

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 infrastructure requirements for Connecting Northern Cities. We have made separate submissions outlining our views for infrastructure priorities for London and electricity interconnection and storage.

Connecting Northern Cities

Q1 – To what extent are weaknesses in transport connectivity holding back northern city regions?

The north of England currently suffers from some acute transport connectivity issues. In particular, the North East, centred on Newcastle, is poorly connected to the rest of the Northern Powerhouse. At the same time, poor Trans-Pennine transport provision across all major modes means that connectivity between the north of England's east and west is also weak. Within this context, it is understandable that there is significant concern around whether transport connectivity is preventing northern city regions from realising their full economic potential.

From CH2M's experience of assessing the economic impacts of major transport schemes in the north of England and elsewhere we have seen first-hand the impact poor connectivity has on economic performance. This is related to a number of factors including:

- Imbalances in the labour market, meaning it is difficult to reconcile labour supply with labour demand.
- Productivity inefficiencies around factor mobility (including journey time delays for labour and raw materials).
- Increased difficulty in reaching consumer markets.
- Inability to capture agglomeration benefits.

It is clear that for various measures of productivity, the major cities in the north of England are outperformed by London and other areas in the south. For example, in terms of GVA per Job¹, the Local Enterprise Partnerships (LEP) representing the north of England's major city regions are underperforming relative to many southern city regions. With a GVA per Job value of between £39,700 and £43,800, the major city region LEPs in the north trail benchmarks for London (£66,400), Oxford (£50,400), Bristol (£49,000) and Birmingham (£44,900).

Transport infrastructure can be a key driver and enabler of economic transformation and that it provides opportunities to overcome the economic constraints described in the bullet points above. However, it should be understood that transport connectivity is not the only contributory factor to poor economic performance in some northern city regions. At the same time, improving transport connectivity should not be considered as a panacea for improving the north of England's economy. In truth underlying structural issues surrounding various demographic, socio-economic and macro-economic factors are influential in understanding the north of England's economy, and improving its performance in relation to other regions.

¹ ONS, Nominal (smoothed) GVA per filled job (£); Local Enterprise Partnerships, 2002 - 2013

In particular, CH2M-sponsored research² reveals that beyond physical infrastructure, human capital, measured in terms of skill or qualification level or educational attainment, is a key factor resulting in differences in economic performance of the north and south of England. The proportion of residents in the north's major city regions with no qualifications is consistently way above the London average, and in the case of Sheffield is up to ten percentage points higher³. At the same time, the proportion of residents with degree-level qualifications (i.e. NVQ Level 4+) is some fifteen percentage points lower for northern city regions relative to London. This is despite a concentration of world renowned universities in northern city regions and a total student population of well above 500,000⁴.

The inability of northern city regions to retain the skilled population base that exits the range of higher education institutions relates to the unbalanced geographic distribution of economic sectors at a national level⁵. There is a concentration of high-skilled and high-valued sectors in London and in the South in general. Cluster development within these sectors is required in northern city regions to encourage business relocation or expansion to these locations and retention of the regions' skilled workforce. Improving connectivity in the north of England to target creation of clusters of high value adding sectors of economic activity, will support creation of demand for the skilled workforce being developed at the region's higher education infrastructure. The investments could encourage businesses to relocate to the northern city regions by enhancing agglomeration and productivity impacts and generating a more attractive business environment.

Improving connectivity within the north of England could also increase accessibility to London and the South. Within this context, if the region fails to capture the opportunities offered by strategic infrastructure investment and create demand for its high-skilled labour supply within the north itself, the impact on its economy could be worse. In particular, it could further increase out-commuting and out-migration and further reduce containment of skilled workforce, which could worsen economic divide.

This suggests that improving transport connectivity cannot overcome all of the deep-rooted issues that underpin poor economic performance in some northern city regions by itself. As such, it is essential that transport connectivity improvements occur simultaneously with other initiatives that attempt to address the underlying structural imbalances in the economy (such as incentivising business relocation, provision of business incubation units etc.). This would provide more certainty that the positive impact of improving transport connectivity on northern city regions is maximised. To this end, an integrated solution that draws upon the experience and expertise of a cross-departmental group of advisors may be required to alleviate the poor economic performance of northern city regions. This approach would combine investment in skills, promotion of the north of England as a business destination and devolution of major decision making powers, as well as investment in transport connectivity.

Q2 – What cost effective infrastructure investments in city-to-city connectivity could address these weaknesses?

Connectivity is defined by the time journeys take, the capacity to make these journeys and the quality of the end-to-end journey experience.

CH2M's experience in developing inter and intra-city public transport systems suggests that projects aimed at reducing public transport journeys are a cost effective way to boost connectivity. In particular, relatively small-scale initiatives including the provision of real time information and integrated smart ticketing systems can have a significant effect on reducing journey times, journey reliability and overall journey quality. In particular, evidence from public transport improvements in the West of England sub-region reveal that new employment opportunities can be created for every £400,000 worth of journey time savings⁶. Similarly, journey time savings and increased satisfaction with public transport acts to widen the labour market, linking firms to a greater catchment area in terms of employers and consumers. This can improve the attractiveness of a location, allowing more northern cities to become viable competitors to London and the South East.

One of the most significant transport investments required to improve city-to-city connectivity is improvements to the Trans-Pennine road and rail services between Manchester and Leeds/Sheffield. A number of studies are already underway looking at long term infrastructure investment to improve Trans-Pennine links, not least the

² Wilson, Gary, 2015. 'Does Wage Inequality Have a Spatial Dimension Driven by the North/South Divide?' Master's Thesis, MSc Development Economics, University of Birmingham 2015

³ 2011 Census, Table KS501EW - Qualifications and students

⁴ Higher Education Statistics Authority, 2013/14

⁵ Gardiner, Martin, Sunley and Tyler, 2013. "Spatially unbalanced growth in the British economy," Journal of Economic Geography, Oxford University Press, vol. 13(6), pages 889-928, November.

⁶ Based on the MetroWest scheme, using a 60 year discounted cashflow appraisal period.

feasibility of a Trans-Pennine Tunnel. However, given the engineering requirements for road and rail schemes and the extent of electrification and new rail line requirements to achieve the desired journey times between these cities, such infrastructure schemes would require significant expenditure.

CH2M have recently advised the DfT on the letting of the Northern and TransPennine rail franchises. These franchise awards will see significant investment in rolling stock quality and capacity in the next 5 years. The implementation of these capacity improvements need to be carefully managed in order to maximise the connectivity benefits. These capacity improvements would relieve some pressure on the network in the short term, providing more time for full appraisal of major, aspirational infrastructure schemes such as the Trans-Pennine Tunnel and HS3; significant journey time improvements as well as capacity need to be improved to create a binding economic entity.

Q3 – Which city-to-city corridor(s) should be the priority for early phases of investment?

In our opinion, the investment strategy should focus on some key early wins as well as strategic corridor improvements. Upcoming rolling stock investment and the implementation of the Smart Motorways concept will provide the early wins for the key city corridors in region, by quickly creating additional capacity to facilitate growth.

Following this, priority should be placed on improving strategic Trans-Pennine links, particularly between Manchester and Sheffield/Leeds. These projects are likely to be long-term and require significant capital investment. These projects should be the priority for first phases of new investment, and may help to address barriers to east/west movement in the north of England. Currently, despite the relative proximity between Manchester and Sheffield/Leeds commuter patterns suggest that a segregated labour market exists, divided along the historic county boundaries of Yorkshire and Lancashire. For example, data⁷ indicates that there are only 2,000 commuter trips across the Pennines between Manchester and Leeds/Sheffield. The quantity of trips between Leeds and Manchester in particular is some 40% lower than what would be expected based on population and physical distance alone. In contrast, there are 2,500 trips between Liverpool and Manchester and 3,600 trips between Leeds and Sheffield. This geographic labour market split does not reflect or contribute towards the unified, single economy vision that the Northern Powerhouse is striving for. It also impinges on the ability for the major city-regions to benefit from agglomeration impacts and associated knowledge sharing, productivity increases and increased competitiveness.

Other key city-to-city corridors that should be prioritised include links between Leeds and Sheffield to Hull, to take advantage of the major port complex and international connectivity provided at this location. This could help to enhance access to key consumer markets internationally for productive industries in Leeds and Sheffield. Further, the city of Newcastle is geographically isolated in the context of the Northern Powerhouse, with limited labour market penetration beyond its immediate hinterland. Commuter patterns taken from the 2011 Census indicate that there are fewer than 500 trips between Newcastle and the north of England's other major city-regions, suggesting a degree of economic as well as geographic isolation. As a consequence, city-to-city corridors that improve linkages between Newcastle and the other major city-regions that form the Northern Powerhouse should be considered as an investment priority. This would allow the whole of the north of England and businesses considering relocation to the region to benefit from a number of factors which provide Newcastle and the North East's with competitive advantage relative to other locations. These factors include average salaries, property costs and housing prices, which are significantly lower in the North East compared to the rest of the UK.

Q4 – What are the key international connectivity needs likely to be in the next 20-30 years in the north of England? What is the most effective way to meet those needs, and what constraints on delivery are anticipated?

The north of England is home to major port facilities at Immingham, Hull and Liverpool. These ports provide important links to some of the UK's key trading partners, including North America, mainland Europe, Scandinavia and Ireland. Immingham is currently the largest port in the UK by volume whilst the importance of the ports of Hull and Liverpool are expected to increase dramatically given their designation as nationally recognised Enterprise Zones. The Port of Hull will also perform a pivotal function supporting the UK's renewable energy sector. To exploit the potential of these key ports in serving key international markets it is essential that investment takes place in both on-site port infrastructure and off-site road and rail infrastructure. Improving road and rail links around the ports of Hull and Liverpool are critical, especially in Hull where the current highway network requires port traffic to travel through the city centre leading to significant congestion and delays.

⁷ 2011 Census, Journey to Work

Highway improvements are already underway at Immingham, which has benefitted from Highway England's Delivery Plan 2015-2020 via upgrading of the A160/A180 links.

Improvements in rail freight infrastructure can also play a crucial role in removing container traffic from the highway network. Whilst all of the major Ports are currently linked to the national rail network, not all lines are gauge cleared and are therefore unsuitable for rail freight traffic. Whilst the process of gauge clearance for rail freight is expected to be delivered across most of the north of England in line with electrification proposals and implementation of the wider Strategic Freight Network, Trans-Pennine rail freight movements may continue to be constrained.

The UK's third busiest passenger airport, Manchester Airport, also contributes significantly to the north of England's international connectivity. It provides links to more than 200 destinations, including links to strategic business locations including China, Hong Kong and North America. However, as per the northern sea ports, the supporting rail and road infrastructure around Manchester Airport is considered a constraint on continued growth. Within this context, major infrastructure projects are already underway on the local highway network to improve the Airport's accessibility (e.g. A6 to Manchester Airport link road). Similarly, improved rail access to Manchester Airport is at the heart of the developing Northern Powerhouse Rail Network. This recognises the importance of linking the airport to all of the main northern city regions.

Q5 – What form of governance would most effectively deliver transformative infrastructure in the north?

Transport for the North (TfN) was established in March 2015, with a clear mandate to oversee investment in transport infrastructure in the north of England by facilitating collaboration at all levels. In our opinion, so far, TfN has been an effective body in implementing the Northern Transport Strategy, and appears to be the right delivery vehicle to ensure joined-up implementation of strategic infrastructure packages in the region.

Previously, the north of England was a disaggregated network of various LEPs, county, unitary and metropolitan authorities, public transport executives and strategic transport providers. The establishment of TfN, which includes local, regional and national representation, comprising of local authorities, LEPs, Network Rail, Highways England, HS2 Ltd and other relevant stakeholders, represents an important step in devolving decision-making responsibility to the Northern Powerhouse. In particular, creation of TfN and making it accountable for infrastructure delivery in the north of England will enable decision making to be managed more efficiently through a single body, providing a united voice. Equally, it also represents an opportunity to consolidate governance of infrastructure investment to a single body, where partners can pool resources to meet common goals and projects developed through consensus.

To support this the Government has committed to providing a direct allocation of £50m towards TfN's budget. Other funding could be sourced via a number of mechanisms. There may be potential to attract some further match funding through central government departments such as DfT, BIS and CLG. Considering the increasing competition for central government monies, such funding is very likely to be project specific and would require appropriate business cases and economic appraisals to underpin the requested allocation.

TfN also provides an opportunity to pool some financial resources. Much like central government 'departmental' match funding, this is likely to be project specific and agreed through economic and affordability assessments. That said, there may be merit for TfN and its partners to consider a memorandum of agreement, even at this early stage, to ensure commitment for joined-up investment in transformative infrastructure for the north of England.

Business rate retention from local authorities who benefit from transport investment may also be a source of additional funding, particularly where transport investment supports the development of Enterprise Zones. A Revolving Infrastructure Fund could be established which allows investment in transport projects to be repaid via subsequent uplift in business rates retained by local authorities. Developer contributions could also be guided towards TfN where appropriate. For comparison purposes, Transport for London (TfL) secures around 23% of their funding from these various central and local government programmes, although it is important to note that TfL has a primarily strategic role compared to the strategic and operational role of TfN.

Considering the scale of undertaking to coordinate investment for major infrastructure projects, there may be merit in reviewing the appropriateness of a special purpose vehicle (SPV), solely responsible for raising and managing public sector and private sector funds to allow TfN to deliver the transformative projects. Some of these projects, once match funded, could be income generating assets with a market value. Adding programme management expertise, including project structuring, marketing and sale, could help TfN and partners to reap benefit beyond those offered by the fore-mentioned revolving infrastructure fund. We are able to provide case study based evidence on such delivery mechanisms, demonstrating their typical legal and organisational structures, along with the added value they can offer for managing finances of large scale infrastructure packages.