the importance of developing an efficient and low carbon freight system to support this. Currently, domestic transport emissions account for nearly a quarter of total UK emissions, with HGVs estimated to make up around 17% of road transport carbon emissions and around 21% of road transport NOx emissions. Developing a decarbonisation strategy for freight is therefore crucial for the sustainable growth of this sector.

13. Whilst the decarbonisation of freight poses its challenges firms agree, as set out in the Freight Carbon Review[13], that there are a range of existing practices and policy options to cut carbon and improve air quality. As highlighted in this response these should include, but not be limited to, the greater utilisation of rail networks, with technical changes such as electrification amplifying environmental benefits, and the use of urban logistics hubs where deliveries can be consolidated to reduce road miles. Firms also note the potential for electric vehicles and alternative fuels to decarbonise the sector, however raise the need for developments in sustainable fuels to be matched with investments in infrastructure. With this in mind, business eagerly anticipates the outcomes of the Government's Future Fuels for Flight and Freight Competition[14] and Aviation Strategy to provide certainty in the short to medium term. In evaluating the decarbonisation strategy, the study should thus look first to how existing practices can lead to effective use of current capacity while also setting a long-term vision for freight.

14. The call for evidence rightly connects the development of new technologies with the potential to not only increase the efficiency and productivity of freight but also lower carbon and air quality impacts. Businesses acknowledge that the economic and environmental benefits of modernisation are considerable, particularly in overcoming the challenge of the last mile which is the least efficient stage in terms of time, emissions and congestion. Furthermore, leveraging advances in technology such as connected autonomous vehicles and digital signalling could optimise movements of freight as well as identify spare capacity within the transport network. Whilst such developments could be transformational to the sector, firms highlight the need for an integrated approach to be taken so that technologies are efficiency embedded across the infrastructure system. In shaping the future of freight, the study must therefore recognise the interconnectivity of freight and consider policy issues holistically across regulatory bodies and geographies to ensure maximum efficiency from technological advancements.

15. Business recognises that to tackle congestion and capacity policy measures must be implemented at both a local and national level. This will become increasingly important in the drive towards improving UK air quality with the implementation of clean air zones throughout our towns and cities. However, firms highlight the need for certainty to plan, and consistency in policy, to make such investment decisions in freight, given procurement cycles and high asset life. The transition to the Euro 6 standard for clean air zones is one such example of this, where inconsistency across local authorities could result in additional costs for those that operate across them. Firms consequently look to foresight of government policy to inform investment decisions and as such eagerly anticipate the government's upcoming Road to Zero and Future of Mobility strategies for further clarity on the decarbonisation of freight. A future fit freight strategy must therefore ensure a consistent approach to freight and explore synergies with national objectives for clean growth.

CBI People and Infrastructure Directorate, March 2018

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[13] DfT. *Freight Carbon Review 2017.*February 2017.
[14] BEIS. *The Clean Growth Strategy.* October 2017.

National Infrastructure Commission – Call for Evidence – Freight Study
Transport for the North Response

Introduction

TfN has studied freight movements across road, rail, air, sea and inland waterway. This has been achieved by research, modelling and analysis of freight flows to give a picture of the existing markets and identifying future growth based on the assumptions published through the Northern Powerhouse Economic Review. This meant that the impact of growth outlined in that review, delivering an additional 850,000 jobs and GVA benefit of £100bn was analysed against the current market activity.

Transport for the North (TfN) has already shared its Enhanced Freight and Logistics Analysis Report with the National Infrastructure Commission. This response should be read in conjunction with the report which will add detail and context to the thoughts outlined here. The Enhanced Analysis was published alongside the consultation draft Strategic Transport Plan.

The main challenge with working within Freight and Logistics from a centralised point is that the actors within the industry are private sector. This adds a commercial complexity to the work, requiring a sensitive approach to be taken.

One key Transport for the North success is the identification of the Major Road Network which is made up of roads that appear in Highways England's Strategic Road Network. Additionally, it includes roads that have been shown to have key economic importance in connecting the prime capabilities of the North as identified in the Economic Review. Transport for the North are also developing the Northern Powerhouse Rail Programme which has freight as a

Questions set by National Infrastructure Commission

1. What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?

The key constraints to the effective movement of freight in the North and beyond mainly concerns congestion and lack of options for the movement of people and vehicles on an east west axis. The North South flows on the A1 and M6 for road and the East and West Coast mainlines (ECML and WCML) for rail have received significant investment (the ECML in comparison to the WCML has not received the same levels of funding).

On the road it is the sheer volume of traffic both cars and lorries that require access to use the infrastructure. Road haulage is seen as an attractive way of moving goods and materials because it is free at the point of access and is not timetable driven in the same way as the rail network is.

Journey time reliability is a key issue for the North of England. Without a resilient and reliable network, the freight sector suffers in terms of lead times for delivery, collection of stock, Just in Time delivery concepts and more. Overall, this is because of congestion.

There is also a lack of direct rail paths between freight hubs which lengthens journey times and reduces efficiency.

In terms of overcoming infrastructure limitations, Transport for the North is conducting Strategic Development Corridor Studies. The results of these studies, worked through with partners, will inform the Strategic Outline Programme of investment activity TfN will use to formally discuss investment priorities with our Statutory Partners and the Secretary of State. The evidence that underpins the corridor studies is wide ranging. Partner input and Transport for the North commissioned evidence is all considered carefully.

1.1. What do you see as the key drivers to a successful freight system that is fit for the future?

Transport for the North has forecast the passenger rail usage to increase by over 400% by 2050. Northern Powerhouse Rail will deliver significant journey time improvements between the major Northern cities coupled with increased capacity for more passengers to travel. TfN would like to see any benefits on the network strengthen opportunities in the freight market.

The actual impacts of driverless vehicles in the passenger car market have yet to be fully understood. It could encourage people to remain in their vehicles rather than use the rail network because the journey experience in a car becomes more like rail leaving all the car users to be free to work, take phone calls or be with friends and family enjoying the journey together without the driving responsibility.

However, if there is a reduction in car usage as alluded to earlier, then the road network will be more resilient to disruption. This will be strengthened by the delivery of programmes of investment delivered by partners following the publication of Transport for the North's Strategic Transport Plan.

Other issues considered through TfN's Enhanced analysis include:

- Skills shortage and ageing workforce
- New technology to improve utilisation of vehicles – reduce empty running
- Understanding supply chains and how they are structured
- Improved planning process which encourages a more sustainable freight operation which is closer to transport corridors and interchanges
- Constriction of Strategic Rail Freight Interchanges

1.2. Which are the key freight corridors that matter the most? Where are the bottlenecks in the freight network, and what investments in upgrades could deliver the best value for money for freight efficiency and UK plc?

The key freight corridors that matter the most are focused on enhancing East West connectivity. This will enable increased freight flows from Tees Valley to the North West and enhance linkages from all the Eastern ports to the Western ports. Also, the growth in the energy sector in Cumbria with the new nuclear power plant and the opening of the West Cumbria mines is significant. Coal flows are expected to be going to the North-East ports which adds weight to the east west links being strategically important. The Humber's relationship with the Irish markets is also significant and could be strengthened with increased connectivity and investment. East West links on the road network are also critical with other options required to improve resilience of the M62.

When the development at Liverpool 2 secures its first container vessel (which is expected soon) then the volume of container freight will significantly increase from there. Therefore, the schemes that are important to TfN to be highlighted through Network Rail's North of England Route Study include the priority to enhance infrastructure out of Port of Liverpool and in Cumbria.

Other issues considered within TfN's Enhanced Analysis include:

- Gauge clearance on the rail network provides bottle necks – links from ECML to Tees ports are impacted by gauge issues at Northallerton and Yarm. Ensuring gauge cleared routes from ports to main freight hubs will have a major benefit.
- Lack of Trans Pennine connectivity by rail is critical – need improved freight path availability across the Pennines.
- Lorry parking should be identified as a national priority. Lack of safe parking areas impacts on the wider network and communities as areas can be blighted by inappropriate HGV parking and the associated behavioural impacts this brings.

1.3. To what extent are the economic benefits of freight factored into wider transport infrastructure investment planning?

Traditionally the economic benefits of freight do not appear in the current appraisal process. However, Transport for the North is developing a modelling and appraisal technique that includes freight within the assessment of future programmes currently in use with the Strategic Development Corridor process. Also we are working closely with the Department for Transport to share learning in this area.

We have to utilise the Great Britain Freight Model (GBFM) to comprehensively consider the economic benefits of freight because this is the only current approach that utilises data covered by all modes of freight and on a global basis. This is a monopoly on understanding freight flows and places significant costs on organisations seeking to plan for the future.

1.4. What are the regulatory and legal issues that, if changed, could improve freight efficiency without increasing costs or reducing efficiency?

Most operators within the freight sector work within a licensing system that is highly regulated. There are exceptions for smaller vehicles under 3.5 tonnes. If some of the regulatory activity could be streamlined but not lose any of the safety elements then this could be advantageous to the industry. Additionally, the legal framework for the operation of autonomous vehicles and ships needs to be developed and understood.

Other issues considered within TfN's Enhanced Analysis include:

- The impact of longer vehicles on the road capable of carrying more goods to hubs around the UK

2. How might the demand for freight develop and change over the next 20-30 years?

TfN's Enhanced Analysis indicates that there is significant growth on both the road and rail networks between 2016 and 2050. Road is by far the dominant mode for the movement of freight and in 2050 will represent 91% of all cargo tonnes lifted or 88% of all cargo tonne km in the North of England (a growth of 33.1% cargo tonnes lifted or 61.8% cargo tonne km). This will put significant pressure on the existing road infrastructure as the consumer demand for freight increases and will have a negative impact on congestion, regional air quality and costs.

In addition, while the rail freight share is smaller, growth is expected and is driven primarily by the movement of intermodal freight between the Southern ports and the North of England. In 2050, rail is expected to make up 7.3% of all cargo tonnes lifted and 11.6% of all cargo tonne km. This reflects a growth (between 2016 and 2050) of 39.8% and 52.9% respectively. Capacity on the rail network for freight is a key issue, which the projected growth will only exacerbate.

Other issues considered within TfN's Enhanced Analysis include:

- Changing consumer habits with more services delivered online it has changed traditional supply chain model
- Changing trading relationships will impact on trade and Brexit tariffs which could change investment decision making from manufacturers
- Changing energy technology with the use of green energy and sustainable power sources

2.1. How has the demand for freight, and types of freight, changed over the last two decades, and what will be the drivers for changes in the future?

In the last two decades the dominant flows have centred on coal for the Electric Supply Industry. Due to government policy change, this has declined significantly. Intermodal flows and construction materials like aggregates have become more dominant in recent years.

The drivers for change in future could include a focus on reducing emissions of all freight from the shipping lines to the rail operators to the road hauliers. There is currently an aging workforce in the freight industry so there is a need to bring forward a new generation of road and train drivers. This will require significant skills development and more people to be aware of and seek opportunities in the industry. If the training and legal requirements could be made more streamlined, this may attract more people into the industry. Also, congestion remains an issue. As congestion increases then the distance that makes mode shift to rail more economically attractive reduces because the railway runs to a timetable and therefore less likely to be stuck in congestion. This doesn't include when an incident happens and the network takes time to recover.

Other issues considered in TfN's Enhanced Analysis include:

- Age of the internet has had a massive impact as the economy has moved away from a more traditional retail economy towards a more internet shopping approach. This has generated more parcel deliveries and vehicle movements
- Just in time manufacture and a reduction in levels of stock held by manufacturers has changed how supply chains are structure. Less stock means delivery of key components on time is more critical.

2.2. How is the freight industry planning for future changes in the demand? What levers might be available to shape future demand for freight transport?

The main lever in terms of shaping future demand is certainty of markets and stability within the economy. If businesses can secure long term contracts that offer certain regular flows on either road or rail then that will shape the future freight flows. Additionally, any development of new technology can enhance opportunities.

3. What effects does congestion have on the efficiency of freight movement and emissions?

Traditionally, heavier congestion increases emissions. New technology in vehicle design could improve this with vehicles not generating emissions when at rest within a queue or even generating no fumes at all. Technology within Euro 6 engines on buses and heavy-duty vehicles generate less NOx than their older counter parts.

When haulage businesses have drivers stuck on the network for extended time periods due to congestion or failure of the network, it can affect the following day's activity. Drivers can't return to their base if they are too far away and have driven for too long and if there are planned staff sessions such as training to attend that has to be rearranged. This adds cost and time pressure onto businesses large and small.

Congestion also has a significant impact on efficiency. This is because there is a reduction in asset utilisation and an increased amount of assets that are needed to deliver an equivalent service. Also with an increased use of assets the levels of emissions are increased because vehicles are operating for longer if they are delayed.

3.1. How does congestion impact upon the productivity and economic contribution of freight? To what extent does congestion affect changes to mode, time or other freight choices?

As the demand for the transport of freight increases, alongside the general demand for transport as the economy grows, congestion is inevitable. Many of the key routes within the North already reach their design capacity at some point during the working day and this issue will be exacerbated in the future.

The Road Haulage Association (RHA) provides costs for different vehicle types in 2014 (see Table 1). These costs consider everything from drivers' wages to the depreciation of the vehicle. The cost data allows conclusions to be drawn on the monetary effect of time lost to congestion over a year to business.

Table 1 - RHA Goods Transport Costs (per average day)[1]

Vehicle Type	2014 Cost (£ per day)	2014 Cost (£ per 15 mins)
Rigid		
3.5 tonne	161	1.68
7.5 tonne	183	1.91
13 tonne	206	2.15
18 tonne	225	2.34
26 tonne	265	2.76
32 tonne	285	2.97
Articulated		
32/33 tonne	273	2.84
38 tonne	303	3.16
44 tonne	325	3.39

The modelling from GBFM forecasts the freight moved in cargo tonnes annually on the road network in the North. Utilising the assumptions in Table 2, an approximate number of annual HGV movements across the North can be calculated. It should be noted that this is a simple test that assumes one vehicle type and a theoretical overall equipment effectiveness (OEE) value. The OEE

[1] http://www.andersonstransport.com/documents/terms/Cost-Tables-2014-EDITION.pdf

assumes that 80% of vehicles are fully loaded and that those vehicles operate at 80% efficiency (i.e. 80% of their maximum load capacity).

The assumption has been made that road movements consist of 60% HGV and 40% LGV movements. This therefore leaves the total capacities for the two modes at 19.2T and 4.8T, respectively.

Table 2 HGV Movements Assumptions

Assumptions	
Vehicle size (tonnes)	44
Max Load Capacity (tonnes)	30
Load Factor	80%
OEE	80%
OEE + Load Factor	64%
Average Vehicle Load (tonnes)	19.2
2050 Cargo Tonnes Moved by Road (tonnes)	763,909,612
2050 HGV Movements	39,786,958

The data presented in
Table 2 shows that in 2050, based on the assumptions set out, there is forecast to be circa 40 million HGV movements on the Major Road Network within the North of England.

Table 3 illustrates the costs to the haulage industry of effects of congestion on the annual HGV movements within the North of England. Varying levels of congestion on similarly varying proportions of the total annual HGV movements generate different costs. If 50% of the HGV movements were caught in 15 minutes congestion every day during the working year, this would equate to an extra cost to the industry (purely time driven as a result of congestion) of £67,347,715. Similarly if 100% of HGV movements experienced 45 minutes congestion every day, the extra cost as a result of that congestion to the industry would be £404,086,292.

Table 3 - Cost of Congestion at varying levels

Time in Congested Conditions (mins)	Cost of varying proportions of HGV Flows in Congestion (£ million)			
	25%	50%	75%	100%
15	33.6	67.3	101.0	134.7
30	67.3	134.7	202.0	269.4
45	101.0	202.0	303.1	404.1
60	134.7	269.4	404.1	538.8

This creates a number of issues however in the context of time and cost that could have repercussions on the cost of goods to the consumer. Manufacturers will simply absorb these costs in the price of the goods to the detriment of the consumer.

Alleviating congestion will not only have a significant impact on the costs of the road haulage industry in the North, it may also attract additional investment from hauliers, which in turn will drive economic growth.

If you reduce congestion it also helps to reduce transport costs which will improve competitiveness of the manufacturers, suppliers and retailers who are using the freight network in the North.

3.2. How does congestion affect the environmental impacts of the movement of freight?

Ships accessing the Northern ports also contribute to air quality issues. MARPOL SECA regulations restricting ship emissions to 0.10% m/m (mass/mass) have been operating on English Channel, the Baltic and North Seas. A global sulphur cap of 0.50% m/m will be implemented by 2020. A switch to cold-ironing and the use of lower sulphur fuels such as LNG may help but will require shore side infrastructure investment. Alternatively, some ships are being fitted with “scrubbers” which “clean” the emissions or rotor sails to harness wind energy.

Figure 1 shows the CO^2 emissions associated solely with Road Transport. As is expected, emissions are worse around the Strategic Road networks, most notably around the city centres. As the current levels appear to be severe in some of these areas, it can only be assumed that without any intervention and increased growth, these concentrations of CO^2 are likely to increase in the future. If these increases are realised and the introduction of cleaner vehicles/ rolling stock is not implemented successfully, it could have devastating effects on the general health of the population, have a detrimental effect on local wildlife and the environment as well as a number of other factors that could have detrimental impact to the wider global environment.

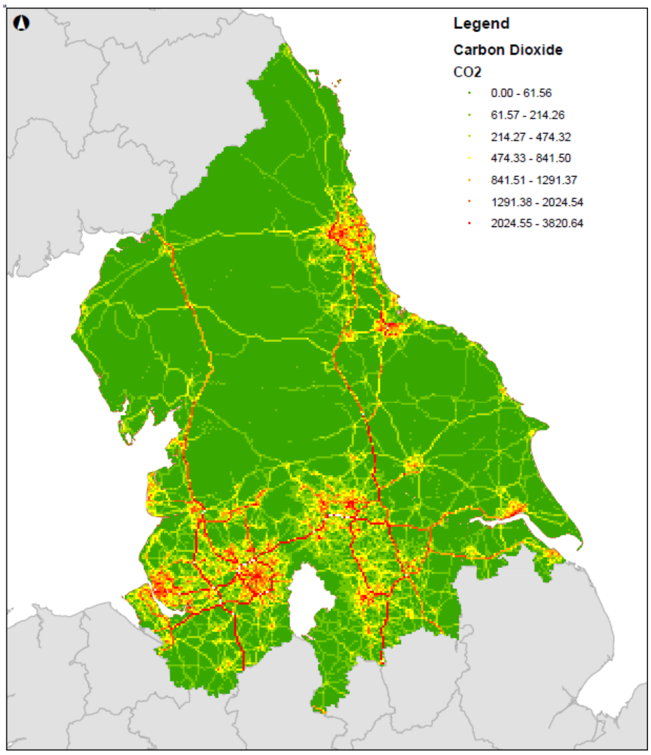

Figure 1 (Extracted from Enhanced Freight and Logistics Analysis) CO^2 emissions within TfN Boundary from Road Transport

3.3. With limited space for new infrastructure, how can we better use our existing urban network to support freight? Are there changes – such as changes to modes, methods, or delivery times - that could help reduce the stress on the urban transport network?

Transport for the North is primarily interested in intra urban flows – inter urban flows are looked after by the Local Highway Authority. The development of Strategic Rail Freight Interchanges and strategic locations of National Distribution Centres can help enhance the journey times for some deliveries. Also with the addition of new technology, quieter vehicles could be used for night time deliveries.

Other issues considered within TfN's Enhanced Analysis include:

- Local consolidation centres to manage inbound goods for a local area using a similar model to London Olympics which used an out of town consolidation centre near M11 to handle goods before controlled movements to site.
- Improved utilisation of out of peak operation – this needs to be balanced against the disruption to local communities.

4. How can freight lower its carbon and air quality impacts?

There are many options in lowering the carbon impacts of freight. Modal shift from road to rail, introduction of electric vehicles, platooning of vehicles, improving engines within existing fleet of vehicles, moving to cleaner fuel in shipping lines. There are different markets for all the solutions above.

Some would benefit from government intervention but all will have costs associated with the change that the industry would find challenging. Additionally, options that would mean freight businesses could grow with the change would be favoured. Hauliers may feel challenged by the threat of the growth of modal shift as their livelihoods would be endangered.

4.1. Are there efficiencies within freight management and distribution practices that could help reduce the CO2 and NOx emissions from freight?

There is a potential case for increasing the movement of intermodal containers on coastal shipping routes between the UK's southern ports and the North of England (and Scotland). This could also include increased services to central European hub ports such as Rotterdam and Antwerp.

Coastal shipping is an increasingly attractive method for the movement of empty containers out of the North due to the heavy import flows. Empty containers do not have the same time pressures as loaded containers and therefore they do not need to travel by road. Travelling on water reduces the environmental impact of moving a container as many can be moved at once.

Another challenge is the unbalanced flows through the Northern ports where greater volumes of freight are being imported compared to the volumes of freight being exported. This often results in wagons, trailers or containers being transported around empty and a number of operators have commented that they often transport more waste from the UK than manufactured goods. Returning empty containers back into the system is also a key issue as it is a cost that creates very little benefit, however this is necessary to ensure container terminals in the North do not end up being a storage facility for empty containers. This needs considering across a wide catchment of partners.

4.2. What role do alternative fuels such as electricity, Liquid Petroleum Gas and biofuels have to play? What are the barriers and challenges to wide-scale uptake of alternatives to diesel and what could be done to help remove these issues?

The barriers and challenges of taking up new technology include cost, desire to see change, cost of installation, fuelling networks and decommissioning of potentially obsolete infrastructure, pressure on the National Grid for available electricity for converting more freight to electric traction and loading on the grid for the additional power should more charging points come online.

4.3. What technologies could best and most realistically be utilised to manage the carbon impacts of freight, both within urban areas and on longer strategic journeys?

For the strategic journeys Smart motorways that keep traffic moving reduces emissions because the steady running of vehicles is more efficient than start stop travelling. Freight within urban areas on Local Highway Authority infrastructure falls outside the remit of TfN. This is the impact of utilising real-time information to manage traffic flows for efficiency. This also occurs with real time information available through various apps and technological solutions.

5. How could new technologies be utilised to increase the efficiency and productivity of UK freight?

The most recent development in the freight industry has been the steady growth in the understanding of the opportunity offered by autonomous vehicles including vehicle tracking. This includes platooning of freight vehicles to increase fuel efficiency by reducing drag, Smart ports utilising technology so freight is only collected when it is ready to be taken onwards from the port or loaded onto a vessel or carrier. This creates more efficient movement of vehicles within the ports and airports reducing pressure on that infrastructure.

5.1. How will new technologies change the capacity and performance of the freight transport network? Over what timeframes might these new technologies begin to affect the freight transport network?

There is very little holistic data available regarding freight performance making this question difficult to answer. By the commercial nature of the freight and logistics business any data that is shared on a company by company basis is sensitive. Network Rail hold data provided by businesses about freight flows on the railway that can be aggregated up. The information can be shared on a strictly confidential basis on the understanding that the analysis performed only gives very opaque results that cannot be disaggregated because this could allow individuals to work out the commercial interests of businesses. This means very few people have the ability to accurately forecast freight activity.

5.2. How can the use of data such as real-time traffic information by artificial intelligence and machine learning systems help to improve freight efficiency and productivity? How might this affect the business models and requirements of freight in the future? Are there any barriers to the greater use of data in freight?

There are barriers to the data usage outlined in the question above. Many hauliers and freight operators access the network at the most efficient times now, because they understand the network and their business. More reliable traffic information does give opportunity to change routes and amend ordering. Fundamentally many movements are just in time movements for factory supply chains from food right through to the automotive sector.

5.3. How do you see technologies such as HGV platooning, digital railway signalling, and autonomous vehicles being integrated into freight distribution?

Initially the bigger companies will embrace the change and develop fleets of vehicles using the technology. Over time with autonomous vehicles becoming more popular and take up increases – the technological infrastructure used in Smart Motorways could be integrated within the vehicles rendering the signage obsolete for the Smart function and available for an alternative use. This could be targeted at specific corridors of activity for pilot runs.

5.4. How might regulations and physical infrastructure need to adapt to new technologies and business models in the freight sector?

Platooning vehicles will travel on the highway with regulated accuracy – one would assume radar technology would be used to keep the vehicles within parameters of the lane markings. This will create wear and tear where the tyres of the platoons constantly travel which may require strengthening of certain designed lanes of the highway surface.

Other issues considered in TfN’s Enhanced Analysis include:

- Gauge clearance on the rail network.
- Longer HGV trailers usage needs to ensure vehicles can fit on proposed routes and junctions.
- There needs to be a consideration around regulations for larger vehicles that may operate an increased proportion of out of hours.

6. Are there good examples internationally of freight systems, policy, infrastructure or technology development and implementation that the UK can learn from to increase freight efficiency and/or reduce the carbon and congestion impacts?

TfN has learned of Smart principles being utilised in the Port of Rotterdam. Also, there are congestion issues there which reduces the viable distance for modal shift.

Conclusion

Transport for the North welcomes the opportunity to work closely with the National Infrastructure Commission to develop solutions to challenges that are facing both the industry and partners working alongside it. The Freight and Logistics sector is identified as a key enabling sector within the Strategic Transport Plan and Northern Powerhouse Independent Economic Review and as such is a key part of delivering the North’s economic potential to 2050 and beyond.

National Infrastructure Commission - Freight Study – Call for Evidence

12th March 2018

1. Introduction

1.1 We welcome the opportunity to make a submission to the National Infrastructure Commission's Freight Study Call for Evidence.

1.2 MAG owns and operates three out of the top four cargo airports in the UK (Manchester, East Midlands and London Stansted). Together they handle over £30 billion worth of Non-EU cargo to and from the UK every year, equating to 740,000 tonnes of air cargo on more than 40,000 dedicated freighter flights.

1.3 MAG airports also handle one in five of all UK passengers, with more than 58 million passing through our airports in 2017.

1.4 These nationally significant infrastructure assets provide essential connectivity both for the regions they serve and the wider UK economy, contributing £7.1 billion in GVA each year.

2. Summary

2.1 The global freight market is going through a period of significant change. A rise in e-commerce has created a substantial volume of b2c freight businesses delivering next day (or similar) products directly to customers. When coupled with substantial economic growth in emerging markets, this creates new demand for air freight services and the need for businesses to be closer to customers.

2.2 We expect these market trends to continue. If the UK is to avoid substantial increases in congestion, emissions and delays, with matching decreases in productivity, then more efficient use of existing airport capacity has to be made. This policy, mentioned in the Government's Draft Aviation Strategy[1], should be actively supported by the NIC.

2.3 Making best use of existing capacity will:

- Decrease the number of miles freight must travel via road by reducing the reliance on Heathrow (LHR) and landing freight closer to customers.
- Reduce CO_2 and other emissions associated with road transport
- Reduce road and rail congestion
- Increase productivity and efficiency in the supply chain, reducing transit times and lowering costs
- Rebalance the economy by supporting regional 'powerhouses', trade and exports.

2.4 **Recommendations**: Making best use of existing capacity will require integration of the whole of the UK's infrastructure (roads, rail, airports and ports), and active investment to improve access to and from airports. Some of this infrastructure is already planned for delivery within the next two decades and it is important that the NIC is active in both shaping how this infrastructure develops, and

[1] Beyond the Horizon, the Future of UK Aviation, DfT, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/636625/aviation-strategy-call-for-evidence.pdf

holding the Government to account to ensure it implements the changes the UK needs.

- **The North**: The NIC has already recommended Northern Powerhouse Rail (NPR) and acknowledged that integration with HS2 at Manchester Airport is important. This key change carries significant economic benefits that have already been recognised by Transport for the North[2] and the International Connectivity Commission[3] but the NIC should know too that integration will also reduce congestion on roads, provide additional rail capacity and support logistics development around Airport City in Manchester where major global logistics firms have positioned themselves by a major transport hub to take advantage of both domestic and international connectivity[4]. The NIC should recommend this integration takes place as proposed as quickly as possible.

- **Midlands**: East Midlands Airport is the largest pure cargo hub in the country, incorporating DHL's second largest global hub. Its links to both Roxhill Rail Junction and HS2 at Toton are necessary to support increases in both freight and passenger volumes. With significant investment by pure freight companies[5] to develop facilities, EMA's night flight regime and location put most of the UK within a four-hour drive. The NIC should support EMA's links to Roxhill, improved road access to the airport along with recommending improved rail frequencies to East Midlands Parkway within all subsequent midlands main-line rail franchises.

- **South East**: London Stansted (STN) already serves as London's pure cargo airport and has the highest passenger modal split of any UK airport. An increase in long-haul operations, combined with improved rail access for passengers will enable the airport to serve a greater proportion of London's cargo needs and reduce reliance and pressure on the freight market in and around LHR. This, in turn, reduces congestion from vehicles on both the M4 and M25 and would serve to dramatically improve air quality arising from road transport use in London. To do this the NIC should recommend the Government invests to improve speeds and frequencies to STN from London, starting with incremental infrastructure improvements, followed by four-tracking and links to Crossrail 2. This will support aviation route growth and airport development throughout the Brexit period and beyond.

2.5 In addition to these physical infrastructure changes and a supportive policy framework for making best use and long-haul aviation development, the Government has the ability to support a growth in renewable aviation fuels as an industry and to reduce airfield emissions by supporting electric vehicles.

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[2] Transport For the North – Strategic Transport Plan, P44 (https://transportforthenorth.com/wp-content/uploads/TfN-Strategic-Plan_draft_lr.pdf)

[3] https://www.transportforthenorth.com/wp-content/uploads/International-Connectivity-Report_websafe.pdf

[4] http://www.airportcity.co.uk/

[5] Both DHL and UPS are currently investing in extended or new UK air hubs. EMA is DHL's second largest global hub for express freight.

2.6 Combined, these changes would substantially increase the efficiency of the UK cargo market, support the development of the sector and help it respond to market trends and support growth across the whole of the UK. In doing so it will reduce the environmental impact of the sector and by keeping imports and exports within the UK, help UK plc.

3. Questions

3.1 **(1) What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?**

Sub Questions

1.1. What do you see as the key drivers to a successful freight system that is fit for the future?

1.2. Which are the key freight corridors that matter the most? Where are the bottlenecks in the freight network, and what investments in upgrades could deliver the best value for money for freight efficiency and UK plc?

1.3. To what extent are the economic benefits of freight factored into wider transport infrastructure investment planning?

1.4. What are the regulatory and legal issues that, if changed, could improve freight efficiency without increasing costs or reducing efficiency?

3.2 The concentration of the UK's air freight market in and around Heathrow (LHR) is a major drag on efficiency and competition within the UK. Whilst the belly-hold capacity and number of routes available from LHR has caused this clustering effect, and brings certain benefits for the freight forwarding sector, there are knock in effects for efficiency, road and rail congestion.

3.3 With the freight market basing itself and facilities around one oversubscribed airport, freight is frequently trucked from airports elsewhere in the UK to LHR. This increases road use and emissions, costs for businesses and the time taken to move goods, as well as reducing the resilience of the UK's trunk road network. Where freight cannot get onto a flight from LHR it can then be trucked overnight to other airports in Europe, compounding the issue and meaning UK plc loses trade to European competitors.

3.4 To increase efficiency and support the whole of the UK economy it is important that as routes, demand and volume grow outside of LHR, the Government actively encourages more efficient and greater use of existing aviation infrastructure and recognises the economic value and necessity of night flights.

Example: In 2016 Hainan Airlines began its first direct route to Beijing outside of London. This one new long-haul route had a significant impact on air freight from Manchester to China. "*Manchester is now the second largest UK air route for exports to China, accounting for 13% of all air exports in 2016, a value of £601 million. The monthly values of exports from Manchester Airport to China have also seen substantial growth, from £49.7m in June 2016 to £181.3m in March 2017 a significant rise of 265% in the value of exports since the route [to Beijing] began.*" [6]

[6] The China Dividend, One Year In, Manchester China Forum http://www.investinmanchester.cn/wp-content/uploads/2017/12/The-China-Dividend-One-Year-In.pdf

3.5 To do this the NIC should encourage the Government to agree and then act upon its proposed policy of 'making best use' of existing runways, as set down in its draft Aviation Strategy[7] and in so doing maximise the economic value of airports in the UK.

3.6 In addition, the Airports Commission has previously set out a number of short-to-medium term recommendations for Government, which were intended to make 'best use' of existing aviation capacity at other airports. These have increased relevance following the vote to leave the EU and the NIC should further examine measures that address these needs when considering the 'medium-term' horizon for the NIA, particularly as Heathrow's new runway is unlikely to be operational much before 2030.

3.7 By making best use of existing runway capacity, facilitating airline development and creating more routes from more airports, the Government increases the market incentives to add additional facilities at airports across the UK, supporting economic growth. This will enable freight to be flown from within the UK and to be handled at a network of airports across the country, significantly reducing trucking miles and increasing local economic benefit. This will directly benefit certain time sensitive industries like pharmaceuticals for which the UK's Northwest is globally recognised as a centre of excellence.

3.8 How might the demand for freight develop and change over the next 20-30 years?

Sub Questions
2.1. How has the demand for freight, and types of freight, changed over the last two decades, and what will be the drivers for changes in the future?
2.2. How is the freight industry planning for future changes in the demand? What levers might be available to shape future demand for freight transport?

3.9 Freight has traditionally been a b2b business, but the rapid rise of e-commerce means that increasingly it is b2c. This creates additional demands and pressures, the most significant of which is the rise in next day (or similar) deliveries of individual packages. To accommodate this demand, air freight companies and the airports that host them are reliant on the quick disembarkation and processing of freight, so they can be transferred through distribution centres and out to customers in an efficient timeframe. In addition, we have seen an increase in commoditisation and perishables, which place similar demands on the system. We expect both upward trends to continue.

3.10 Changes in the air freight market have also mirrored that of wider global growth, with large increases in freight demand to and from China and India, which show no signs of abating. As volumes around the globe have increased, how these volumes move around it are changing too. The increase in point to point routes that we have seen within the passenger market is naturally mirrored in the freight market (e.g. Dubai to Chicago). As new point to point aircraft are converted from passenger to handle freight, the number of commercially viable point to point freight services will become available.

[7] Beyond the horizon – The future of UK aviation (https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/636625/aviation-strategy-call-for-evidence.pdf)

3.11 The increases of b2c services and point to point travel within the freight market drives the demand for capacity at UK airports, with freighters needing increasingly to be close to their customers. The NIC must therefore examine how to respond to this market and maximise the advantages in this trend, make best use of capacity at UK airports across the UK, and not simply rely on a new runway at LHR.

3.12 The NIC should therefore recommend making best use within the aviation strategy, and actively engage in the Government's consultation process.

3.13 What effect does congestion have on the efficiency of the freight movement

Sub Questions
3.1. How does congestion impact upon the productivity and economic contribution of freight? To what extent does congestion affect changes to mode, time or other freight choices?
3.2. How does congestion affect the environmental impacts of the movement of freight?
3.3. With limited space for new infrastructure, how can we better use our existing urban network to support freight? Are there changes – such as changes to modes, methods, or

and emissions?

3.14 See 3.2 -3.4

3.15 How can freight lower its carbon and air quality impacts?

Sub Questions
4.1. Are there efficiencies within freight management and distribution practices that could help reduce the CO2 and NOx emissions from freight?
4.2. What role do alternative fuels such as electricity, Liquid Petroleum Gas and biofuels have to play? What are the barriers and challenges to wide-scale uptake of alternatives to diesel and what could be done to help remove these issues?
4.3. What technologies could best and most realistically be utilised to manage the carbon impacts of freight, both within urban areas and on longer strategic journeys?

3.16 Within the air freight sector, as cleaner aircraft like the B737NG, A320, A350 and Dreamliner families begin to be converted to freight aircraft, noise, carbon and air quality impacts will all be significantly reduced. Reducing the quantity of air freight brought in and then trucked around the country would also substantially reduce the environmental impact of freight (see 3.2 – 3.3).

3.17 In addition to this, the uptake of alternative fuels and airside electric vehicles would substantially reduce emissions.

Renewable Fuels: The UK could reduce the carbon-intensity of aviation fuels, reduce reliance on oil imports and boost the UK economy by developing the infrastructure to support the use of sustainable fuels for aviation, a concept proven in Norway and California and currently used by both Virgin Atlantic and Norwegian Airlines.

These fuels could reduce the UK's aviation emissions by up to 24%, but in addition could generate a Gross Value Added (GVA) of up to £265 million by 2030 for UK plc. Developing a sustainable fuel industry in the UK could also support up to 3,400 direct jobs, and builds on the country's existing fuels sector[8].

Electric Vehicles: Airside electric vehicles were proven as a workable positivity at Manchester Airport last year[9], but incentives to purchase new, efficient vehicles are not currently supported as they are on the road. Encouraging the uptake of airside electric vehicles would reduce airfield emissions substantially.

Drones: There is potential for airports with substantial express freight operations to take into consideration the projected increase in the use of drones for deliveries, which has the potential to significantly alter the future distribution of cargo within the UK.

[8] Sustainable Fuels UK Road-Map - http://www.sustainableaviation.co.uk/wp-content/uploads/2015/09/SA-SAF-Roadmap-FINAL-24-Nov-2.pdf
[9] MAG CSR Report, p22 (https://www.magairports.com/media/1433/mag-2017-csr-report-final.pdf)

Received by email.

Dear Sirs,

I apologise for the delay in responding, but we have only recently been made aware of this request. I do hope that you can take our response into consideration.

The Commercial Boat Operators Association (CBOA) represents water freight carriage by barge on the UK's inland and estuarial waterways and is accepted by the Government as the representative industry body.

1.1The key drivers to a successful freight system that is fit for the future are those which successfully implement a comprehensive freight system which takes into account all the available freight routes and modes of transport, which includes full use of the railways and canals and rivers for freight transport. In this way the best optimisation will be achieved for reducing CO2 and nitrous oxides emissions.

1.2 With respect to the navigable waterways, a non exhaustive list of some of the larger routes are as follows:

Manchester Ship Canal, from Liverpool docks to Manchester (supports carriage of imported goods to Manchester)

Aire and Calder Navigation, from Leeds to the Humber and Hull (proposals are in hand to create the Port of Leeds for handling steel, timber, containers and other freight)

Sheffield and South Yorkshire Navigation from Rotherham to the Humber and Hull (which supports barge oil tanker traffic)

River Ouse – important as it connects the Humber ports with Goole, Selby and York for ships and barges.

River Trent from Nottingham to the Humber and Hull

River Severn and Gloucester and Sharpness Canal from Avonmouth docks to Sharpness, Gloucester and Worcester (currently Sharpness docks are used but insufficiently)

Exeter Canal from the sea/Exe estuary to Exeter

River Thames from the estuary through London via Kew to Shepperton and further upstream

River Lea Navigation from the Thames at East London via Hackney to Edmonton and further north

River Nene from the Wash to Wisbech and further upstream.

One large sized barge carrying 500 tonnes can remove fifty 20 tonne lorry return movements from the local road system.

Where are the bottlenecks in the freight network? What investments in upgrades could deliver the best value for money for freight efficiency and UK plc?

There is a scheme to make the Aire and Calder Navigation to Leeds a Euro Class II standard barge size throughout, enabling barges of 660 tonne maximum capacity to reach Leeds. A comparatively small investment (removing a bottleneck width restriction at Bulholme Lock) will provide this substantial benefit.

Another is the ancient listed bridge at Newark on the Trent, which requires a navigation by pass to increase the barge size on this waterway.

1.3 Insufficient infrastructure investment planning is provided for the navigable waterways. Not enough encouragement is given to organisations responsible for freight movements, and too little effort and Government finance is provided towards both provision of the water freight 'track' and with planning direction where new development is concerned.

1.4 Regulatory and legal issues. As said above, better local authority and national planning guidance and direction is required to ensure that the water freight option is used, instead of being by-passed in favour of road transport.

2.1 The easy access to lorry transport has meant that water freight has dropped over several decades. However there are real opportunities for freight carriage of steel, timber, containers, oil in addition to the 'traditional' cargoes of aggregates etc. Increasing lorry transport is not sustainable with the high production of CO2 and nitrous oxides emissions. Water transport is an environmentally efficient transport mode; see the Canal and River Trust response for figures.

2.2 The Canal and River Trust response provides a good example of how it sees forward planning over its waterways.
Peel Ports Group of Liverpool sees an expanding role for the Manchester Ship Canal, to reduce the road traffic congestion on the motorways in the district.
The CBOA has initiated a study on the Humber which should enable easier barge use all year round between Hull and Immingham.
The PLA in London are also encouraging freight on the Thames with considerable success so far.

3.1, 3.2, 3.3 At present there is no congestion on the waterways as they are insufficiently used. Waterways should be utilised more to alleviate road congestion.

There is considerable discussion about the 'last mile' delivery concept. In Utrecht, Netherlands barges are successfully deployed delivering beer barrels and other goods to local close to waterside places to avoid using lorries. There are plans for the same in Paris. In addition to the larger waterways mentioned above, we have many smaller canals running through our cities which could very well be used for this. London would be a very good case for the use of 'last mile' water delivery, not just for beer but any goods required near to or on waterways. More use of water bus passenger carrying could be implemented on canals and rivers, which could use the same wharves as 'last mile' water delivery. As mentioned, there is every good reason to use the UK's smaller waterways for freight, not just for 'last mile' water delivery but for construction of waterside premises especially in towns and cities.

Park Royal to the west of London, has a large number of companies providing food and other products for London. This may be a good trial case to implement a scheme such as this.

4.1 The Canal and River Trust response details the efficiencies of water transport, providing much lower CO2 and nitrous oxides emissions. CBOA fully supports this. The greater use of waterways will considerably help especially in town and city environments.

4.2 Alternative fuels such as electricity, Liquid Petroleum Gas and biofuels can be implemented on barges to good effect. The provision of refuelling points would need to be addressed.

4.3 Further study is required.

5.1, 5.2, 5.3, 5.4 Various technologies could be employed to assist with barge operations. One such scheme is currently being trialled on Gloucester and Sharpness Canal, where the barge helmsman's smart phone can be used to operate swing bridges to reduce wasteful manning, and to aid barge passage speed.

Other possibilities exist; further study would be required, depending on the future uptake of barge transport. Driverless barges (without a helmsman) are a possibility.

6. In the Netherlands, Germany, France and adjacent waterway connected countries all use large barge transport (up to 3000 tonnes). The water freight infrastructure is well developed in those countries and the UK could do well to follow their example.

I would be pleased to respond further to any points if you require more information.

Yours faithfully,

[Name redacted]
Commercial Boat Operators Association (CBOA)

2 High Street
Eccleshall
Stafford ST21 6BZ

Tel [Telephone number redacted]
Mob [Telephone number redacted]
[Email address redacted]
http://www.cboa.org.uk/

The CBOA is the prime trade organization involved in sustaining and promoting freight carriage on our waterways for economic and environmental reasons.

National Infrastructure Commission – Freight Study Call for Evidence

Preliminary Submission from Centre for Sustainable Road Freight.

[Names redacted] 14/3/2018

Introduction

The Centre for Sustainable Road is pleased to provide this initial submission to the NIC's call for evidence. This submission contains a summary of key issues. Substantially more detail is available in the reports listed. For logistics measures see: [1, 2].

Many studies have recognised potential GHG savings by implementing carbon-reducing measures in the road freight transport. If the measures are widely adopted, they can contribute to the reduction target. If they are not widely adopted, on a national or international basis, they may be interesting as 'demonstrator' projects, but will not contribute significantly to decarbonising the road freight system as a whole. The resources expended on those particular measures would be better deployed elsewhere. Consequently, it is important to understand the barriers to widespread adoption of each measure. These are analysed in detail in [3].

The Centre has performed a detailed quantitative analysis of freight decarbonisation strategies for the UK out to 2050. See [4].

Responses to specific questions

4.1. Are there efficiencies within freight management and distribution practices that could help reduce the CO2 and NOx emissions from freight?

There are various ways in which logistics practice can be used to reduce fuel consumption and emissions. These include horizontal collaboration between operators, consolidation of loads, improved routing, use of consolidation and distribution centres, higher lading factors, a reduction in empty running and use of computerised technologies. These measures reduce emissions by reducing overall distance driven by HGVs. See [1, 2] for details of the impact that these measures could have on reducing future CO2 emissions.

4.2. What role do alternative fuels such as electricity, Liquid Petroleum Gas and biofuels have to play? What are the barriers and challenges to wide-scale uptake of alternatives to diesel and what could be done to help remove these issues?

Natural gas vehicles are fuelled with compressed natural gas (CNG) or Liquefied natural gas (LNG) which are comprised mainly of methane. The carbon intensity of methane is significantly lower than that of diesel fuel when it is burned in an internal combustion engine. Combustion can be achieved either by 'dual fuel' technology, in which a substantial fraction of methane is introduced into the intake air of a diesel-cycle engine. This gas mixture combusts when diesel fuel is introduced during the combustion stroke. Alternatively, a gas-air mixture can be ignited by a spark plug in an Otto-cycle engine. An Otto-cycle engine is inherently less thermodynamically efficient than a diesel engine because it operates at a lower compression ratio, however the lower carbon fuel is still beneficial.

Using second-generation dual fuel technology with high gas substitution ratios, the potential for greenhouse gas reduction is up to 15%. Note however that the methane slip (leakage) due to incomplete combustion in the first generation dual-fuel vehicles must be overcome. This slippage can negate the carbon benefits of the low-carbon fuel and is a high technical barrier to widespread adoption.

Renewable biomethane from landfill gas or anaerobic digestion of waste products has a very low carbon intensity. Most biomethane is currently used to produce renewable electricity and to power homes. In recent years, there has been growth in the number of anaerobic digestion plants operating in the UK. The Renewable Heat Incentive enables companies to obtain benefits by injecting biogas into the UK's gas grid. Although, biogas obtained from renewable sources and burned in a vehicle engine can provide near zero-carbon emissions tank-to-wheel (TTW), availability of biogas is limited for uptake in road freight transport sector. So widespread adoption of biomethane-powered heavy goods vehicles is not a practical proposition. Instead, the benefits of biomethane as a fuel can be quantified by assuming that all available supplies are injected into the national gas grid. This will reduce the average carbon intensity of the resulting grid gas and will improve the decarbonising potential of methane burning engines and any other processes that use grid methane as a fuel. The more biomethane becomes available, the more attractive gas engines become as a solution.

The carbon intensity of grid gas can be estimated at some future time, based on the projected availability of biogas. Assuming the total annual gas consumption of the UK is the same in 2030 as it is now, the analysis in [3] shows that the added biomethane will only reduce the carbon intensity of grid gas by 2.3% from current levels. Consequently, the averaged-out long-term benefits of biomethane are only modestly better than switching from diesel to fossil methane as a fuel. Consequently the barriers of reaching high levels of decarbonisation using biogas are large: there simply isn't enough biogas to go around.

By 2020, the EU aims to have 10% of the transport fuel of every EU country come from renewable sources such as biofuels. This is the so-called 'B10' level which is a blend of 10% biodiesel and 90% diesel. The most widely used source of biodiesel is cooking oil in the UK. Depending on the source, biodiesel B10 can provide savings up to 8% compared to available diesel fuel in the UK. There is no engine modification required up to B20 blend in the current HGVs. However, biodiesel blends above 7% require agreement between fuel suppliers and HGV operator. B20 blend can provide greater carbon savings of up to 16% when mixed with 80% diesel. However, supply volume of higher concentration blends is a major barrier to widespread adoption.

The EU does not have any plans for regulating the decarbonisation of the transport liquid fuel supply further than this 'B10' level. Consequently, although there are Low barriers to reaching the benefits of 10% biodiesel, there is almost no prospect of going further than this on a widespread basis.

4.3. What technologies could best and most realistically be utilised to manage the carbon impacts of freight, both within urban areas and on longer strategic journeys?

The conclusion of the first five years of roadmapping by the SRF [4] is that the vision of 80% reduction in CO2 emissions of the road freight industry by 2050 can be met, however it requires the adoption of a wide range of vehicle measures and changes to logistics. The road freight system will need to transform itself by 2050, not just in response to the climate imperative but also changes in technology, policy, and customer demand. The most ambitious scenario 'Scenario 3' produced through the SRF roadmapping project demonstrates that carbon emissions from UK road freight could fall by 78% between 1990 and 2050, while handling increased demand for the movement of goods. This projection is based on a granular approach, taking account of the differing road freight demands and constraints across different sub-sectors of the economy and the varying applicability of measures according to vehicle size. The assumptions within the model have been validated by stakeholders, to ensure that they are robust [4].

For the 2050 target to be achieved in the road freight sector, early adoption of lower cost measures, such as aerodynamic improvements and driver training, would be required followed by a steady shift away from diesel fuel to hybrid, CNG, LNG, and fully electric vehicles. While the former measures are cost-saving in the short run, as they reduce fuel consumption, the purchase of alternative fuel vehicles requires more significant investment. However, the cost of these vehicles is very likely to fall. While the model cannot reflect all uncertainties about future costs and demands, the final results demonstrate that existing technologies and logistics measures would be sufficient to meet the vision.

In the case of urban delivery and refuse collection vehicles, there is a strong need for a rationalised system for 'opportunity charging' during the periods when they are stopped for loading and unloading. This will require provision of charging infrastructure around cities. Various systems are available – but the most convenient would be in-ground inductive or conductive systems that can be connected to the vehicle when it is parked over a pad mounted in the road surface. Similar charging systems are likely to be needed for buses. The big advantage of such systems is that the vehicles can carry much smaller batteries which are topped-up frequently. This substantially decreases the vehicle cost and embodied energy, increases the payload and improves energy efficiency. (It also eliminates the need for very high power charges that to charge very large batteries quickly overnight.)

The modelling results in the SRF road mapping project also found that the 2050 vision could only be achieved on two important conditions: a) the constraint of cost is suspended – ie some measures that are not financially attractive to operators are promoted through government incentives; and b) that on route charging of articulated vehicles is possible from the late 2030s, such that some long haul freight could be moved by electric vehicles. For both these conditions to be met, policy intervention is critical. Incentives to encourage emissions reduction measures will be needed, at the same time as significant investment in infrastructure for alternative fuels and logistics reconfiguration. The roadmap sets out timelines for the policy and infrastructure requirements of alternative fuel and logistics measure uptake.

Scenario 3 is based on the roadmap model assuming take-up rates for vehicle measures in line with stakeholder consensus, except in the case of electric articulated vehicles. Rather, it is assumed that half of all kilometres by articulated lorry run on electrified roads by 2050. Stakeholder consensus was generally pessimistic regarding the electrification of articulated vehicles, however there are signs that improvements in the technology may be achieved before 2040. In August 2017 Tesla announced the intention to test self-driving electric trucks. Siemens have already tested an electric articulated vehicle that charges while driving.

Such on route charging infrastructure is central to scenario 3. Rather than articulated vehicles carrying a considerable weight and volume of batteries, in scenario 3 the motorway and trunk road networks of the UK are fitted with overhead charging infrastructure. This significant investment would enable the road freight sector to achieve its vision of an 80% carbon emissions reduction by 2050. In the following graph, yellow bars indicate small rigids, green bars large rigids, and blue bars are articulated vehicles.

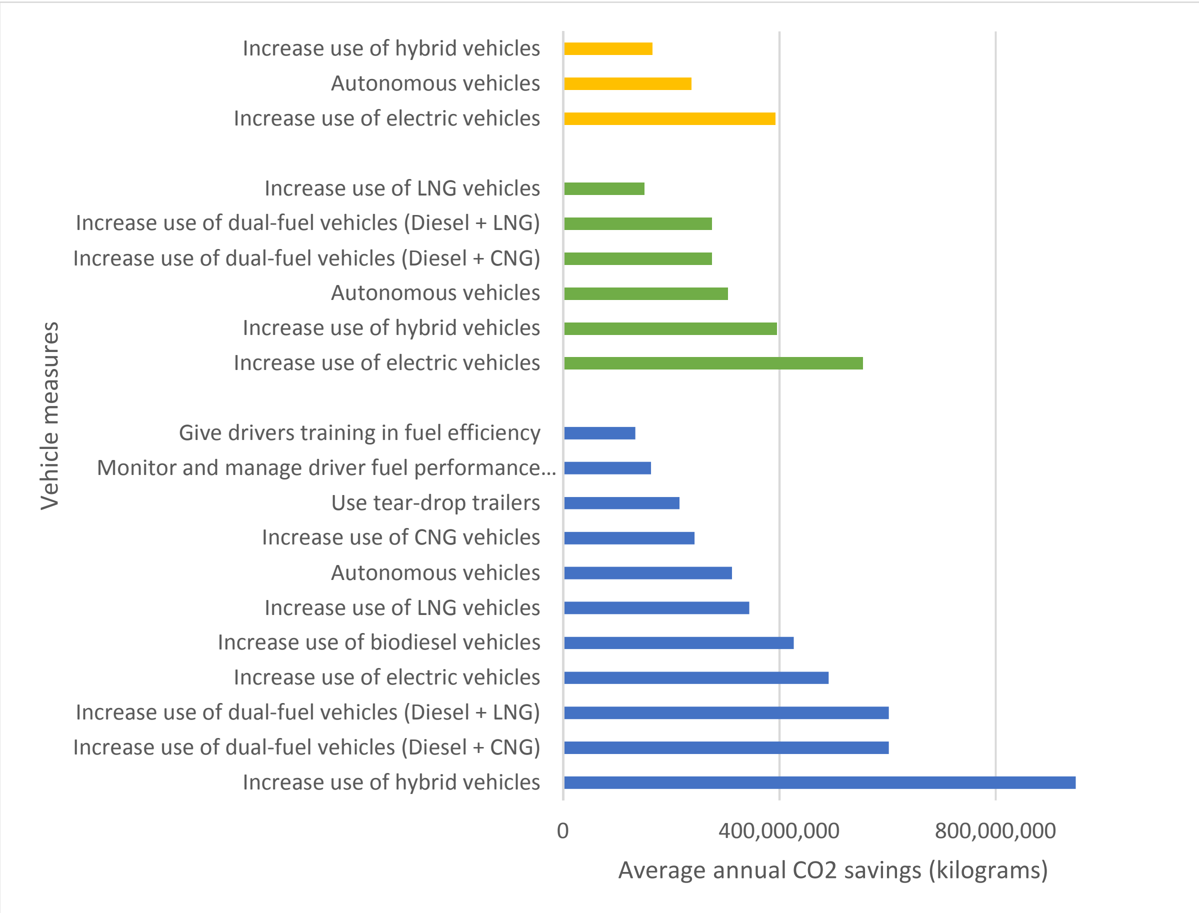

Figure 1. Vehicle measures with greatest annual CO2 savings in scenario 3.

The following chart shows the composition of the 2050 articulated vehicle fleet in scenario 3, which includes 34% electric vehicles in comparison to 10% under scenario 3.

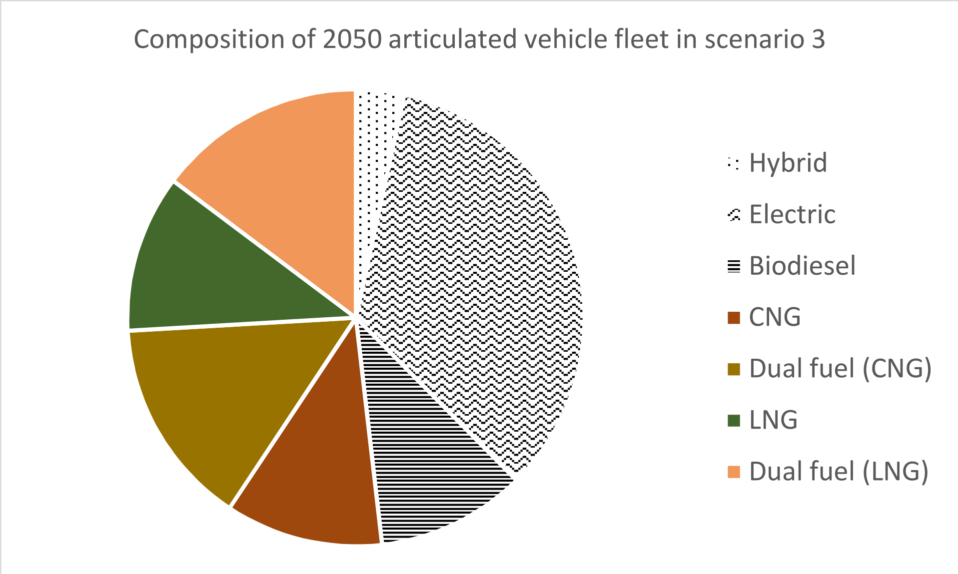

Figure 2. Composition of 2050 articulated vehicle fleet in scenario 3.

5. How could new technologies be utilised to increase the efficiency and productivity of UK freight?

5.1. How will new technologies change the capacity and performance of the freight transport network? Over what timeframes might these new technologies begin to affect the freight transport network?

5.2. How can the use of data such as real-time traffic information by artificial intelligence and machine learning systems help to improve freight efficiency and productivity? How might this affect the business models and requirements of freight in the future? Are there any barriers to the greater use of data in freight?

Only radical improvements in organising road freight are likely to yield the target 80% reduction in GHG emissions by 2050. This will be challenging because company-centric specifics often constrain options. Furthermore, existing empirical data reflects current reality and is of little help in major re-design. Radical logistics transformation will need a shift from company-centric to a whole system perspective, with data collection and modelling performed at the system level.

Enabling horizontal collaboration and alternative forms of freight organisation depends upon using shared data to identify opportunities to pool capacity and improve vehicle fill. Consequently, systems must be devised to enable this to happen. Data sharing must be managed carefully because of companies' concerns about competitive advantage embodied in their proprietary processing. There a role here for Government: setting standards and regulating the system.

There is a need to transform logistics systems to take advantage of widespread availability of logistic data. Undoubtedly new business models will spring-up to exploit the situation as the opportunities present themselves. This can probably be left to the market.

5.3. How do you see technologies such as HGV platooning, digital railway signalling, and autonomous vehicles being integrated into freight distribution?

5.4. How might regulations and physical infrastructure need to adapt to new technologies and business models in the freight sector?

It is evident that increased adoption of electric articulated vehicles would not only require investment in on route charging infrastructure, but would also increase electricity demand from road freight. The issues regarding emissions intensity of electricity production would have even more relevance in scenario 3. Moreover, the timing of electricity demand would differ between battery electric and on route charging technologies. Electric artics could provide a means of further demand smoothing, as they could charge whenever they travelled on the motorway and trunk road network. In contrast to potential demand peaks when batteries are plugged in at the end of the working day, on route charging would create a steady demand throughout the working day. The impact this would have on the electricity system, and the speed with which overhead charging would need to be installed, depends on the trajectory of electric vehicle adoption. The following graph displays this for scenario 3.

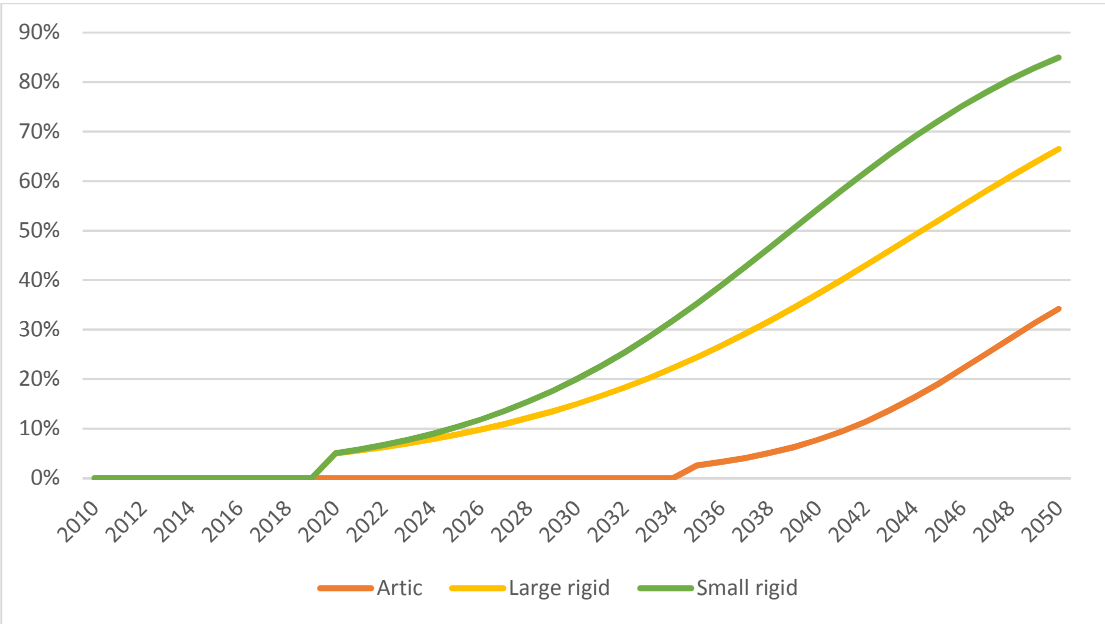

Figure 3. Timing of electric vehicle adoption in scenario 3.

Under this scenario, adoption of electric articulated vehicles increases steadily from 2035. For this to occur, overhead charging infrastructure would need to be planned and installed in the early 2030s. The costs of this are difficult to estimate, though all studies completed to date have indicated that the eHighway solution would be lower cost than any type of battery EV solution, because of the high cost of batteries. Siemens eHighway literature emphasises that lower operating costs make the lifetime investment attractive. It is nonetheless to be expected that the public sector would need to take the lead in providing such infrastructure, especially as a public agency is responsible for UK motorways and trunk roads. For such an investment to be realistically achieved in the 2030s, the long term plans of the Highways Agency and Department of Transport would need to be updated. Further research would be required to understand the scale and costs of the investment, the electrification of railways potentially providing a parallel. Preliminary estimates indicate that the entire Motorway network in the UK could be electrified for about 20% of the cost of the HS2 project.

Achieving the 80% target would therefore substantial opportunity charging infrastructure for electric vehicles in cities[1], with additional work to enable the electrification of long-haul freight movements by articulated lorry. The additional costs of this would undoubtedly confer additional benefits, however. Overhead charging would reduce other negative environmental impacts from articulated vehicles, such as noxious air pollutants and noise. Moreover, this approach has potential synergies with platooning and autonomous vehicles, as overhead charging lines could supplement road markings as a guide for vehicles.

6. Are there good examples internationally of freight systems, policy, infrastructure or technology development and implementation that the UK can learn from to increase freight efficiency and/or reduce the carbon and congestion impacts?

A key step towards more sustainable road freight is introduction of higher capacity long-haul vehicles. Such vehicles have been introduced successfully in many countries (including Australia, Canada, South Africa, Mexico, Nordic countries, The Netherlands, Germany, Spain…) Because fewer vehicle journeys are needed for a given freight task, high capacity vehicles provide substantial efficiency and productivity benefits as well as reductions in fuel consumption and CO2 emission per payload: typically 20-30%. They also provide significant reductions in traffic congestion and infrastructure wear as well as substantial safety benefits, when they are introduced well (eg [5]).

The exemplar for successful introduction of high capacity vehicles is Australia, where the National Transport Commission - NTC was created as an independent statutory body in 1991, to develop regulatory and operational reform for road, rail and intermodal transport. The NTC has established a package of reforms for road freight that have transformed the way that high capacity road vehicles are used in Australia. These measures include:

(i) A system of 'Performance-Based Standards' PBS for ensuring that the vehicles in the scheme all comply with the highest performance for safety and infrastructure wear https://www.ntc.gov.au/topics/productivity/performance-based-standards-pbs/ This is coupled to a system of designated routes on which specified classes of vehicles are limited to travel.
(ii) Strict compliance rules for driver performance, vehicle maintenance, chain of responsibility, etc https://www.ntc.gov.au/heavy-vehicles/rules-compliance/
(iii) 'The Intelligent Access Program' which monitors heavy vehicles with standardised technologies and ensures that they keep to their designated routes, speeds, weights, etc https://www.nhvr.gov.au/road-access/access-management/intelligent-access-program Enrolment in the IAP is a road condition for operating high capacity vehicles.

As a result of this package, the best vehicles are operated by the best operators on suitable routes. All aspects of compliance are assured by a combination of audited self-certification and vehicle tracking technology. The consequence has been significant improvement in the fuel consumption and productivity of the road freight industry in Australia (it now leads the world on this metric) and dramatic improvements in road safety. The high capacity vehicles have been shown to be much safer than the conventional tractor-semitrailer vehicles they replaced.

A similar approach is being taken in South Africa with the implementation of a PBS scheme similar to that in Australia https://researchspace.csir.co.za/dspace/handle/10204/6918 and the Road Transport

[1] See http://www.csrf.ac.uk/2018/03/blog-big-batteries-or-smart-infrastructure/

Management System (RTMS) scheme https://rtms-sa.org/whatisrtms . Dramatic improvements in fuel consumption and safety have been achieved using this approach.

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Further Information

For further information, contact:

[Name redacted]: [Email address redacted]
[Name redacted]: [Email address redacted]
[Name redacted] : [Email address redacted]

Consultation submission on reforming the Road User Levy for HGVs

January 2018

1 Introduction

The Transport Planning Society is an independent institutional body based in England, established to facilitate, develop and promote best practice in transport planning and to provide a focus for dialogue between practitioners and others interested in the field. It is the only body focussing entirely on transport planning as a profession. It is supported by four long established professional institutions – ICE, CIHT, CILT and RTPI - all of whom have an interest in transport planning within their own core activities.

The Transport Planning Society administers its own Professional Development Scheme for transport planners, leading to award of the Transport Planning Professional qualification which is the only professional qualification uniquely aimed at transport planners. The Society has over 1300 professional members in the UK and elsewhere. Many of our members are active in highway planning and management, including extensive experience of working with or within the Highways Agency. They are involved in transport modelling, forecasting and appraisal from a multi-modal perspective and increasingly in the analysis and development of transport planning in response to new technology and vehicle autonomy.

Our response has been drafted by the Policy Group within the elected Transport Planning Society Board. In addition, a draft note outlining the content was circulated to members and published on the website in December with a news item and social media publicity. Our annual member survey contains questions on transport revenue and member preferences. The Policy Group is in continuous dialogue with all members of the Society and the views expressed here may be taken as representative of those held generally by our membership.

Overall it reflects our recognition of the important role of road goods transport, balanced with an objective understanding of the high costs imposed by such vehicles on individuals and places which are not included in their user costs. It sits within our view that all transport modes need to be properly and rationally priced according to use, if both economic and environmental efficiency are to be improved.

Our final comment in this section is that the lack of user charging to reflect real costs may seem like an economic benefit from the user's viewpoint. However, the use of what is in effect a subsidy is not the most effective use of Government money nor does it produce maximum economic benefit. Removing a subsidy paid for largely by non-users should lead to a better allocation of resources and higher total benefits. The increase in revenue can be used to offset taxes elsewhere or to improve public services.

2 Background

The crucial role of road goods transport in delivering to businesses and to individuals is well documented, and the sector employs almost 250,000 people[1]. It is important to distinguish between different roles within the sector, and the very different vehicles which are used. Thus the largest HGVs are articulated and weigh up to 44 tonnes gross, while local deliveries can be undertaken in smaller rigid lorries down to 3.5 tonnes gross. At this weight there is an interplay between HGVs (where registration for an HGV operator licence is required) and large vans. There is also a powerful interplay between transport costs and the number and size of depots where goods are stored. In broad terms lower transport costs results in fewer larger depots and an increase in traffic measured as vehicle kilometres, and goods moved, measured as tonne kilometres.

While undertaking these roles HGVs have very different but very significant third party costs not represented in the way they are charged. These include carbon emissions, road casualties, air pollution, congestion and road maintenance. The latter is particularly important since a 44 tonne vehicle is well over 100,000 times more damaging to road surfaces than a car[2]. These external costs vary between road types, on motorways, for example, many of the impacts are lower than on other A roads or on minor roads, and some impacts such as air pollution and casualties are higher in urban areas than rural. This varies between the impact being considered. An example list used by DfT to summarise impacts is shown below.

- Congestion
- Accidents
- Noise
- Pollution
- Greenhouse Gases
- Infrastructure costs (maintenance or capital)
- Soil and water Pollution
- Nature and Landscape
- Driver frustration/stress
- Fear of accidents
- Community severance (including restrictions on cycling and walking)
- Visual intrusion

Clearly some of these are strongly correlated, such as fear of accidents, visual intrusion and community severance. However the first 6 are often measured and monetised, for example in the DfT' Mode Shift Benefits (MSB)[3]. There are many studies in the UK and Europe on HGV external costs, undertaken for the road and rail industries and for the European Commission. While the detailed costings vary, TPS does not consider it controversial to identify significant external costs in relation to HGVs which are not currently reflected in the cost to road freight users. This leads to significant economic and environmental inefficiency, both having their source in additional vehicle kilometres (30% of HGV kilometres are run empty) than would otherwise be run if full costs were being charged. It should be noted that the optimum balance between efficiency and level of service cannot be achieved if user costs are significantly lower than real costs (as in this case). We therefore consider there is far greater confluence between economic and environmental objectives than is often assumed by policymakers.

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[1] *Domestic Road Freight Statistics, United Kingdom 2016,* DfT July 2017

[2] This is due to exponential increase in damage with axle weight – the 4th power law. An HGV axle of 10 tonnes is 160,000 times more damaging than a car axle of .5 tonnes

[3] *Mode Shift Benefit Technical Report,* DfT 2009, *Mode Shift Benefit Refresh*, DfT 2015

3 Principles for a revised Road User Levy

Static charges versus use

TPS members consistently choose national road user charging as their preferred option for transport taxation, and Lorry Road User Charging (LRUC) is also supported in its own right. In the 2017 survey report the 5 top priorities in ranked order were:

- Introduce national road user pricing
- Increase VED for the most polluting vehicles
- Introduce national Lorry Road User Charging
- Increase the scope and raise the level of tax on aviation
- Introduce a national parking space levy

One of the reasons for this is that transport impacts are closely related to use not vehicle ownership, or in the case of developments, site ownership. Both of these relate poorly to the actual transport impacts and yet annual vehicle duty (VED) and insurance are still a major charge to private users, and one off developer contributions are the main way of retrieving some of the ongoing transport costs from commercial developments. New ways have to be found to ensure optimum economic and environmental efficiency, and a revised Road User Levy could be an important part of this process. Finely tuned policies are also important, for example a VED incentive to buy less polluting vehicles has an ongoing impact, as does the idea of parking limits and charges to incentivise alternatives to driving a car, including greater car occupancy through car sharing.

Key objectives for a revised RUL

The TPS view is that revisions to the RUL should follow certain key objectives if it is to be successful. They do not seem to us to be controversial and are:

i) Creating a better balance between efficiency and competitiveness – reducing empty running and part loading, and creating a better balance between local depots and deliveries

ii) Reflecting the external costs of HGVs not represented in annual Vehicle Excise Duty (VED) or fuel duty, based on marginal external costs

iii) Minimising the environmental and safety impacts not fully addressed in ii)

iv) Encouraging greater efficiency in terms of fair competition between modes

v) Limiting use of the largest HGVs with the greatest impacts in most urban, and some sensitive rural, areas

Basic elements of a revised RUL

What is likely to be the subject of debate is the best charging regime to achieve these objectives. Before discussing this in more detail, TPS considers that there are three key elements to achieving a better balance between external costs and HGV charges. These are:

- Charging for the external costs of different vehicle types, according to use, through a revised RUL
- Providing land for freight as well as passenger transport in places where environmental impact is low and multi-modal connections are available[4]
- Limiting the network where the vehicles with the highest external costs are permitted.

In terms of vehicle quality, the move to higher EU emission standards (Euro VI) for HGVs is already under way and a majority of vehicles will comply by the time a revised RUL comes in to force.

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[4] The national policy guidance on Significant Rail Freight Interchanges (SRFIs) in 2011 has been positive in this regard

Many impacts are related to size rather exhaust emissions, for example carbon and non-exhaust particulates (which are not dealt with in the Euro VI standards). For this reason there is no major reason to charge by Euro standard, instead thought should be given to more innovative technical solutions to improving HGV environmental and safety impacts. This could include new zero emission engines and would be the subject of further work in which TPS would be happy to participate. The end result would be a reduction in the charge according to which impact was reduced and to what extent. Vehicle quality incentives at this level of detail have not been commonly used in the UK, one example is the "hush kit" developed for the London Night and Weekend Lorry Ban in the 1980s and 90s. This also included routeing, driver training and other measures. In view of the seriousness of the impacts it is an approach TPS considers is well worth pursuing.

Current position

Before turning to what might be done to improve RUL, we summarise the problems with the current charging arrangements.

i) Annual VED is a blunt instrument not well related to unmet costs and damage

ii) Fuel duty poorly represents external costs of the most damaging vehicles

iii) The current RUL scheme is time based and does not reflect costs per kilometre travelled

iv) Freezing of both fuel duty and VED for HGVs has meant a growing problem in terms of failure to capture external costs.

We note that in many countries in Europe such as Germany, Switzerland and Austria there are already LRUC schemes in place with measurable benefits in terms of reduced vehicle kilometres.

3 Way forward for RUL

Key elements and preferred package

Before discussing the level of charges which might be appropriate TPS has further refined the detail of its approach to revising the RUL. We set out below the key elements as we see them.

i) Striking a balance between complexity and effectiveness – this points to a weight distance charge such as already in place in many places in Europe. Possible variations could be charging by level of congestion or by type of road, but these are hard to implement outside full road user charging. Smaller HGVs used for local distribution would not be in the national scheme.

ii) The need to be compatible across borders – weight distance charging is already in place in Switzerland, Germany, Austria and other countries and there are standards already in place.

iii) The need for proven technology – this relates to ii) above. Because of the spread of such charging schemes there are now low cost on board units fitted to tens of thousands of vehicles which travel across Europe. This a major move forward from the high initial development cost of the German MAUT system.

iv) Reducing annual VED to de minimis level, or eliminating it altogether. This would not rule out a first year registration charge which would not be levied on units powered by zero emission means (such as electricity, hydrogen, fuel cell etc.). This could be separate, for example through a "feebate" scheme.

v) Supporting trials for larger vehicles and convoys, but only with a view to use on motorways and lengths of zero impact road links to them. This for two main reasons:

- to avoid the shortcomings of the Dykes Act to regulate HGVs where unsuitable roads were being suggested as part of a Lorry Route Network, this led to its virtual abandonment
- to avoid the inefficient "buy the biggest vehicle possible" approach which the current system has encouraged and better match vehicle size and type to the task required.

vi) Allowing greater freedom for local authorities to regulate where the heaviest HGVs are permitted to go, not just for air quality but for other impacts (severance, congestion, safety etc.).
vii) Considering, once the new RUL is fully operational, reducing and removing the current complex Mode Shift subsidies to rail freight.
viii) Following on from the Government's SRFI initiative, creating an investment plan for rail and water freight infrastructure in its own right and in light of the predicted attractiveness of alternatives to road should be given higher priority. The DfT's GB freight model consultants have done major work on such possibilities for Transport for the North[5].

Thus the preferred package is for

- a weight distance charge for vehicles above a specified limit, using an on-board unit and cross checked using digital tachograph information;
- first year or ongoing incentives for innovation to reduce economic and environmental costs and improve skills (for example support for training for smaller haluiers);
- financial and planning encouragement for local authorities to implement targeted goods vehicle controls, especially major urban areas;
- guidance so that planning for transport land for freight in low impact sites with multi-modal connections is included in land use planning (building on the SRFI guidance);
- a strategy for bulk distribution by all modes especially rail and water.

4 Levels of charge and vehicle sizes

Vehicle size and weight

Many summary statistics produced for emissions and accidents cover all HGVs, and this creates a problem for the transport analyst. However the Continuing Survey of Road Goods Transport (CSRGT)[6] provides a finer grained picture as well as traffic counts. For the purposes of this response we focus on the larger vehicles, including the heavier rigids: 12 to 32 tonnes maximum gross weight (2 to 4 axles) and articulated: 26 to 44 tonnes gvw (3 to 6 axles). Even within this range there are major differences in impacts, although most articulated vehicles are 5 or 6 axles with a gvw of 40-44 tonnes.

The current scheme includes HGVs down to 12 tonnes which are up to 11 metres long and usually have 2 axles. Current regulations mean that HGVs of 3 or more axles are required if they are between 18 and 26 tonnes gvw. As can be seen, the smaller rigid HGVs are excluded from the scheme, it is assumed they will be dominantly used for distribution. It is also clear that over half the traffic from HGVs is from the largest category – emphasising the need to focus on their impacts in the national RUL.

Table 1: HGV traffic by axles and road category
Billion vehicle kilometres

Rigid (number of axles)					**Articulated (number of axles)**				
2	**3**	**4 or more**	**Total**		**3 or 4**	**5**	**6 or more**	**Total**	**All HGVs**
8.5	**1.9**	**1.9**	**12.3**		**1.1**	**4.9**	**8.5**	**14.4**	**26.8**

Source: Table TRA3105, DfT, National traffic surveys

5 *Northern Freight and Logistics Report,* MDS Transmodal for TfN, October 2016
6 For example see *Domestic Road Freight Statistics, United Kingdom 2016,* DfT July 2017

While this indicates the polarisation of weights at the extremes of the weight scale, the next step is to consider what evidence is available on the unmet costs of HGV use.

Level of external costs

There are various studies from the UK and Europe considering the external costs of HGVs. The DfT, to meet European regulations regarding unfair subsidy, has produced a "Mode Shift Benefit" (MSB report in 2015, updating the original 2009 version. DfT used to produce an annual road track costs report but this was discontinued in 1995. The MSB table of costs is reproduced below.

Table 2: External costs
Pence per articulated HGV mile

	Motorways (by level of congestion)		Roads		
	High	Low	A	Other	Weighted Average
Congestion	99	24	72	78	**57**
Accidents	0.5	0.5	5.6	5.5	**2.7**
Noise	9	7	8	14	**8**
Pollution	0	0	0.1	0.2	**0.1**
Greenhouse Gases	6	6	7	9	**7**
Infrastructure	7	7	24	171	**18**
Other (roads)[7]	6	6	6	6	**6**
Gross Total	127.5	50.5	122.7	283.7	**98.8**
Taxation	-31	-31	-32	-40	**-32**
Marginal cost gap	96.5	19.5	90.7	243.7	**66.8**

Source: MSB update report, final values 2015

Taxation includes VED but the majority is from fuel duty.

There are three key features from this table.

Some costs rise dramatically according to road type, such as accidents and infrastructure damage. There are also major differences between busy Motorways and less busy. Some costs rise more slowly with road type such as noise, and some do not change very much, such as greenhouse gases and the catch all "other" category. This is one of the justifications for using a combined limitation on which roads are used with an overall national RUL. Clearly, without the policies to provide relief

[7] These include a range of effects including for the MSB report: up and downstream processes; soil and Water Pollution; nature and Landscape; driver frustration / stress; fear of accidents; community severance (including restrictions on cycling and walking); visual intrusion

to non-motorway roads, a higher charge might be required. As part of a package this could be started at a lower level and reviewed in the light of progress, or set to increase automatically unless sufficient progress is made. Taking the lower values in the table as a suitable benchmark, this would imply a charge on HGVs over 12 tonnes 0.4p per kilometre per tonne gvw. This would result in the following rates:

HGVs 12 -17 tonnes gvw	6.8p per km
HGVs 18 -26 tonnes gvw	10.4p per km
HGVs 27 -32 tonnes gvw	12.8p per km
HGVs 33 -44 tonnes gvw	17.6p per km

TPS does not suggest that these would be the final values but it is important to set out both a rational approach to the new structure and a clear indication of the levels which would be required. Higher values would have to be applied if the largest HGVs continued to use non-motorway roads to the current extent.

5 Possible outcomes

Further detailed analysis is required and TPS would be happy to engage in this with DfT and others and to support it through or events programme. However, any idea that RUL would be subject to minor modification would mean that key social or economic objectives would not be met.

The income from this charge would be of the order of £2.5billion from the heaviest articulated vehicles. These are the HGVs with the best documented impacts.

On the other hand the elasticity of demand for HGV vehicle kilometres is quite high – averaging at 0.6 in a European study. This suggests a reduction in the distance goods travel (i.e. vehicle kilometres). This would lead to a reduction in revenue but also a reduction in the disbenefits which is a key objective of this submission.

Further reductions would be achieved by

- locational policies for transport land for freight
- optimisation of depot locations in the supply chain led by external as well as internal costs
- local HGV control schemes (from towns to conurbations) which target specific impacts, for example cab visibility to improve safety, emission standards to improve air quality
- vehicle and logistics innovation which could be really incentivised if the RUL is revised as we suggest.

January 2018

TPS

[Name redacted]
Freight Study
National Infrastructure Commission
5th Floor
11 Philpot Lane
London
EC3M 8UD

16th March 2018

Dear [Name redacted],

National Infrastructure Commission, Freight Study: Call for Evidence

The Rail Delivery Group welcomes the opportunity to respond to the National Infrastructure Commission's (NIC) Freight Study Call for Evidence. Please find a copy of our submission attached to this letter.

As you may be aware, the RDG brings together passenger train operators, freight train operators, Network Rail, HS2 and the rail supply industry. We enable the industry to succeed in transforming the railway for the benefit of customers, taxpayers and the UK economy by providing services to members and giving a voice to passenger and freight operators.

Rail freight is an integral part of our partnership railway and is a key contributor to the economy, securing over £1.7bn of economic benefits for Britain in 2016. Rail freight is also helping to address some of the country's biggest challenges including air pollution, congestion, improving national infrastructure and supporting regional economies.

As we set out in previous evidence to the NIC[1], the importance of rail freight in delivering these benefits is recognised by government. In 2016 the Department for Transport published its Rail Freight Strategy which highlighted the success of rail freight and set out a clear vision for the sector. The DfT's rail vision describes subsequent developments and includes a clear commitment of ongoing funding for freight improvements in the industry's next five-year funding period. The value and importance of rail freight is also recognised by devolved administrations, as underlined by the Scottish Government's Scotland Rail Freight Strategy and Transport for the North's Strategic Transport Plan.

Despite facing challenges in recent years, rail freight is transitioning to a new future and its credentials for delivering for Britain remain strong, particularly where national infrastructure is concerned. It is vital that the appropriate conditions are created to enable rail freight to fulfil its role in delivering a greener, safer and more productive country.

We stand ready to work with the NIC as you develop your evidence base and would be happy to host a workshop with freight operators and Network Rail. We will shortly be publishing a new brochure setting out the benefits that rail freight brings to our country and its future potential. We would welcome the opportunity to discuss this with you. In the meantime, we hope you find our submission useful. If you have any questions, please contact Femi Ogunbiyi on femi.ogunbiyi@raildeliverygroup.com or 0203 780 4069.

Yours Sincerely,

[Signature redacted]

[Name redacted]
[Job title redacted], Rail Delivery Group

[1] https://www.raildeliverygroup.com/about-us/publications.html?task=file.download&id=469773778.

Rail Delivery Group

Response to:

National Infrastructure Commission Freight Study: call for evidence

Date: 16th March 2018

Rail Delivery Group response to:

National Infrastructure Commission
Freight study: call for evidence

Name: [Name redacted]
Organisation: Rail Delivery Group
Address: 200 Aldersgate Street, London EC1A 4HD

The Rail Delivery Group (RDG) brings together passenger train operators, freight train operators and Network Rail together with the rail supply industry. The rail industry is working in partnership for Britain's prosperity to improve and secure prosperity in Britain now and in the future.[1] The RDG provides services to enable its members to succeed in transforming and delivering a successful railway to the benefit of customers, taxpayers and the UK economy. In addition, the RDG provides support and gives a voice to passenger and freight operators, as well as delivering important national ticketing, information and reservation services for passengers and staff.

RDG is working in partnership with the Rail Supply Group (RSG) – which was established in 2014 to strengthen the capability and competitiveness of the UK rail supply chain – to better coordinate shared objectives and further strengthen the rail industry's voice.

For enquiries regarding this consultation response, please contact:

[Name redacted]
[Job title redacted]
[Email address redacted]

Rail Delivery Group
2nd Floor
200 Aldersgate Street
London EC1A 4HD
https://www.raildeliverygroup.com/

[1] *In Partnership for Britain's Prosperity*, RDG (October 2017): https://www.raildeliverygroup.com/files/Publications/2017-10_in_partnership_for_britains_prosperity.pdf.

1. Overview

The RDG welcomes the opportunity to respond to the National Infrastructure Commission's (NIC's) Freight Study call for evidence. We have responded selectively to those questions where we can provide evidence and therefore add the most value: these are questions 1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 3.1, 3.2, 4.1, 4.3, 5.1 and 5.3. Here, we also set out some broader observations that we believe the NIC should reflect on:

A. Rail freight makes a significant contribution to the UK and has achieved a great deal since railway privatisation. RDG's Freight Britain (2015)[2] states that rail freight operators transport over £30bn worth of products including high-end goods, aggregates, construction materials and nuclear waste. One in four containers that enter the UK's south east deep-sea ports travels by rail;

B. Rail freight provides clearly evidenced consumer, environmental, social and safety benefits. Recent analysis shows that rail freight operators secured £1.73bn of economic benefits in 2016 comprising £1.17bn in productivity benefits and £0.56bn in externality benefits from reduced road congestion, improved air quality, lower carbon emissions and improved road safety. Rail freight is also helping to address some of Britain's biggest challenges: rail freight reduces carbon emissions by 76% compared to road for the equivalent mass hauled and each freight train removes up to 76 HGVs from Britain's roads;

C. The value and importance of rail freight is recognised by central government and devolved administrations who have published rail freight strategies to promote the benefits of rail freight and set out a vision for the future of the sector. The government has also committed to funding further infrastructure enhancements in the rail freight network over the next five years;

D. Rail freight volumes have declined in recent years driven largely by a fall in coal volumes and the sector has been through a period of transition to adjust to its new future. Despite fall in coal volumes, intermodal and construction volumes have been strong, underlining the potential of the sector in freight distribution;

E. Rail freight will have an important role to play in the delivery of nationally significant infrastructure including housing, HS2 and Crossrail and has strong credentials for doing so: one freight train carries enough material to build 30 houses[3] and 40% of construction materials in London are delivered by rail[4];

F. Rail freight is also a key part of Britain's partnership railway. A recent project looking at freight paths that were unused as the market changed away from coal saw freight operators relinquishing over 50% of freight paths. This has freed capacity for future freight growth and for some new passenger rail services. The freight sector also provides services which enable Network Rail to efficiently operate, maintain and renew the network.

For rail freight to continue to deliver these positive outcomes, the industry would like to see the following policy levers deployed to support the sector:

- Long-run efficient, stable and affordable access charges and incentives;
- A more level playing field between road and rail freight policy;
- Stable long-term industry planning framework to encourage further enhancements through the new pipeline process;
- Continued investment through the Strategic Freight Network; and
- Streamlined UK planning processes to establish freight terminal locations and railheads in urban areas.

We have appended a resources list to our submission to provide the NIC with some information sources on rail freight. We hope this will support the NIC in identifying any supplementary information required to develop evidence-based policy recommendations in its final report.

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[2] *Freight Britain: Continuity and Certainty for Rail Freight*, RDG (2015): https://www.raildeliverygroup.com/files/Publications/2015-02_freight_britain.pdf.
[3] Mineral Products Association.
[4] Network Rail.

2. Response to Questions

Q1. What are the key constraints to the effective and efficient movement of freight in the UK and what can be done to overcome them?

1.1. What do you see as the key drivers to a successful freight system that is fit for the future?

We have identified the following as the key drivers to a successful freight system that is fit for the future:

Customer Demand

Network Rail's Freight Market Study (2013)[5] shows demand forecasts over a 10, 20 and 30-year planning horizon, with preferred routeing of services and the implied requirements in terms of network capacity and capability. The forecasts indicate 2.9% overall rail freight growth per annum to 2043. Network Rail is currently consulting on forecasts produced for the industry's next control period (2019-24). The forecasts underline the fact that rail has the potential to continue contributing significantly to freight distribution in future, provided the right conditions are in place.

Continued Government commitment to rail freight

A successful rail freight industry relies on continued commitment from central government and other funding bodies to maintain a railway framework that supports freight growth. The importance of rail freight in delivering environmental and economic benefits to Great Britain has been recognised by successive administrations. The Department for Transport (DfT) published its Rail Freight Strategy[6] in 2016, which set out a clear vision for the role of rail freight in limiting road congestion and reducing transport carbon emissions. The strategy moreover highlights the economic and social benefits of rail freight to the UK economy. The value and importance of rail freight is also recognised by devolved administrations, as underlined by the Scottish Government's Scotland Rail Freight Strategy[7] and Transport for the North's Strategic Transport Plan.[8]

Ensuring rail freight is underpinned in government policy will provide certainty to rail Freight Operating Companies (FOCs) to continue delivering for Britain.

Infrastructure Investment to improve capability and capacity

Investment in infrastructure will continue to unlock capability and capacity in the rail freight network while enabling the sector to leverage private sector financing, creating a virtuous cycle of investment. £700m has been invested by government directly into the rail freight network over the last two control periods, removing some of the previous restrictions on both gauge and length on core routes. This has been complemented by investment from ports, terminals and other rail freight users. Investments through the Strategic Freight Network (fund) have delivered excellent value for money with a typical benefit-cost ratio of between 4:1 and 8:1.[9] DfT's recently published rail vision, *Connecting people: a strategic vision for rail*[10], describes subsequent developments, and includes a clear commitment of ongoing funding for freight improvements in the industry's next five-year funding period – generally referred to as Control Period 6 – which runs from 2019 to 2024.

1.2. Which are the key freight corridors that matter the most? Where are the bottlenecks in the freight network, and what investments in upgrades could deliver the best value for money for freight efficiency and UK plc?

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[5] *Freight Market Study*, Network Rail (2013): https://www.networkrail.co.uk/wp-content/uploads/2016/11/Freight-Market-Study.pdf.
[6] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/552492/rail-freight-strategy.pdf.
[7] https://www.transport.gov.scot/media/5362/ts-rail-freight-strategy-a4-aw3.pdf.
[8] https://transportforthenorth.com/wp-content/uploads/TfN-Strategic-Plan_draft_lr.pdf.
[9] *Freight and National Passenger Operator Route Strategic Plan*, Network Rail (February 2018): https://cdn.networkrail.co.uk/wp-content/uploads/2018/02/FNPO-Route-Strategic-Plan.pdf
[10] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/663124/rail-vision-web.pdf.

Strategic Rail Freight Corridors

The Strategic Rail Freight Network (SFN) was enshrined by DfT in 2009[11] and promotes the progressive realisation of a core network of freight-capable rail corridors linking the nation's key deep sea, short sea and bulk ports with the terminals and railheads serving centres of production, distribution and consumption. These Strategic Freight Corridors (SFCs) are set out in Network Rail's Freight Network Study (2017).[12] The table below describes these in turn (see appendix 2 for corridors on a map):

Table 1: Key freight corridors and location of infrastructure constraints

No.	Corridor	Locations of key capacity constraints
1	West Coast Main Line	• North of Preston to Scotland • Between Crewe and Warrington
2	East Midlands and Yorkshire	• South Yorkshire Joint Line
3	Felixstowe[F] to the West Midlands and the North via London or Ely	• 'Cross Country' via Ely and Leicester
4	Southampton to the West Midlands and the West Coast Main Line	• Didcot and Oxford areas • Basingstoke area
5	Channel Tunnel	• Channel Tunnel classic routes (i.e. the non-HS1 routes)
6	Cross London flows including Essex Thameside	• Looping availability on the North London and Gospel Oak to Barking Lines
7	South West and Wales to the Midlands	• Water Orton Area and Cross Birmingham
8	Northern Ports and Transpennine	• Transpennine flows via Diggle, Calder Valley and Hope Valley routes • Access to Ports, including Liverpool and Teesport
9	Midland Main Line	• Bedford, Leicester area and Sheffield
10	Great Western Main Line	• Didcot area
11	Anglo-Scottish and Northern regional traffic	• East Coast Main Line (north of Newcastle upon Tyne) • West Coast Main Line North of Crewe

Source: *Freight Network Study 2017*, Network Rail

Bottlenecks and Investment in Upgrades

The industry has identified five of the 11 freight corridors referenced in the Freight Network Study that warrant the most urgent intervention which, if addressed, could alleviate currently constrained traffic growth and deliver value for money for freight efficiency and UK plc. The table on page 6 highlights some key interventions that are investment options for each of these five high priority corridors:

[11] *Strategic Rail Freight Network: The Longer Term Vision*, DfT (2009): http://webarchive.nationalarchives.gov.uk/20110218174805/http://www.dft.gov.uk/pgr/rail/strategyfinance/strategy/freightnetwork/strategicfreightnetwork.pdf.
[12] *Freight Network Study*, Network Rail (April 2017): https://cdn.networkrail.co.uk/wp-content/uploads/2017/04/Freight-Network-Study-April-2017.pdf.

Key Freight Corridor	CP6 Candidate Freight Schemes	Estimated cost range
Felixstowe to West Midlands & the North	– Doubling of Haugley Jn – Signalling Headways Bury – Ely area (level crossings / bridge speeds) – Ely to Soham doubling – Peterborough - Syston signalling/level crossings – Syston – Sheet Stores gauge (W10/W12) – Further refine layout at Ipswich Yard	£10m – £15m £50m – £70m £100m – £250m £120m – £150m £50m - £60m £5m - £10m £1m - £5m
Southampton to West Midlands & WCML	– Kenilworth doubling	£100m - £170m
Channel Tunnel classic route	– Gauge enhancement (up to W12)	£50m - £80m
Cross-London, and Essex Thameside	– Ripple Lane Nodal Yard – Thameside Level Crossings (capacity)	£10m - £15m £30m – £40m
Northern Ports & Trans Pennine	– Trans Pennine gauge enhancement (up to W12) – New loop between Up Decoy and South Yorkshire Joint Line – Trans Pennine freight capacity	£100 - £200m £5m-£10m tbc
	Total	*c.£0.6bn - £1bn*

Source: *FNPO Route Strategic Plan,* Network Rail

Network Rail's Freight and National Passenger Operator Route Strategic Plan (2018)[13] also identifies examples of longer term (CP6 and beyond) schemes that have the potential to positively impact freight capacity and capability if they are scoped and developed appropriately. These include:

- Grade separation of Werrington Junction, near Peterborough
- East-West Rail scheme linking Oxford with the West Coast and Midland Main lines
- HS2

The DfT's and Scottish Government's Statements of Funds Available (SoFA) make commitments to funding further investment to enhance the rail freight network in the industry's next Control Period, CP6 (2019-24).

1.3. To what extent are the economic benefits of freight factored into wider transport infrastructure investment planning?

To date, government benefit assessments of rail freight have largely focussed on its environmental benefits. Two grant schemes currently operate to promote the environmental and social benefits of moving goods by rail instead of road. These are:

- **Mode Shift Revenue Support (MSRS) scheme**: administered by the DfT, the MSRS assists companies with the operating costs associated with running rail and inland waterway freight transport instead of road (where rail/ inland waterways are more expensive than road but offer significant environmental benefits). DfT estimated that this scheme could remove up to 23,562 lorry journeys from roads in Great Britain between October 2016 and March 2017 and achieve an environmental cost-benefit ratio in excess of 4.06:1.[14]
- **Freight Funding Grant (FFG):** the Scottish and Welsh Governments also offer FFGs, which help offset the capital cost of providing rail and inland water freight handling facilities.[15]

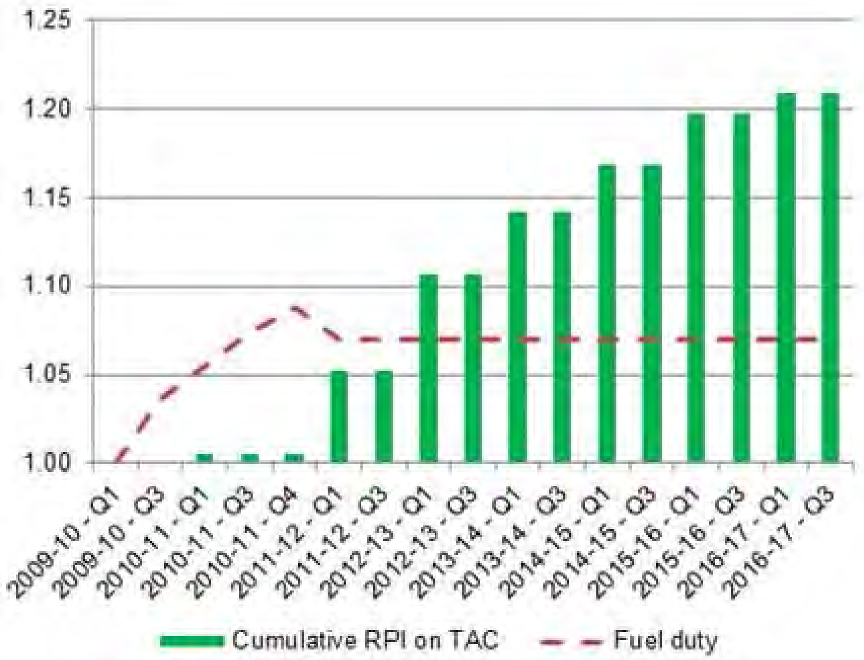
[13] *FNPO Route Strategic Plan*, Network Rail (February 2018).
[14] Grant funding to support the transportation of freight by rail and water, October 2016, DfT.
[15] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/643021/MSRS_Guide_2015_16.pdf.

At present, government benefit assessments of freight do not take account of the productivity benefits offered by rail freight – the industry would like to see government factor in the productivity benefits of rail freight in future. Recent research by KPMG on behalf of the industry highlights that rail freight made a £1.73bn economic contribution to the UK in 2016, with £1.17bn of productivity gains generated and an additional £0.56bn in benefits from reduced road congestion, air quality, carbon emissions and improved safety.[16]

1.4. What are the regulatory and legal issues that, if changed, could improve freight efficiency without increasing costs or reducing efficiency?

The industry would encourage the development of a strong evidence base to inform policy development on the fairness of competition between rail and road freight transport. An example of existing analysis comes from Campaign for Better Transport (CBT), which finds that hauliers only internalise 30% of the societal costs, while effectively receiving a £6.5bn annual subsidy in costs in terms of congestion, road safety and air pollution. Furthermore, hauliers have benefitted from a freeze in fuel duty since 2011.[17]

The CBT analysis also shows that regulated Track Access Charges (TACs) paid by rail freight operators have increased since 2011, when fuel duty was frozen (see the chart below). CBT estimate that, by the end of the industry's current control period (CP5), these TACs will have increased by 15% overall.



Source: Office for National Statistics, Network Rail, Campaign for Better Transport

We welcome the measures the Government is taking already, including the Transport Secretary's guidance to the ORR in which he states that he wishes the *"ORR to have regard to the affordability of freight charges and to ensure that the rail freight industry has sufficient clarity and certainty about the costs that they will face in CP6 as soon as possible."*[18] The ORR is currently undertaking a review to assess what level of charges the rail freight industry is able to bear.

We would encourage the Government to consider what further steps can be taken to provide a level playing field between rail freight and HGVs. This could include broadening the scope of the benefits assessments of rail and road modes undertaken within government to consider the economic, productivity, societal and environmental impacts/benefits of both.

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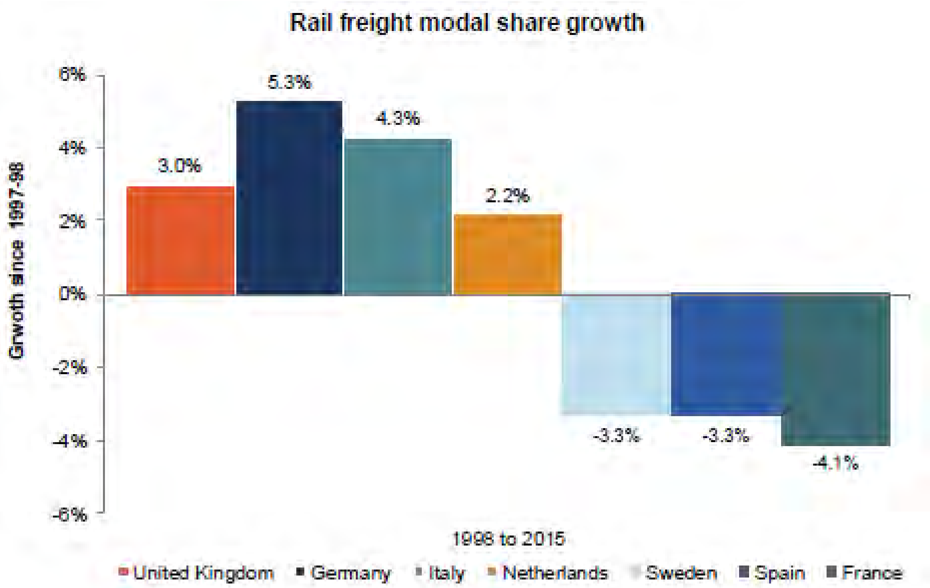
[16] KPMG Analysis, January 2018.
[17] http://freightonrail.org.uk/ConsultationsHMTreasuryCallforEvidenceRedDiesel.htm.
[18] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/629698/guidance-to-the-office-of-rail-and-road.pdf.

Q2. How might the demand for freight develop and change over the next 20-30 years?

2.1. How has the demand for freight, and types of freight, changed over the last two decades, and what will be the drivers for changes in the future?

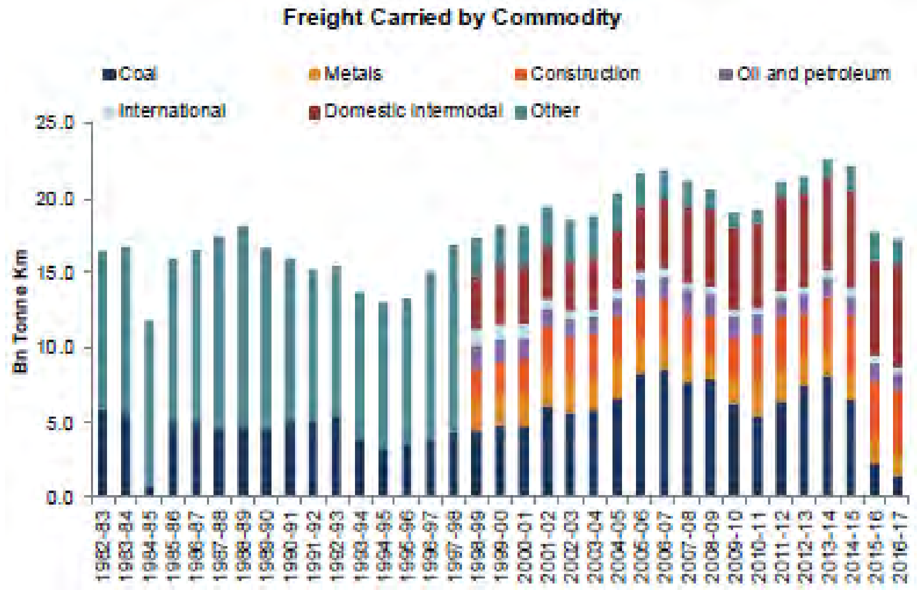
For most of the post-privatisation period, freight has been one of rail's biggest success stories. From a 59% decline between 1953 and 1996-97, rail freight volumes rose 80% between 1996-97 and 2013-14, with growth in 13 of the last 19 years.[19] Rail freight now accounts for 9% of goods moved.[20] As the chart below (*rail freight modal share growth*) illustrates, relative to a number of other European countries, the UK has experienced one of the highest levels of rail freight mode share growth since 1997-98: at 3% it is behind only Italy and Germany.



Source: Eurostat Database, RDG

The chart below (*freight carried by commodity*) provides an overview of rail freight commodity trends. The chart highlights that coal volumes have declined since privatisation. In 2015-16, this decline has been a lot sharper than in previous years – driven to a large extent by government decarbonisation and energy efficiency targets. This decline in coal has resulted in an overall decline in rail freight volumes in each of those years. Other traffic has grown significantly: intermodal volumes have increased 93% since 1998-99 and construction material traffic has also grown as businesses have increased their presence on rail, and larger quarries have replaced smaller sites that were not previously linked to rail.[21]

[19] *Partnership Railway in numbers, RDG* (October 2017), *Freight Britain*, RDG (2015).
[20] 'Domestic Freight' TSGB0401, *Transport Statistics for Great Britain*, DfT, 2017: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/661933/tsgb-2017-report-summaries.pdf.
[21] *Partnership Railway in numbers, RDG* (October 2017), Freight Rail Usage, ORR, 2018.



Source: ORR Data Portal, RDG

Drivers of Change

In future, freight demand is likely to be driven by a number of factors including: de-carbonisation and the increased focus on air quality; industrial developments and strategy; and the economic impact of Brexit.

- ***De-carbonisation and air quality*** – The UK government's commitment to reduce carbon emissions by 80% by 2050 (in line with EU and UN targets), will drive further reductions in the use of coal in industrial processes and therefore reduce rail freight coal volumes further. The drive to reduce local air pollution could also impact on freight distribution, with polluting modes of transport potentially facing penalties based on the level of their emissions.

- ***Industrial strategy*** – freight demand will also be influenced by the Government's housing strategy and the development of major infrastructure such as HS2, Crossrail 2 and the third runway at Heathrow Airport. This will require increases in construction materials and bulk materials such as steel.

- ***Brexit*** – as the UK prepares to leave the EU, increased focus will be given to ports to ensure the UK sustains its competitiveness globally. Subject to the future trade deals agreed between the UK and its international trading partners, rail freight could become a key enabler in facilitating export growth and in reducing the congestion that may arise from enhanced border checks.

2.2. How is the freight industry planning for future changes in the demand? What levers might be available to shape future demand for freight transport?

Together, the rail industry plans for future freight demand through the Network Rail Long-Term Planning Process (LTPP) which looks at the long-term capability of the network up to 30 years into the future to ensure efficient use of network capability and capacity, within a mixed freight and passenger rail environment. Outputs of this process include the Freight Market Study and Freight Network Study which: forecast long-term growth for the sector; and set out the infrastructure requirements needed to deliver this growth respectively. The Freight Market Study (2013) predicted 2.9% overall rail freight growth per annum up to 2043.[22] Network Rail is also consulting with freight operators on forecasts for the industry's next control period, 2019 to 2024. This process enables individual freight operators to make more effective commercial decisions and plan their businesses with greater predictability and efficiency.

In addition to the LTPP, freight operators are also taking action to prepare their businesses for future changes in demand. Examples include:

[22] *Freight Market Study*, Network Rail (April 2017).

- Responding to declining coal volumes and decarbonisation efforts by purchasing new equipment to venture into new renewable markets such as biomass, while consolidating in intermodal markets and growing construction traffic;
- Increasing operational efficiency by running fewer, longer trains. As such, operators have been able to relinquish 50% of their freight paths, freeing up capacity for future freight growth as well as some new passenger services to support likely increases in passenger demand;
- Investing in innovative technologies, such as stop-start, which help to improve air quality through reducing carbon emissions from freight locomotives; and
- Trialling new technologies through the Digital Railway Programme to improve operational efficiency.

Policy Levers to support rail freight

The industry has identified a number of policy levers that will enable rail freight to continue to meet demand and play a crucial role in delivering government objectives:

- Long-run efficient, stable and affordable access charges and incentives to enable long-term investment and growth;
- A more level playing field between road and rail in policy and investment decisions. The impact of the fuel duty freeze on modal shift could be modelled. We propose an enhancement and broadening of scope for Mode Shift Revenue Support (MSRS). This could see the rail share of the deep-sea container market rise;
- A stable long-term rail industry planning framework and continued investment through the Strategic Freight Network (in capacity and capability improvements);
- Streamlined planning policy and processes to enable freight terminal locations and railheads to be established in urban areas. Strategic retention of land is essential for operational use and growth. The use of rail freight needs to be specified on planning consents, refuse management, HS2 delivery etc;
- Sufficient certainty of funding for Digital Railway and the rail freight cab fitment of traffic control systems to improve capability.

Q3. What effects does congestion have on the efficiency of freight movement and emissions?

3.1. How does congestion impact upon the productivity and economic contribution of freight? To what extent does congestion affect changes to mode, time or other freight choices?

KPMG analysis shows that supporting rail freight growth could help to reduce rising levels of congestion on the UK's road network, with rail freight generating £556m in externality benefits for the UK economy in 2016. The case for modal shift to rail is already strong. Each freight train removes up to 76 heavy goods vehicles from Britain's roads. Rail freight operators transport goods that would otherwise require 7.79 million HGV journeys each year. This results in 1.66 billion fewer HGV kilometres every year, freeing up capacity on Britain's roads.[23]

Rail freight could play a greater role in tackling congestion on key road corridors. Research by Campaign for Better Transport and the DfT[24], identifies opportunities for targeted upgrades of existing rail lines to enable large numbers of lorry loads to be transferred to rail. The resulting modal shift would significantly contribute to lower congestion on these key road corridors.

The study highlights the need to holistically consider cross-modal interventions on a corridor-by-corridor basis when evaluating options to reduce congestion.

3.2. How does congestion affect the environmental impacts of the movement of freight?

In supplement to their initial report, further research by MTRU on behalf of Campaign for Better Transport looked at the impact of congestion upon emissions factors along key rail freight corridors.[25] Examining the A14 between

[23] *Freight Britain*, RDG (2015), *Impact on road haulage*, ORR, 2016.
[24] *Impact on congestion of transfer of freight from road to rail on key strategic corridors*, MTRU (March 2017).
[25] *Supplementary report on environmental and safety impacts of the transfer of freight from road to rail on key strategic corridors*, MTRU (December 2017).

Felixstowe and the Midlands, the A34 from Southampton to the Midlands and the M6 and M62 motorways (which collectively carry around 38,000 HGVs per day), the study finds that encouraging modal shift to rail could reduce the number of HGVs on the road by 2,000 a day, resulting in lower levels of harmful NOx, particulates and carbon emissions. The potential emissions savings are described in the table below:

Emission Type	Source	Reduction (%)
NOx	All road traffic in the corridors studied	10%
Particulates	All road traffic in the corridors studied	7%
Carbon	All HGVs over 3.5t gvw nationally	2.5%

Source: Campaign for Transport, MTRU

The study underlines the potential environmental benefits that could be garnered with appropriate levels of investment in key rail lines and infrastructure.

Q4. How can freight lower its carbon and air quality impacts?

4.1. Are there efficiencies within freight management and distribution practices that could help reduce the CO_2 and NO_x emissions from freight?

Rail freight is already recognised as a relatively 'green' mode of transport, reducing carbon emissions by 76% compared to road.[26] A tonne of goods can travel 246 miles by rail as opposed to 88 miles by road on a gallon of fuel. Rail fundamentally uses less fuel than road and therefore emissions per tonne of freight moved are also lower.[27] Freight operators have made progress in streamlining operations to reduce air pollution including investing in new rolling stock, with class 68s and 70s replacing older locomotives as well as by running fewer, longer trains.

There are other opportunities to reduce pollution impacts by distributing goods by rail. For example, some local authorities will be focused on reducing the number of HGVs on sensitive sections of their road network. This could open the way to considering alternative freight movement strategies in both local government as well as the private sector. Combining rail freight with low emission first/last mile delivery options raises new opportunities including: rail-based transport to edge-of-town trans-shipment centres; and new freight rail services running into cities.[28]

Additionally, the Rail Technical Strategy Capability Delivery Plan highlights the opportunity for the introduction of freight to passenger trains or so-called "flexible freight". This would see, *"freight solutions working in tandem with passenger services opening up new freight markets for the railway, providing a reliable, high speed and energy efficient alternative to road freight"*.[29] This could contribute towards fuel usage and emissions reductions.

4.3. What technologies could best and most realistically be utilised to manage the carbon impacts of freight, both within urban areas and on longer strategic journeys?

Electrification of the UK railway network remains a long-term solution to managing the carbon and air quality impacts of rail freight. However, there are other opportunities for more immediate deployments of technology which are already, and could further, reduce rail freight emissions.

For example, Direct Rail Services (DRS) have invested in a fleet of 10 class 88 dual electric and diesel locomotives which can go anywhere on the network; and retrofitting of start-stop technology has been adopted on class 66 locomotives to reduce fuel usage.

As set out in response to question 5.1, the Digital Railway Programme is accelerating digital enablement of the rail freight industry, creating operational efficiencies which could support reductions in rail freight emissions. The

[26] *Freight Britain*, RDG (2015).
[27] https://www.raildeliverygroup.com/files/Publications/consultations/2017-11_rdg_response_hoc_air_quality_inquiry.pdf.
[28] http://www.rfg.org.uk/wp-content/uploads/2017/12/Air-quality-freight-FINAL-2.pdf.
[29] *Rail Technical Strategy: Capability Delivery Plan*, RSSB (2016): https://www.rssb.co.uk/rts/Documents/2017-01-27-rail-technical-strategy-capability-delivery-plan-brochure.pdf.

priority scheme for rail freight is the European Train Control System (ETCS) cab fitment. However, other Digital Railway technologies, such as the 'Connected' Driver Advisory Systems (C-DAS), have the potential to enable reductions in fuel and energy consumption, thereby reducing emissions.

Q5. How could new technologies be utilised to increase the efficiency and productivity of UK freight?

5.1. How will new technologies change the capacity and performance of the freight transport network? Over what timeframes might these new technologies begin to affect the freight transport network?

Digital Railway Programme

In the case of rail, there is an urgent need to deliver greater capacity on the existing rail network and to move towards a more resilient railway that recovers from disruption more quickly than currently. The Digital Railway Programme is a rail industry-wide initiative designed to benefit the economy by accelerating the digital enablement of the railway. The rail freight industry has identified two key elements that need to be considered and specified within the Digital Railway development process:

- Due to the nomadic nature of fleet flows, freight locomotives will have to be prioritised for initial European Train Control System (ETCS) fitment in order for line side signals to be removed;
- To realise the maximum benefits of the Digital Railway, the ETCS technical and operating parameters must be optimised to reflect the latest freight braking performance data to ensure that freight performance and capacity are not restricted;

Key benefits for the freight industry that Digitalisation could provide, centre on the following areas:

- Additional capacity through enhanced signalling system capability delivering consistently higher train velocity and headway reduction;
- Improved quality of freight paths with enhanced traffic management capability, adapting real-time changes for cross-route flows across regional control centres. In itself, this has the potential to improve the quality of paths, the interaction between freight and passenger services and overall network management;
- Digitalisation could also improve freight pathing by optimising live network timetable data. There is an opportunity to create a wider traffic management network, connecting the cross-London freight flows to the key radial intermodal corridors from the ports of Felixstowe, Southampton and London Gateway across London to the Midlands, North and Wales;
- Train control and operation could be optimised if systems were capable of dynamic modelling of freight rolling stock capability.

In December 2017, Network Rail awarded Siemens Rail Automation a contract to design, test and obtain approval for installing Trainguard 200 onboard ETCS equipment on freight traction. The design, testing and approvals stage for each class of vehicle starts now, with heaviest used freight locomotives a priority, and work to retrofit the entire freight fleet will begin in 2022 and continue through to Control Period 7 (CP7, 2024-2029).[30]

Other Freight Technologies

Additionally, the freight industry has been collaborating to leverage small-scale technological improvements and has delivered benefits through Control Period 5 to date. Potential future schemes could include:

- Forward Facing CCTV (FFCCTV) – It is proposed that Network Rail could support the purchase and fitment of FFCCTV equipment and associated interfaces. Freight Operating Companies (FOCs) would then provide Network Rail with access to that data for use in investigating Signals Passed at Danger (SPaDs), maintenance and vegetation management etc;
- Application Programming Interface and Open Data - Network Rail could provide FOCs with open access to systems and data owned by Network Rail. This would improves transparency and allow single sourcing of reliable information. It is expected to help improve FOC efficiency;

[30] https://www.networkrail.co.uk/feeds/freight-trains-in-britain-to-be-upgraded-with-delay-busting-digital-technology-in-multi-million-pound-deal/.

- Improved planning tools - FOCs have highlighted issues with the current planning and path bidding process and want a new, easy to use visual tool to simplify processes and improve bid success rate. Network Rail System Operator (SO) has a project currently being trialled called "Whole System Modelling";
- Total Operations Processing System (TOPS) Replacement – The TOPS system has been the backbone for recording the operational lifecycle of freight wagons for the past four decades within the rail freight industry. However, it is now a very old system, and is poorly placed to meet the needs of the modern freight industry. A programme is being developed to manage the replacement of TOPS in a safe and controlled manner.

Given that funding for these schemes has not been finalised, it is not possible to provide detail on timescales at this stage.

5.3. How do you see technologies such as HGV platooning, digital railway signalling, and autonomous vehicles being integrated into freight distribution?

Please refer to our response to question 5.1 on how the Digital Railway programme is being integrated into freight distribution.

HGV Platooning and Autonomous Vehicles

As set out in previous evidence to the NIC[31], we do not believe that HGV platooning can yet be confidently proposed as the solution to alleviating congestion, poor air quality and other challenges on our transport networks. The technology is essentially untested, and other transport bodies (for example, the Road Haulage Association, AA and RAC) have expressed concern regarding the impact it will have on other motorists in terms of safety and congestion. The concept of platooning, namely enabling vehicles to run closely together in order to improve fuel efficiency and make better use of road space, is effectively what trains, both passenger and freight, already deliver: one freight train can remove up to 76 lorries from our roads.[32] In addition, the congestion benefits of rail freight are not just associated with motorways, where lorry platooning is being considered, but on "A" roads as well. Given that more than two thirds of rail freight traffic is non-containerised, we would argue that it would be neither practical or desirable to see this traffic moved by road.

Moreover, modal shift to rail is underpinned in government policy – as evidenced by the confirmed Rail Freight Strategies of DfT and Transport Scotland and Transport for the North's Strategic Transport Plan – and is supported by the public. Recent polling by Campaign for Better Transport shows that almost two thirds of the public want to see more freight moved by rail, with only 2% wanting to see more freight moved by road.[33] Further, the widespread adoption of autonomous and/or electric vehicles on the road network, will rely on a significant cultural change – for example, around driver behaviour: we are not aware of evidence to demonstrate the likelihood of achieving this shift in the foreseeable future.

[31] https://www.raildeliverygroup.com/files/Publications/consultations/2018-01_rdg_response_nic_consultation_national_infrastructure_assessment.pdf
[32] *Freight Britain*, RDG (2015).
[33] http://www.freightonrail.org.uk/PressRelease30-06-2017-opinion-poll.htm.

ANNEX I – SUPPLEMENTARY RESOURCES LIST

Department for Transport

- *Connecting people: a strategic vision for rail* (November 2017)
- *Freight Carbon Review: Moving Britain Ahead* (February 2017)
- *Rail Freight Strategy: Moving Britain Ahead* (September 2016)

Rail Delivery Group

Consultation Responses
- NIC call for evidence on a National Infrastructure Assessment (January 2018)
- House of Commons inquiry on Improving air quality (November 2017)

Reports
- *In Partnership for Britain's Prosperity* (October 2017)
- *Freight Britain: Continuity and certainty for rail freight* (2015)
- *Keeping the lights on and the traffic moving: Sustaining the benefits of rail freight for the UK economy* (2014)

Data
- *Partnership Railway's Transformation in numbers: Dataset on rail industry finances, performance and investment since 1997-98* (December 2017)
- *Investment in rail: the economic benefits*, Oxera (October 2017)

Transport Scotland

- *Delivering Your Goods: Benefits of using Rail Freight* (2017)
- *Delivering the goods: Scotland's rail freight strategy* (2016)

Network Rail

Business Plans
- *Freight and National Passenger Operator Route Strategic Plan* (February 2018)
- Digital Railway Programme Strategic Plan (January 2018)
- Geographical Route Strategic Plans: https://www.networkrail.co.uk/who-we-are/publications-resources/strategicbusinessplan/
- *Railway Upgrade Plan 2017/18* (2017)

Reports
- *Freight Network Study* (April 2017)
- *Freight Market Study* (October 2013)
- *Value and Importance of Rail Freight* (July 2010)

Other
- Strategic Freight Network: https://www.networkrail.co.uk/industry-commercial-partners/rail-freight/

Freight on Rail

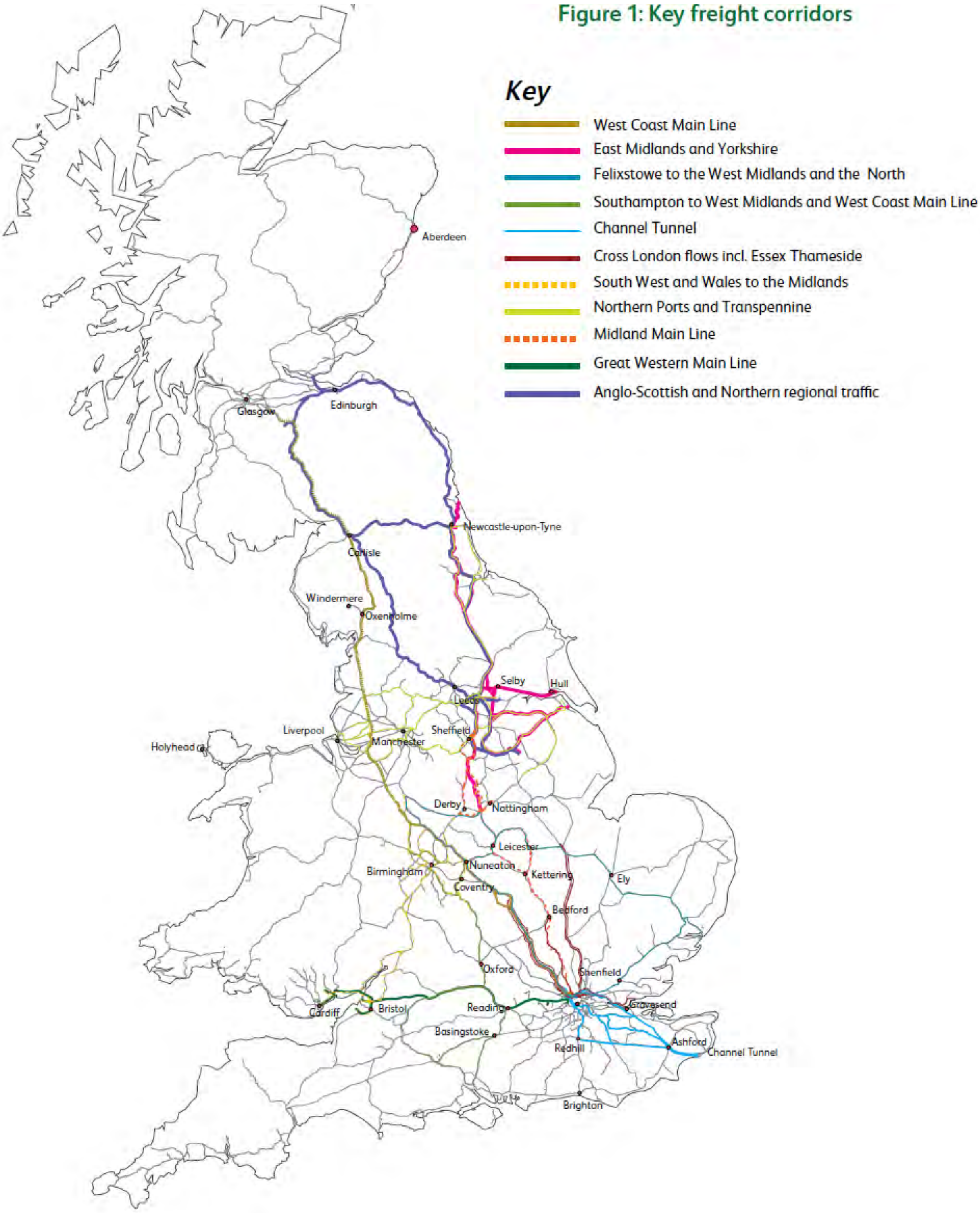
- *Impact on congestion of transfer of freight from road to rail on key strategic corridors*, MTRU (March 2017)
- *Supplementary report on environmental and safety impacts of the transfer of freight from road to rail on key strategic corridors*, MTRU (December 2017)
- Useful Facts and Figures: http://freightonrail.org.uk/FactsFigures.htm
- *Heavy Lorries: do they pay for the damage they cause?*, MTRU (2008)

ORR

- Rail Freight Usage, ORR Data Portal: https://dataportal.orr.gov.uk/browsereports/13

ANNEX II – MAP OF STRATEGIC FREIGHT CORRIDORS

Figure 1: Key freight corridors



Transport for London

Sir John Armitt CBE
Freight Study Call for Evidence
National Infrastructure Commission
5th Floor
Eastcheap Court
11 Philpot Lane
London EC3M 8UD
Email: Freightstudy@nic.gsi.gov.uk

Transport for London
City Planning

5 Endeavour Square
Westfield Avenue
Stratford
London E20 1JN

Phone 020 7222 5600
www.tfl.gov.uk

27 March 2018

Dear Sir John,

Freight Study Call for evidence: National Infrastructure Commission

Thank you for the opportunity to submit evidence to your review into the economic role of freight.

As part of the Greater London Authority family of organisations led by the Mayor of London, Transport for London (TfL) is the integrated transport authority responsible for delivering the Mayor's strategy and commitments on transport. Our operational responsibilities include London Underground, London Buses, Docklands Light Railway, London Overground, TfL Rail, London Trams, London River Services, London Dial-a-Ride, Victoria Coach Station, Santander Cycles and the Emirates Air Line.

On the roads, we run the Congestion Charging and Low Emission Zone schemes, manage the city's 580km red route network, operate all of the Capital's 6,300 traffic signals, work to ensure a safe environment for all road users, and we regulate taxis and the private hire trade. We work closely with the freight industry, boroughs and other stakeholders to develop and implement policy, guidance and support aimed at making freight more efficient, safer and less polluting.

As a core element in the Mayor's overall plan for London, our purpose is to keep London moving, working and growing, and to make life in our city better. We reinvest all of our income to run and improve London's transport services and to make it more modern and affordable for everyone.

Freight and servicing is essential to London's economy. Half of London household expenditure (£79 billion in 2013) relies on road freight. Freight trips make up a significant and growing proportion of London's traffic. In the AM peak, HGVs and vans make up 22 per cent of traffic entering greater London and a third of the traffic entering the congestion charging zone. Eighty per cent of freight kilometres are vans and 20 per cent are HGVs. HGV trips are forecast to remain steady to 2041, but vans are forecast to rise by 26 per cent, representing 77 per cent of total trip growth in London. LGVs (light goods vehicles under 3.5 tonnes) were responsible for 14 percent of total vehicle kilometres in London in 2016[1], up from 11 percent of total vehicle kilometres in 2000. Travel distances have also increased as a result of the increasing cost and limited supply of logistics land.

Since 2012, targeted programmes have been implemented to reduce the impact of freight in London and improve efficiency. These have focused on improving safety and air quality and reducing congestion. Safety initiatives include the Fleet Operators Recognition Scheme (FORS), Construction Logistics and Community Safety (CLOCS) and implementing a Direct Vision Standard for HGVs to reduce the danger to vulnerable road users. The Low Emission Zone (LEZ) was introduced in 2008 to encourage the most polluting heavy diesel vehicles driving in the Capital to become cleaner. The T-Charge (or Emissions Surcharge) was introduced in October 2017 to improve air quality by reducing especially nitrogen dioxide (NO_2) and particulate matter. It applies mostly to petrol and diesel vehicles registered before 2006. The Ultra Low Emissions Zone (ULEZ) which will come into operation in April 2019, addresses vehicle emissions, including emissions from freight vehicles, while the LoCITY programme focuses on lowering emissions from Commercial Vehicles. Efficiency programmes include multi-year programmes to retime and consolidate freight and looking at area-based solutions to reduce delivery and servicing trips.

The Mayor's Transport Strategy (MTS) identifies freight and servicing as essential to ensure London's continued success as a place to live, work and spend time. However, to achieve wider MTS objectives, freight and servicing trips need to be made in ways which reduce their impact on safety, air quality and congestion. To this end, the MTS sets out proposals to reduce the impact of freight through action at the strategic network and at the local level. We are working with our delivery partners to move freight onto rail, water and other sustainable modes, encourage retiming and consolidation to reduce peak flows, and implement area-specific schemes to address road and kerbside congestion and to enable the creation of Healthy Streets.

In light of these challenges we have identified issues and suggested areas for the Commission to consider to improve the efficiency of freight in urban areas. These are detailed in the attached response and include:

[1] Travel in London, report 10, 2017

1. Strong support for mode shift to water and rail. This includes leading a stronger national-sponsored scheme to promote freight by water and investing in rail freight infrastructure

2. Devolved funding from the national Roads Investment Fund for London to invest in maintaining, renewing and enhancing the strategic road network

3. Consider potential benefits, approaches to and possible funding models for establishing regional and local consolidation centres

4. Supporting the development of ultra-low emission HGVs through research and infrastructure investment

5. Conducting further research into the role that vehicle technology could play in helping freight vehicles use the road network more efficiently

6. Conducting research into technology infrastructure and develop a vision that describes what the future technology architecture supporting freight could look like

We would welcome the opportunity to work closely with you to further develop our own understanding of this important area.

A detailed response to the call for evidence is attached. We would be happy to meet with you during your enquiry and to provide further information which may assist.

Yours sincerely

[Signature redacted]

[Name redacted]
[Job title redacted]
Email: [Email address redacted]
Direct line: [Telephone number redacted]

Appendix: Response to National Infrastructure Commission Freight Study Call for Evidence

1. **What are the key constraints to the effective and efficient movement of freight in the UK and how do we overcome them?**

Congestion is a major constraint affecting effective and efficient freight movement. In addition to growth in demand, factors affecting congestion on London's roads include decisions on mode choice, route choice, when trips occur and how well vehicle capacity is utilised. Poor data and limited sharing of data and plans also affects efficiency as businesses optimise their own networks but don't consider broader optimisation opportunities such as consolidating freight to reduce trips. Regulations limiting vehicle size are also a constraint.

The Centre for Economic Research identified that the annual cost of congestion in London was £2 billion. This highlights the need for urgent action. London is, through the Mayor's Transport Strategy (MTS), implementing measures to reduce congestion through mode shift and by improving the efficiency of freight efficiency on our network.

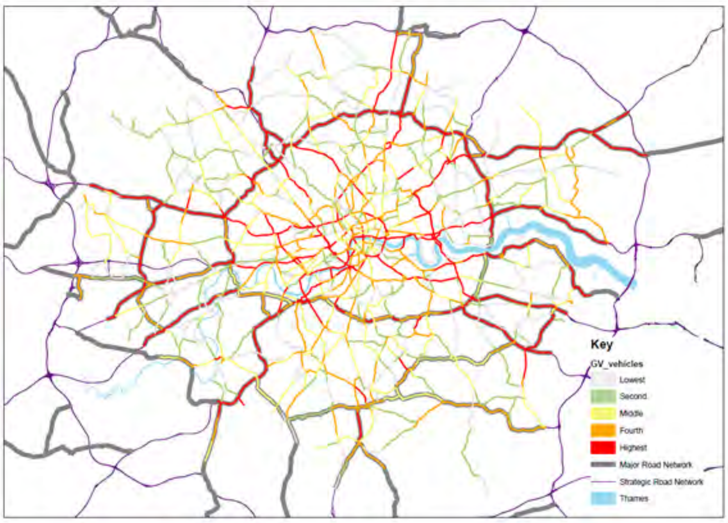
The MTS outlines actions to improve the effective and efficient movement of freight at two levels, namely: 1) adopting a strategic approach to improving the efficiency of the movement of goods and services across the transport network; and 2) at a local level, particularly in Central London and in town centres, take action to fundamentally change the way businesses and residents receive their goods and services.

London is a net importer of goods with most freight flow originating outside of the city. Infrastructure plans should adopt an integrated view of national and city-specific freight flows and the interface between these flows. Within London, currently 90 per cent of freight is by road, five per cent is by rail and five per cent is by water.

At a network level we are exploring more ways to shift freight from road to rail and water by encouraging more construction aggregates by barge and by exploring ways to use the Thames to deliver light freight. Shifting freight on to these modes will help to reduce congestion, enable more efficient freight movements, and reduce freight emissions. It is vital that planning regulations support the continued protection of London's wharves and that good access to them is maintained.

There is potential for more lighter goods to also be carried by water. However the potential for this is currently limited the lack of infrastructure to support the movement of these goods (eg via roll-on roll-off cages) from the water to land. A stronger national-sponsored scheme should promote freight by water and should consider both waterside and landside infrastructure requirements (eg waterside storage facilities).

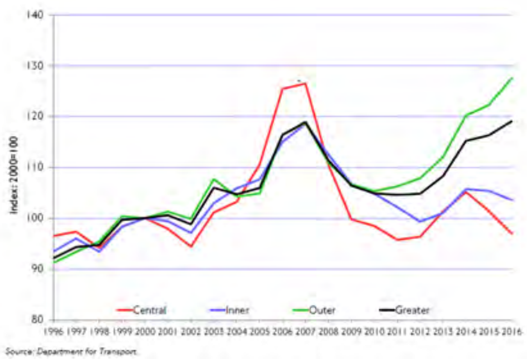
Growing passenger demand for rail services in London is constraining the capacity of the rail network to cater for additional freight trips. This problem is made worse by a number of freight trips not bound for London taking up valuable capacity on the rail network. Freight not bound for London should bypass London thereby freeing up capacity for freight and passenger trips serving the city. This will require investment from Government in the rail network. For example, the completion of doubling the track on the Felixstowe to Nuneaton line will reduce freight trains passing through London, freeing up rail paths for more passenger services on the North London Line. In addition action is needed to ensure full use of these alternative freight paths to shift more 'through freight' out of London. Furthermore, investment in rail intermodal facilities at strategic locations would enable more rail freight to be brought closer to its final destination, displacing many long-distance trips by road. Even with investment in rail and water freight, the majority of deliveries in London will continue to be transported by road. The map below shows key freight corridors in London.



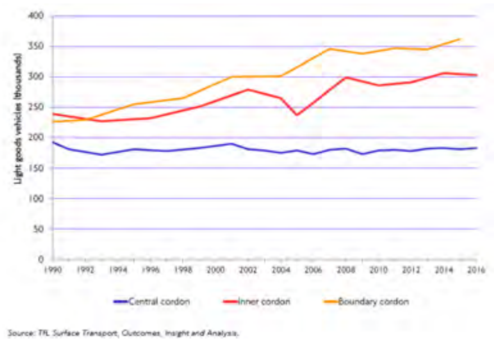
2. **How might the demand for freight develop and change over the next 20-30 years?**

In London during the AM peak, HGVs and vans make up 22 per cent of traffic entering greater London and a third of the traffic entering the congestion charging zone. Eighty per cent of freight kilometres are vans and 20 per cent are HGVs. HGV trips are forecast to remain steady to 2041, but vans are forecast to rise by 26 per cent, representing 77 per cent of total trip growth in London. LGVs (light goods vehicles (under 3.5 tonnes) were responsible for 14 percent of total vehicle kilometres in London in 2016[2], up from 11 percent of total vehicle kilometres in 2000. The majority of this growth is occurring in outer London.

LGV vehicle kilometres by zone in London



HGV vehicle kilometres by Zone in London



On the demand side, growing online sales, shifting population and other technology developments such as 3D printing will influence freight demand and how freight flows will evolve. The trend toward large and more automated distribution centres is likely to continue, supported by trunking routes using large HGVs. Short-haul distribution is likely to experience the biggest change. In addition to electric vehicles, alternative delivery modes such as drones will change established freight routes. Freight supply will be influenced by rising cost pressures and increased automation across the supply chain.

The way the retail trade operates has already changed. Online sales reached £133 billion in 2016[3]. This is changing the way freight is delivered. The rise of online retail sales is leading to order fulfilment being shifted from local stores to large (sometimes regional) distribution centres. We expect that more freight will be delivered by smaller vehicles, on demand and within hourly timeframes. LGVs make up over 80 per cent of freight traffic in the morning peak and over 90 per cent in the afternoon peak[4]. Van growth will continue and we predict that they will increase by 20 per cent over current levels by 2031. At the same time the HGV vehicle population has decreased.

The effect of Brexit on London's economy and freight movements is yet unknown. Removal from the single market may require the development of inland ports. This would require new infrastructure and support systems to cope with changed freight flows and customs inspections.

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[2] Travel in London, report 10, 2017

[3] IMRG Capgemini eRetail Sales Index

[4] TfL LVAT data

Consolidating freight can improve freight efficiency and, under certain conditions, can increase freight efficiency without increasing cost. Regional consolidation centres could meet these conditions as they are typically situated away from expensive land and could provide sufficient returns to scale to justify setup and operating costs. The Commission should consider potential benefits, approaches to and possible funding models for establishing regional consolidation centres. This development, together with larger HGVs could reduce trips and encourage more out-of-hours deliveries into cities.

3. **What effect does congestion have on the efficiency of freight movements and emissions**

A study found that congestion costs from freight traffic were, on average, about 3.5 times more per vehicle kilometre than other traffic in London[5]. It is estimated that the annual cost to the freight industry of delays is £2.1 billion in London[6]. To meet service requirements, operators often deploy additional vehicles, further adding to congestion.

Newer HGVs and LGVs produce lower emissions but freight still makes up 35 per cent of all road-based NOx. We have modelled real-life traffic emissions under different speed and traffic conditions, and these results are available. One study examined NOx emissions for specified drive cycles for petrol and diesel light vehicles at 20mph and 30mph. It found that PM_{10} and CO_2 emission factors were lower for petrol and diesel vehicles at the lower speed (except for vehicles with engine size over 2.0 litres).

Reducing congestion would unlock better use of urban spaces, support efficient freight movements and help to reduce emissions. In London we are seeking to shift more freight off the road network to water and rail (see above). We are also working to encourage deliveries away from the busiest times. The MTS has set a target to reduce the number of lorries and vans entering central London in the morning peak by 10 per cent by 2026. One of the key barriers to this is the lack of suitable locations around London for drivers to rest. The Commission should investigate establishing lay-by areas on key corridors outside London. These would provide a better opportunity for drivers to stage deliveries away from busy periods. The provision of these areas would also help to improve compliance with regulations around drivers' hours.

TfL will be publishing a Freight, Deliveries and Servicing Action Plan this summer which will set out our approach to improving the efficient movement of freight in London.

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[5] The economic value of freight transport in London (unpublished), March 2017

[6] Centre for Economics and Business Research, 2013

4. How can freight reduce its carbon and air quality impacts?

Freight movements should as far as possible be shifted to the lowest carbon modes of transport, such as cycle freight for last mile and rail freight. Government should set out its position on the long-term technology trajectory for reducing CO_2 emissions from HGVs, in particular:

- Supporting the development of ultra-low emission HGVs through research and infrastructure investment
- Clarifying its long term position regarding the use of alternative fuels in road transport which will allow operators to make better-informed investment decisions
- Identifying and addressing measures to reduce plastic packaging throughout the supply chain

Particulate matter emissions from vehicle tyre and brake wear make up an increasing proportion of road transport air pollutants as exhaust emissions are reduced. Government should support the development of new technologies to seek to reduce these emissions from freight vehicles. We commissioned research to estimate emissions from diesel auxiliary engines for temperature controlled transport. Results indicated that auxiliary engines emit at least 30 times more PM and 4.5 times more NOx per kWh than the traction engines used by HGVs. We propose the following:

- A review of the permitted use of duty-free ‘red’ diesel (HMT)
- An assessment of the feasibility of phasing out diesel auxiliary engines (DfT)
- Including auxiliary engine emissions in zero emission road transport and air quality plans (DfT/Defra)
- Providing funding for in-fleet trials of new technologies (InnovateUK/OLEV)

5. How could new technologies increase the efficiency and productivity of UK freight?

Autonomous vehicle technology could support more sustainable and efficient last mile deliveries if incorporated with freight consolidation centres / drop-off points. Large HGVs, which take up lots of road space and contribute to congestion, can be removed for smaller autonomous (and electric) vehicles for efficient last mile deliveries.

Intelligent infrastructure can improve vehicle flows and provide routing alternatives. A Catapult-funded project[7] found that variations in choices made

[7] FTC 2050 project (www.ftc2020.com)

by the driver leads to variations of over three minutes per parcel in the time spent delivering each parcel delivered. Sourcing data (e.g. through vehicle telematics) can provide valuable information about how trips are executed and are especially useful for multiple drop deliveries. The Commission should consider how data, including telematics data from vehicles can be used to further improve the efficiency of freight operations. TfL have conducted trials and have valuable experience in this area.

Data from vehicles and connected infrastructure can help provide real-time traffic information, providing updates on optimal routing and condition of the road network. The Commission should conduct research into technology infrastructure and develop a vision that describes what the future technology architecture supporting freight could look like.

HGV platooning could increase the efficiency of freight deliveries by allowing two or more vehicles to be connected through vehicle-to-vehicle communication. The capability for constant speed along with brake efficiency could lead to more fuel savings and safer deliveries. However, in an urban context such as London, the benefits of platooning may be more challenging with more constraints on road space and conflicts with other road users. Regarding urban design and physical infrastructure, if drones and droids become increasingly used for last-mile deliveries, then more drop-off points and launch/landing pads may need to be incorporated into building and street design. The regulation of such activity needs to keep pace with changes in technology.

6. **What international experiences can the UK learn from to improve freight and reduce its carbon footprint**

A useful project to review is LAMILO (www.lamiloproject.eu/), a European Union funded project that brings experts together from all sectors of the freight transport industry to change behaviour of private companies, the public sector and consumers to make better use of existing transport infrastructure and networks. Work has included an interactive mapping platform for urban freight and utilising inner city rail connections for sustainable logistics in central London (Euston). A UK Engineering and Physical Science Research Council (EPSRC) funded project, PWC 2050 (www.ftc2050.com/) project is looking at last-mile logistics and tracks vehicle and walking activities for parcel deliveries in Central London with a view to optimising freight routes and delivery rounds.

There are also a number of international examples of good practice which TfL is watching with interest. Paris has introduced 'logistics hotels' where goods can be transported by rail to a warehouse that has shops and residential space above it. In Hamburg light goods are transported to the centre of the city by truck and stored overnight. They are then delivered on trollies by pedestrians. Singapore restricts freight traffic through the use of permits. Each freight company is issued with a limited number of permits to enter the Central Activity Zone. This forces firms to work with competitors to consolidate loads and reduce the number of trips.

The Mayors Transport Strategy and Healthy Street for London are useful reference documents. References for these are shown below

- The Mayor's Transport Strategy – https://www.london.gov.uk/sites/default/files/mayors-transport-strategy-2018.pdf
- Healthy Streets for London – https://tfl.gov.uk/cdn/static/cms/documents/healthy-streets-for-london.pdf