MPA Response to the Second National Infrastructure Assessment: Baseline Report

Introduction

The Mineral Products Association (MPA) is the trade association for the aggregates, asphalt, cement, concrete, dimension stone, lime, mortar and silica sand industries. With the merger of British Precast, and affiliation of the British Association of Reinforcement (BAR), Eurobitume UK, MPA Northern Ireland, MPA Scotland and the British Calcium Carbonate Federation, it has a growing membership of 520 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 the 9 major international and global companies. It covers 100% of UK cement and lime production, 90% of GB aggregates production, 95% of asphalt and over 70% of ready-mixed concrete and precast concrete production. In 2018, the industry supplied £16 billion worth of materials and services to the Economy. It is also the largest supplier to the construction industry, which had annual output valued at £172 billion in 2018. Industry production represents the largest materials flow in the UK economy and is also one of the country's largest manufacturing sectors.

Question 1

Do the nine challenges identified by the Commission cover the most pressing issues that economic infrastructure will face over the next 30 years? If not, what other challenges should the Commission consider?

Electricity

Challenge 2 considers the shift to renewable electricity and the baseline report mentions that future electricity demand will increase. In the 6th Carbon Budget, the CCC stated that the size of the electricity grid will likely need to double or even triple to meet the additional demand that electrification will bring as the economy decarbonises. This will require significant investment in grid infrastructure. The investment and roll out of this infrastructure to meet the demand across the UK must be considered, and in particular how the costs will be funded. It is important that costs don't land disproportionately on energy intensive industries (EIIs) and that they are not allocated without a full assessment of affordability and the impact on EII international competitiveness.

Raw materials

One missing challenge is to do with ensuring steady and adequate supplies of raw materials, in particular the mineral products essential for infrastructure projects including aggregates, asphalt, cement, concrete and lime. The supply of these materials cannot just be assumed as being readily available as and when required. New capacity can't simply be 'switched on' as it can take between 10-15 years to bring new mineral sites and reserves into production following extensive investment and planning.

Levels of 'permitted reserves' – minerals with planning permission to be extracted – are declining, whilst at the same time, demand is increasing for their use in construction. While the mineral products industry and the mineral planning system has so far largely managed to meet demand, the growing demands for construction minerals for major projects and business-as-usual activity coupled with the declining reserve base and a lack of strategic national coordination from Government is in danger of creating an unsustainable position for the years ahead. The most recent Annual Mineral Planning Survey (AMPS)

showed a ten-year replenishment rate of 76 per cent for crushed rock and 63 per cent for sand and gravel[1].

Extractive sites will require permits from the Environment Agency, and other environmental regulators in devolved nations, for managing water resources and waste activities. Currently, it often takes more than two years to obtain the permits required. This delay results in additional costs and causes extensions to the timelines of major and local infrastructure and housing projects.

If this situation is not addressed, costs and timelines of major and local infrastructure and housing projects will be affected this decade. This is avoidable. Our proposed solution calls for:

- A National Statement of Need for Minerals and Mineral Products to provide the context for adequate local provision;
- A published resource and supply chain assessment of mineral requirements for any major infrastructure project to inform forecasts of demand;
- Greater resourcing of the mineral planning system at national and local level to keep plans up-to-date and make timely decisions on planning applications, whilst providing greater certainty;
- Alignment of environmental permits and planning permissions to prevent duplication of regulation and delays.

Asset management

The issue of asset management is not explicitly recognised and this would be beneficial, in order to track the management of existing infrastructure, and would complement the 'design principles' challenge. The report itself notes the concerns that maintenance and replacement are not keeping pace with asset deterioration. This is exemplified in the 2021 ALARM survey by the Asphalt Industry Alliance that indicates that over £10 billion investment is needed to bring local authority roads into good condition[2]. A challenge dedicated to maintaining infrastructure assets would help ensure adequate investment in the face of climate change and so support infrastructure resilience.

Question 2

What changes to funding policy help address the Commission's nine challenges and what evidence is there to support this? Your response can cover any number of the Commission's challenges.

The introduction of five year cycles of funding for the Strategic Road Network, mirroring the investment cycle for rail, is welcome and could help deliver on urban and interurban mobility if well executed. We have made suggestions to the Office of Rail and Road and Treasury to introduce material supply audits and increase transparency in the project pipeline, both of which would support the supply chain to invest with greater confidence to meet demand.

For local roads, a similar approach would be extremely welcome. The Asphalt Industry Alliance ALARM survey highlights the need for adequate maintenance and repair budgets to ensure that existing assets are maintained to an adequate standard and provide a sound basis to meet future requirements (e.g. increased users, climatic change, increased flooding)2.

[1] MPA (2021), AMPS 2021 - 9th Annual Mineral Planning Survey Report, https://www.mineralproducts.org/Publications/Resource-Use.aspx

[2] Asphalt Industry Alliance (2021), Annual Local Authority Road Maintenance (ALARM) Survey 2021, https://www.asphaltuk.org/alarm-survey-page/

Question 3

How can better design, in line with the design principles for national infrastructure, help solve any of the Commission's nine challenges for the next Assessment and what evidence is there to support this? Your response can cover any number of the Commission's challenges.

In discussing net zero, the report concentrates on what the transport, energy and waste sectors need to do to reach net zero. This includes, for example, using zero emission vehicles and increasing renewable electricity generation. However, in a net zero world, the infrastructure itself, the roads, railways, bridges, sewers, etc., will need to be built using low carbon materials and operated with low carbon maintenance regimes. Mineral products make up a significant and vital component of such infrastructure and in 2020, the MPA published a roadmap[3] setting out how the UK concrete and cement sector can go beyond net zero by 2050. As well as significant investment from the manufacturers themselves, this also requires Government and others to take action to remove barriers to investment and ensure enabling infrastructure, such as CO_2 pipelines and hydrogen networks, are in place. The MPA roadmap shows what is possible, and the Commission can factor into its infrastructure assessments that in future, low carbon - or even net negative - concrete will be available for infrastructure construction.

Other product sectors are also actively transitioning towards net zero to meet Governmental client targets, such as those from National Highways, with net zero materials expectations by 2040. The combination of renewable, alternative and decarbonised energy and transport are essential to enable net zero outputs for infrastructure construction and maintenance, but much of this decarbonisation is outside of the control of material suppliers.

It is welcome that the 'Climate' design principle considers whole asset life. A focus on embodied carbon alone will not suit the needs of long term, resilient infrastructure and could lead to lower performing, higher whole-life impact projects. Many carbon management tools used to assess projects continue to rely on carbon footprints of materials, and potentially of installation equipment, rather than taking into account whole-life considerations. It would be helpful for the Commission to highlight and draw out the benefits of whole-life carbon assessment within its communications and the need to minimise both whole-life and embodied carbon, rather than placing reliance on embodied carbon alone.

Design inputs need to ensure that maintenance and replacement strategies (asset management) are compatible and traceable. For example, digital twins can provide an accurate record of all materials and activities throughout an asset's lifecycle.

Question 4

What interactions exist between addressing the Commission's nine challenges for the next Assessment and the government's target to halt biodiversity loss by 2030 and implement biodiversity net gain? Your response can cover any number of the Commission's challenges.

A steady and adequate supply of minerals and mineral products will be essential in the delivery and maintenance of infrastructure. Management of mineral extraction sites, with habitat creation before, during and following the extraction phase can and does create substantial areas of habitat for a wide range of species, delivering real and measurable biodiversity gain. The industry is uniquely placed to deliver biodiversity gain through development. To date, MPA members have created at least 83 sq km of

[3] MPA (2020), UK concrete and cement industry roadmap to beyond net zero, https://thisisukconcrete.co.uk/TIC/media/root/Resources/MPA-UKC-Roadmap-to-Beyond-Net-Zero_October-2020.pdf

UK priority habitats on minerals sites, with at least a further 110 sq km committed in approved restoration schemes.

These habitats deliver multiple benefits (and ecosystem services) including water storage and flood risk management, recreation and landscape improvements, as well as large biodiversity gains. These habitats are also carbon sinks and demonstrably more effective at carbon sequestration than agricultural land[4] [5] [6].

Question 5

What are the main opportunities in terms of governance, policy, regulation and market mechanisms that may help solve any of the Commission's nine challenges for the Next Assessment? What are the main barriers? Your response can cover any number of the Commission's challenges.

Environmental regulation - a barrier

Environmental regulation can create perverse incentives, with the fee structure favouring the use of primary materials over the use of wastes. The use of waste materials is associated with higher fees paid to regulators, as a result of the increased scrutiny irrespective of the quality of environmental management, the performance of the operator, or the overall benefit to the environment from the use. For example, the Environment Agency annual fees for manufacturing cement using waste materials are twice those for using primary materials; its fees for amending permits to enable the use of waste materials are around a quarter to a third higher than for amendments for sites not using waste materials. This will hamper investment in waste infrastructure and the effective use of wastes within the circular economy.

Timeliness is also a major barrier from regulator performance. For many years, it has taken more than 12 months for decisions to be made regarding the use of wastes due to the nature of the permitting system. For the UK cement sector, this actively dissuades businesses, potentially with international parents, from investing in the supporting on-site infrastructure to make projects happen. For example, delays of more than 12 months in permitting a minor technical variation application for a cement installation resulted in an additional 12,000 tonnes fossil CO_2 emissions, costing an additional £300,000 in CO_2 allowances, and resulting in increased transport emissions from coal import and waste export. The Environment Agency in particular are aware of the issues surrounding their permitting system, but despite action to address the issues since 2020, little progress has been made and limited reassurance offered to businesses. To enable the delivery of net zero/net negative infrastructure in the future, the nature of environmental regulation and its implementation needs a review to ensure it is fit for purpose and for the future.

Waste and biogas – a missed opportunity

Waste recycling in manufacturing is a missed opportunity, with policy perversely incentivising waste to less efficient and less environmentally beneficial outcomes. In October 2020, the UK concrete and cement industry roadmap to beyond net zero was published[3]. To reach net zero, the sector has ambitions to significantly increase its use of waste fuels and waste raw materials. As such, waste policies and market mechanisms need to take account of the productive use of wastes in cement manufacturing before decisions are taken to divert wastes to other uses.

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4 Natural England (2021), Carbon Storage and Sequestration by Habitat 2021, http://publications.naturalengland.org.uk/publication/5419124441481216;;

5 MPA (2021), Quarries & Nature - A 50 Year Success Story, https://mineralproducts.org/Publications/Natural-Environment/Quarries_and_Nature_50_Year_Success_Story.aspx

6 MPA (2021), MPA Quarries & Nature 2021 … A 50 year success story - Complete Show, https://www.youtube.com/watch?v=J3j54TrOvVs

Through its unique use of coprocessing, cement manufacture simultaneously utilises any energy value in wastes and recycles the mineral content into higher value cement products without producing any residual waste ashes that require disposal. As recognised by the Government Office for Science, cement manufacture forms an important part of the circular economy[7]. In 2020, the sector used 1.2 million tonnes of wastes as fuels and raw materials with alternative raw materials replacing 5% of primary raw materials and waste fuels making up 47% of thermal energy demand.

Government subsidies (e.g. feed in tariffs, legacy renewable heat incentives and the new green gas levy) distort the market by proactively diverting biogenic wastes from cement manufacturing to anaerobic digestion, and combustion in boilers. This makes achieving net zero cement manufacturing more challenging and reduces the potential for net negative cement.

Similar issues to waste apply to biogas, with poor incentives having perverse impact. Subsidies for the production of biogas or biomethane only apply if the gas is cleaned and injected into the gas grid or is combusted to make electricity – which means that it cannot be used for direct combustion with higher efficiency and better environmental outcomes. For example, biogas produced at lime manufacturing sites cannot be used directly, with minimal cleaning, to replace natural gas in kilns. This hampers the production of low carbon limes for use in soil stabilisation for infrastructure projects.

Reuse – a missed opportunity

Regulation also creates a barrier to enabling reuse of mineral products back into the same or similar products and for the same initial use. For example, asphalt planings from highways maintenance operations are largely reuseable back into new asphalts with minimal further processing but, because they are deemed as waste they fall into waste regulations. This means that operators seeking to re-use them have to be registered as waste processors, which brings increased cost and bureaucracy. If planings were considered as a by-product of the re-construction processes, their reuse could be facilitated more easily, with resultant carbon reduction benefits from replacing virgin materials at higher addition rates, enhancing circularity.

Hydrogen and CCUS – an opportunity to be taken

Challenge 4, relating to hydrogen and CCUS networks, will need to take account of the requirements for dispersed sites in rural locations to access these networks and plan how this might be achieved to make the most of the opportunity presented by these technologies. This is particularly the case for cement and lime manufacturing, which need CCUS to decarbonise process emissions (emissions from the thermal breakdown of raw materials) but where the majority of sites are located outside industrial cluster locations. It may be that additional rail lines or road links are required where pipelines are not possible.

Surface water management – an opportunity waiting to be taken

In terms of Challenge 6, the restoration of mineral sites can often involve the creation of wetland habitats. Similarly, where a site is adjacent to a river there may be the opportunity to restore the site to manage surface water (for example, river braiding). Mineral sites in areas that require flood alleviation should be considered as a potential opportunity for managing surface water.

[7] Government Office for Science (2017). From waste to resource productivity: evidence and case studies, https://www.gov.uk/government/publications/from-waste-to-resource-productivity

Question 6

In which of the Commission's sectors (outside of digital) can digital services and technologies enabled by fixed and wireless communications networks deliver the biggest benefits and how much would this cost?

Digital technologies are being developed to be embedded in physical infrastructure to better enable condition monitoring. Doing so offers the opportunity to more accurately and more quickly identify when assets are strained / near capacity or predict time to end of life. Identifying issues before they arise enables proactive maintenance to be carried out that is more cost efficient compared with, ultimately, reconstruction and/or removing assets from service. Embedded monitoring may potentially be complemented by active monitoring also supported by digital services, such as inertial sensors in vehicles directly reporting the effects of deteriorating or damaged road surfaces to asset owners, to initiate investigation and interventions. Automated condition inspection vehicles operating at traffic speed will rely on highly accurate location systems to ensure data is correctly managed and allocated for digital mapping to ensure the right treatment is applied in the right location. GPS location has been a feature of infrastructure construction for decades, but its applicability to automated equipment and processes is an emerging trend. The issue of automated guidance systems for vehicles is likely to require similar highly accurate positioning capability. While embedding technologies in physical assets may be an ideal scenario, ensuring they are not damaged in installation and operation, resulting in "drop-outs" of live data needs to be designed in, without compromising the asset performance.

Question 7

What barriers exist that are preventing the widescale adoption and application of these new digital services and technologies to deliver better infrastructure services? And how might they be addressed? Your response can cover any number of the Commission's sectors outside digital (energy, water, flood resilience, waste, transport).

Digital transformation typically significantly outpaces infrastructure provision transformation. Technologies that are currently affordable and compatible are likely to already be, or nearly be 'out of date' and require upgrades almost immediately. Infrastructure lifecycles far exceed those of digital assets.

Question 8

What are the greatest risks to security of supply in a decarbonised power system that meets government ambition for 2035 and what solutions exist to mitigate these risks?

Please see the response to question 10 below regarding how the fabric of our homes and buildings can play a role in demand side flexibility that could be very valuable as the imbalance between energy demand and renewable energy generation grows.

The mineral products sector faces particular challenges around remote sites and grid access. Minerals can only be worked where they are found, and mineral operations are considered a temporary use of land. Inadequate access to the electricity grid in rural areas where minerals operations are routinely located has resulted in many of our members being keen to invest in renewables on site. However, grid and planning constraints have made this much harder to deliver than it should be. Battery technology is still in its infancy, and it is hoped that in the short to medium term this will progress sufficiently to enable investment in renewable infrastructure to the wider benefit of society. Many sites are also off the gas grid, and some mobile construction equipment uses gas burners for heat. These needs will need to be

considered as heat transitions away from natural gas and LPG, to alternatives such as hydrogen and biomethane.

Question 9

What evidence do you have on the barriers to converting the existing gas grid to hydrogen, installing heat pumps in different types of properties, or rolling out low carbon heat networks? What are the potential solutions to these barriers?

Large parts of the country are already 'off the grid' for gas provision, particularly in rural areas where minerals operations exist. So it is not solely about converting what is (not) already there. Care should be taken when deciding whether to 'bury' one element of critical infrastructure (e.g. pipelines) in or under another element of critical infrastructure (e.g. roads) – the maintenance and upkeep of one may have impacts on the other.

It is also worth questioning the value of converting the entire gas grid to hydrogen in the context of scarce supply of hydrogen and substantial need for using it to directly replace fossil fuels in uses that cannot be electrified. For example, industrial processes where the hydrogen replaces coal, and heavy transport which may not be possible to be electrified, must be higher up a hierarchy of hydrogen needs than home heating that can be provided by electrification.

Question 10

What evidence do you have of the barriers and potential solutions to deploying energy efficiency in the English building stock?

Making sure the homes being built now are fit for the future means ensuring the fabric of our homes is resilient to climate change without causing an increase in fuel poverty. High thermal mass materials, such as concrete and masonry, can be used to even out temperature variations in homes so that less energy is required to heat them in winter but they are much less likely to overheat in summer.

Furthermore, concrete can be used for energy storage, so that our buildings can play a significant role in demand side flexibility[8].

Question 11

What barriers exist to the long term growth of the hydrogen sector beyond 2030 and how can they be overcome? Are any parts of the value chain (production, storage, transportation) more challenging than others and if so why?

This question has been considered from the point of view of a potential hydrogen consumer. The MPA has recently demonstrated the use of hydrogen in a cement kiln, a project that was funded through the BEIS Industrial Fuel Switching Competition. The MPA is also aiming to demonstrate its use in lime manufacturing during Q1 2022[9]. The greatest barrier throughout this work is the availability of hydrogen in

[8] 3E (2016), Structural thermal energy storage in heavy weight buildings- analysis and recommendations to provide flexibility to the electricity grid, https://cembureau.eu/media/sggkvt4t/3e_structuralthermalenergystorageheavyweightbuildings_2016-10-25.pdf

[9] BEIS (2020), Industrial Fuel Switching competition phase 3: successful projects, https://www.gov.uk/government/publications/industrial-fuel-switching-to-low-carbon-alternatives/industrial-fuel-switching-demonstration-successful-projects-phase-3

sufficient quantities at a competitive cost. The original design of the trials would have consumed more hydrogen than can currently be produced in the UK in the timescale required. This was for trials that would have lasted only a few days. The trials had to be redesigned so that the kilns are operating on hydrogen for a few hours only. The demonstration showed that the use of hydrogen alongside high quantities of biomass worked well for cement manufacture. Modelling for the lime sector suggests that the transition to hydrogen should be achievable on existing plant, and the full-scale demonstration hopes to validate the modelling. However, the projects have also demonstrated that for hydrogen to be a long term viable decarbonisation option for the sector, it must be produced in sufficient quantities, and delivered easily to site so there are no risks of supply interruption. Furthermore, this must all be done at a cost that is competitive with other low carbon forms of energy and with energy supplied to industrial competitors in other countries.

For industries looking to switch from high carbon fuels to hydrogen, early visibility of supply routes and infrastructure for hydrogen and when these will be available are also needed for long term growth in demand. This will enable industrial sites to incorporate the use of hydrogen into their long term decarbonisation and investment plans.

Question 12

What are the main barriers to delivering the carbon capture and storage networks required to support the transition to a net zero economy? What are the solutions to overcoming these barriers?

Carbon capture is the only way to reduce 70% of emissions in cement and lime manufacture that currently arise from the breakdown of calcium carbonate raw materials – process emissions. However, the majority of cement and lime plants are located in isolated rural locations away from the industrial clusters that are the current focus of such networks. These plants are an important part of the levelling up agenda because of their rural locations and the highly skilled employment they provide to local communities. Other than CCUS, there are no decarbonisation technologies that will help these plants meet the net zero challenge and enable them to operate competitively in a net zero world. Fuel switching alone will only ever reduce emissions by a maximum of 30% compared to today's level of emissions. The Commission's consideration of what actions are needed, where, when and how with regards to the delivery of the CO_2 infrastructure must include consideration of the other options available to different emitters and whether CCUS is their only option for decarbonisation. If CCUS is the **only** option, as with cement and lime manufacture, then linking such plants to the network should be prioritised over other emitters that may have more options available to them – for example – electrification.

Question 13

In what ways will current asset management practice need to improve to support better infrastructure resilience? Your response can cover any number of the Commission's sectors.

Please see the response to question 6 – digital monitoring should enhance asset management practices. Enhancing resilience and enabling more timely and cost effective maintenance and management of assets saves cost in the long term.

Question 14

What are the barriers to and solutions for expanding recycling capacity, both now and in the future to deliver environmental and net zero targets?

Construction, demolition and excavation (CDE) waste is a good example of a stream that is close to fully exploited for recycling into secondary materials[10] [11]. The recycled aggregate market fluctuates according to construction activity but there is little remaining expansion potential. For the whole economy, there is no comprehensive data on the true amount of waste recycling which takes place in the UK.

More broadly, there is far more that could be done to raise waste up the waste hierarchy; from landfill, waste incineration – with and without energy recovery - to coprocessing in cement plants, where the mineral content of the waste is recycled into cement product, and simultaneously, the energy from the waste is used to replace fossil fuels such as coal, all without producing residual ashes for recovery or disposal. However, there are policy and regulatory barriers that currently prevent the benefits of coprocessing from being maximised. Policy barriers include pushing the waste to numerous smaller consumers through incentives that the cement sector can't access. Over the last 10 years waste biomass use in the UK cement sector has only increased 1% overall and the industry's use of 100% biomass fuels have decreased from 6.5% of the thermal input to only 3.6% in 2019. The reason for this is that policies including Contracts for Difference, Renewables Obligation, the Renewable Heat Incentive (to be replaced with its successor scheme, the Green Gas Support Scheme) are diverting waste to energy generation, Combined Heat and Power (CHP) and Anaerobic Digestion (AD).

In addition, cement manufacturers face regulatory delays and barriers when trying to introduce new wastes as fuel or raw materials on site. The process for getting consent for this must be accelerated. Overall, the regulatory system is in need of reform to encourage the use of wastes as primary materials and remove the cost and philosophical regulatory barriers to recycling. This is described in more detail in the response to question 5 along with additional comments on maintenance activities which can give rise to potential resource, not waste. There is a need to reconsider the classification as waste of materials that are routinely reused / remanufactured with unnecessary bureaucracy that could be avoided through their definition as by-products.

Question 15

What is the likely environmental impact of waste streams from construction across economic infrastructure sectors, over the next 30 years, and what are the appropriate measures for addressing it?

Defra data indicates that 76% of construction, demolition and excavation (CDE) waste is already used positively though being recycled or used in restoration of land[10]. Recycled aggregates comprise around a third of all construction aggregates supply and this is likely to be the maximum level achievable given the characteristics of recycled aggregates and their uses in different applications[11]. Inert CDE waste plays an important role in the restoration of mineral extraction sites, including through raising levels to enable restoration to agriculture, built development, or more usually creation of priority habitats and contribution to UK objectives for biodiversity. To date, MPA members have created over 80 sq km of UK priority habitat with a further 110 sq km committed in approved restoration plans.

Regulation of the CDE waste stream is essential to prevent illegal deposits and mis-classification of waste. The current consultations on digital tracking of waste and waste carriers and brokers should go some way

[10] MPA (2019), From Waste to Resource, https://mineralproducts.org/MPA/media/root/Publications/2019/MPA_Inert_Waste_Feb2019.pdf and

[11] MPA (2020), The Contribution of Recycled and Secondary Materials to Total Aggregates Supply in Great Britain in 2018, https://mineralproducts.org/MPA/media/root/Publications/2020/Contribution_of_Recycled_and_Secondary_Materials_to_Total_Aggs_Supply_in_GB_2020.pdf

to assist this. Waste crime is a problematic area, and more regulation is needed to bring those operating illegally to account.

Long life-span assets need to be recyclable at the end of their life – and for assets constructed now, that may be decades into the future. The recovery of materials into construction is well known – cement is made using alternative raw materials and fuels, slags and ashes find use as aggregates and binders, and the UK leads the way in the recovery of inert CDE wastes back into construction. However, caution should be exercised to avoid viewing infrastructure projects and construction materials as a universal route for waste recovery. Mineral products are highly specified, manufactured materials that meet established performance criteria. Whilst these performance criteria may be maintained when new waste streams are included, and potentially the embodied carbon of the product decreased, the recyclability of the material and the whole-life carbon may be compromised. Such perverse outcomes can be avoided by ensuring the design focuses on whole-life carbon and considers future recyclability as well as asset performance.

Question 16

What evidence is there of the effectiveness in reducing congestion of different approaches to demand management used in cities around the world, including, but not limited to, congestion charging, and what are the different approaches used to build public consensus for such measures?

No comment.

Question 17

What are the barriers to a decision making framework on interurban transport that reflects a balanced approach across different transport modes?

The key challenges on a decision making framework is the length of time taken to plan, design, and build any major project set against changes in government and technology which happen on very different timescales. Credible commitments from Governments announcing schemes are important, but it would be helpful to have greater transparency as projects progress through the pipeline.

Five-year budgets for road and rail networks are welcome, and should be extended to local roads, but do not in themselves guarantee delivery of projects to time.

It is important to deliver the right modal mix for each flow, including freight. This includes protecting freight terminals and wharves in cities.