

## Introduction

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

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

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

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

## Large-scale transport infrastructure improvements in London

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

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

The dense clustering of businesses in the centre creates synergies (agglomeration benefits) that make Inner London one of the most productive regions in Europe<sup>1</sup>. These synergies are dependent on a network that efficiently moves millions of people per day to and from their place of work. Despite technology being available for employees to work remotely, strong demand for office space in Central London demonstrates that being physically present is as important as ever and the need to move large numbers of people to and from their places of work will likely persist.

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

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

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

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

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

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

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

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

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

A key issue facing London in the future will be to find the space to accommodate a workforce that is expected to increase by one million over the next two decades<sup>2</sup>. More people will put substantial pressure on London's already strained road network and pedestrian walkways, particularly in Central London. The historic layout of the city centre means that there is limited scope to expand road capacity. Strategy will therefore need to consider options that allow more efficient usage of existing roads, cycleway and pedestrian walkways supported by investment in smart road signalling technology and expansion of the cycle rental scheme and the cycle superhighways network.

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

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

More generally, the DfT transport appraisal guidance (WebTAG) provides a robust and comprehensive framework that is comparable to the best in the world<sup>3</sup>. Recent changes have seen wider economic benefits appraised as part of the framework alongside direct transport user benefits. This represents a major step forward for the appraisal of major transport projects. However, it is acknowledged by the DfT that in some circumstances, the appraisal framework does not fully capture the economic growth impacts of transport projects<sup>4</sup>, particularly large projects

<sup>2</sup> GLA Economics, 2015, Updated employment projections for London by sector, Greater London Authority.

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

<sup>4</sup> Department for Transport, 2013, Understanding and Valuing the Impacts of Transport Investment, DfT.

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

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

From CH2M's own experience in delivering some of the UK's largest infrastructure projects, and reflected in DfT's 2014 commissioned report<sup>5</sup> on how to extend and improve appraisal techniques in order to fully capture economic impact of transport investments, it is acknowledged that new techniques will be needed to fully account for the all economic impacts of projects such as Crossrail 2. This will involve quantifying the 'real economy' impacts of proposed interventions, covering the interactions between infrastructure, land use and spatial development. This will require using models that predict changes in land use associated with the transport intervention and the resultant uplift in land value, as well as Spatial Computable General Equilibrium (S-CGE) models, which has been used in support of our work for Lower Thames Crossing, that measure the true impact of strategic transport investments at regional and national economies.

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

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

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

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

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

One option that would have important benefits for transport infrastructure funding would be the devolution of some taxation powers to London. London is more dependent on central government funding and has much lower levels of fiscal autonomy than other major international cities such as New York or Paris. A 2013 report commissioned by the London Finance Commission<sup>7</sup> shows that London collects the lowest municipal taxes per

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

<sup>6</sup> PwC, 2014, Crossrail 2 Funding and Financing Study, TfL.

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

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

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

Capturing land value uplift attributed to improved transport accessibility in station catchment areas could provide an alternative funding stream if it can be captured through Stamp Duty Land Tax and Council Tax increments. A report by GVA<sup>8</sup> predicts that Crossrail will increase residential capital values around stations on the route by between 20% and 25% up to 2021. Capturing such increases in capital values will of course be dependent on the regional devolution of powers to collect this revenue.

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

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

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<sup>8</sup> GVA, 2012, Crossrail Property Impact Study, Crossrail.