steer davies gleave

Transport Constraints and Opportunities in the North of England

Report
October 2014

HS2 Ltd

Our ref: 227/3/65/01
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This Report

In July this year Sir David Higgins was asked by the Secretary of State for Transport to produce ambitious proposals for connecting the cities of the North of England. As part of a wider programme of developments to HS2, he has been asked to look into how to bring the benefits of high speed rail to the North more quickly, as well as at proposals for faster east-west connections. Sir David was asked to report to the Secretary of State in advance of the Autumn Statement.

To support Sir David's report, HS2 Ltd commissioned Steer Davies Gleave to consider the transport constraints faced by the North of England over the next 25 years as well as what opportunities there may be to overcome these constraints. The particular focus of this work has been on those transport constraints that affect the economy of the North, both now and in the future and how overcoming these constraints can affect both the rate of growth of the North's economy and where in the North that growth occurs.

The Current and Future Economic Performance of the North

However measured, the North's economy is underperforming. This is apparent when the North is compared with international comparators and when the North's actual economic performance is compared with its productive capacity – that is its human capital (i.e. skills and experience) as well as its productive resources.

The Chancellor has set out the goal of creating a "Northern Powerhouse" – bringing together the major northern cities to create a single functional economic area, which will result in an economy both bigger and stronger than the sum of its individual parts. This goal is shared across the political spectrum, as is a recognition that it is cities that will lead the economic growth of the North.

Because the benefits of agglomeration overcome the costs associated with concentrating population and jobs, jobs in cities are more productive than jobs in rural areas. Our cities are demonstrably more efficient and richer than non-urban areas with the average output per worker 15% higher in city regions than non-urban areas. They have the potential to be more productive yet. In the North the city regions of the five Core Cities of Leeds, Liverpool, Manchester, Newcastle and Sheffield account for 60% of the North's Gross Value Added (GVA).

Nationally 73% of jobs in Knowledge Intensive Business Services (KIBS) are in cities. Accounting for one in every two jobs created between 2003 and 2008, it is expected that these sectors will continue to grow. These jobs are increasingly located in clusters - of the KIBS jobs based in cities, 40% are located in tightly defined city centres. These clusters benefit from being located near to each other by sharing inputs and infrastructure, pooling labour resources, and exchanging ideas. Supporting and facilitating growth in these sectors creates a challenge for the transport system.

The future of the North's economy, its cities and in particular their centres are strongly coupled. And what city economies and in particular their city centres need is good connectivity that allows firms to attract labour and gives employees access to job opportunities, that enables business to business interactions and that gives firms access to their suppliers and markets, both domestically and internationally.

It would be wrong though to focus singularly on the transport connectivity needs of city centres. Each of the northern Core Cities has sectoral specialisms outside the service sector and particularly in manufacturing. This is evident when looking at their Strategic Economic Plans. While their city centres are the largest single location for planned job growth, in aggregate each SEP is planning for greater growth elsewhere in their city regions. The connectivity needs of these areas are similar to those of city centres – access to labour, business to business links and access to markets – but the ways of achieving these may well have a different focus.

Creating and exploiting clusters will enhance the performance of city regions and provide them with a competitive advantage in those sectors. Providing connectivity that supports and facilitates the growth of these clusters will allow the North to grow to its full potential, although improving connectivity alone is not a sufficient condition to achieve this. Amongst other things, there needs to be provision of appropriate education and training, housing and sites and premises. Enhancing transport connectivity is just one factor that will deliver the Northern Powerhouse.

Transport Supports and Delivers Growth

Transport investments can, and generally do, affect the economy. They secure connectivity between different parts of the country as well as to the rest of the world: they link people to jobs; allow products to be delivered to market; underpin supply chains and logistics; and support domestic and international trade. In doing so, transport networks affect the location and pattern of economic activity and, by extension, support growth at a local, regional and national level.

Understanding the links between the availability of good transport infrastructure and services, and the performance of the wider economy has been the subject of numerous studies over several decades. What this work tells us is that transport connectivity supports economic growth through:

- Improved labour market efficiency, enabling firms to access a larger labour supply, and wider employment opportunities for workers and those seeking work;
- Improved business efficiency, notably by travel time savings, improving journey time reliability and travel quality;
- Stimulating business investment and innovation by supporting economies of scale and new ways of working;
- Agglomeration economies which bring firms closer (in space or time) to other firms or workers in the same sector;
- Increasing competition by opening access to new markets, principally by integration of world markets;
- Attracting globally mobile activity to the UK, by providing an attractive business environment and good quality of life; and
- Increasing domestic and international trade by reducing trading costs.

To help identify the transport constraints facing the North as well as the potential opportunities, it is useful to focus on the three markets for travel. These are:

- Journeys between city regions
- Journeys within city regions
- Journeys to/from international gateways

We use this definition to structure our report. However, while this categorisation is a useful one for looking at elements of the North's road and public transport networks, actual trip making does not conform to this neat classification. It is also necessary to consider the North's networks in the round. Furthermore, whilst this report makes general observations about constraints and opportunities in the North, the most effective prescription will vary according to the specific context of each city region.

HS2 and the North

HS2 Ltd has identified that:

- Investment in HS2 will create significant opportunities for the future economy
- HS2 can deliver improved economic performance
- In a modern economy the improvements in economic performance delivered by HS2 will occur in a number of ways
- HS2 also creates opportunities to alter the distribution of economic activity
- There is no 'one-size-fits-all' approach to maximising the benefits of HS2
- HS2 stations bring major opportunities for regeneration and development

For the North, the Y-shaped HS2 network that will be completed by 2032/33 will:

- By reducing journey times and providing additional passenger capacity, transform the connectivity of cities in the North to London with its World City functions in sectors such as finance, legal and advertising, as well as its role as the nation's capital
- Similarly, transform the connectivity of northern cities to Birmingham and from Yorkshire and the North East to the East Midlands
- Enhance connectivity within the North, for example between the Leeds and Sheffield city regions
- Via the interchange at Old Oak Common enhance the connectivity of the North to Heathrow Airport and the international connectivity that it offers
- Via Birmingham Interchange, offer enhanced connectivity from the North to Birmingham Airport
- Via Manchester Airport station, enhance the connectivity of Manchester Airport, particularly from the south

Extending Markets: Travel Between City Regions

The importance of transport connectivity to London, with its World City functions is recognised across the North. Similarly, there is a recognition that city-focussed growth across the North will lead to growth in the demand for travel between the city regions of the North and between the North and city regions elsewhere in the country. This is the case both for business travel and, by extending journey to work markets, for commuting trips.

With regard to the latter, it has been found that commuting between the Manchester and Leeds City Regions is about 40% lower than expected given the characteristics of the two cities and the physical distance between them. High overall commuting costs (as measured by generalised journey time) have been identified as the main cause of this lower level of commuting.

For the North's city regions to exploit their comparative advantages and reach their full potential, the conclusion is that there is a requirement for the demand for business to business and commuting travel between the city regions of the North to grow.

There are also increasingly important visitor economies in the northern cities, and the leisure market in the North is growing. A growing visitor economy creates new demands for transport connectivity, including at the weekends and in the evenings.

It is this combination of enhanced business to business interaction, expanded and overlapping labour markets and greater cultural and social exchange that will underpin the Northern Powerhouse described by the Chancellor in his June 2014 speech.

National Rail Network

Like rail demand in the rest of the country and despite the recent recession, longer distance rail passenger numbers have been growing in the North. This is despite rail journeys between the North's city regions:

- Being slow when compared with the car alternative, with a low frequency service and increasingly inadequate capacity for current demand
- Delivering poor reliability through service performance relative to the timetable

Trip making by rail between the northern city regions is forecast to grow, but for the North's rail network to maximise its contribution to the North's economic growth it is clear that connectivity will need to be enhanced beyond the currently committed schemes. This means faster journeys, more frequent services and greater on-train capacity.

Already the North's rail network is experiencing substantial investment. The Northern Hub programme will create new rail connectivity and will allow more trains to run to and through central Manchester – previously identified as the most significant rail bottleneck in the North of England. Electrification in the North West and across the Pennines will allow for increased capacity and faster journeys. However, the rate of growth that has been experienced and is forecast suggests that further enhancements will be required if rail is to make its full contribution to northern economic growth.

Strategic Road Network

The North's Strategic Road Network is congested – demand exceeds supply. The M1 approaching Sheffield from the south, the M6 approaching the Manchester and Liverpool city regions from the south, the M62 between Leeds and Warrington and sections of the M60 around Manchester all experience amongst the highest levels of delay experienced on the national network. Congestion is most notable around the city regions where the Strategic Road Network has the twin functions of providing for longer distance travel for people and goods, while being an integral part of local commuter networks. Of course, these impacts are not unique to the North. However, what is particular to the North is the limited resilience of the Strategic Road Network to disruption, notably for trans-Pennine movements.

Even when the Strategic Road Network is not congested, journey times between some city pairs are very long relative to the distance between them. Despite a distance of just 42 miles, the journey between Manchester and Sheffield takes well over an hour in uncongested conditions, representing an average journey speed of less than 35 miles per hour.

Through the period of the Great Recession, there has been little change in overall traffic volumes on the national motorway network (although there has been a noticeable fall in heavy goods vehicle traffic). However, with a recovering economy traffic growth is forecast to resume. The Highways Agency is investing heavily in Managed Motorways across the North, but in the face of traffic growth the extra capacity these provide and the associated journey

reliability improvements are anticipated to be exhausted perhaps as soon as 10 to 15 years from now.

The Highways Agency is also investing to address a number of gaps in the Strategic Road Network such as the A556 between the M6 and M56 in Cheshire and the A1 in North Yorkshire. However, a number of such gaps remain, in particular the Sheffield – Manchester corridor and the A1 north of Newcastle. Similarly, work is on-going to address a number of network pinch points, but others will remain.

Opportunities

Opportunities to mitigate these impacts on the Strategic Road Network are limited. There is no apparent appetite for the construction of new motorways. More extensive application of Managed Motorways would give some relief, but this will not provide any solution for those sections of the network that have already been subject to Managed Motorway treatment. Road user charging is currently not politically acceptable. While in the long term, new technology (eg vehicle platooning) may offer opportunities to get more from the existing network, there is at present no prospect for the application of such solutions to the Strategic Road Network. For the foreseeable future congestion and its economic consequences will continue to worsen.

Enhancing rail travel between the North's city regions, between the North and London and between the North and other city regions across the country will support the North's city regions to exploit their comparative advantages and so secure economic growth. It will do this by:

- Facilitating greater business to business interaction;
- Extending labour markets;
- Supporting cities' retail, leisure and visitor economies; and
- Providing an alternative to what will be a more congested Strategic Road Network

Even with committed enhancements there will, however, remain a further need to enhance rail connectivity in the North if its full economic potential is to be met. In particular:

- There are further benefits to be had from enhancing east-west connectivity across the Pennines to improve the links between Liverpool, Manchester, Sheffield and Leeds
- As will there be benefits from enhancing connectivity between Leeds/York and Newcastle, which in conjunction with trans-Pennine enhancements will improve connectivity between the North West and North East

Journeys tend not to be just from city centre to city centre. Onward connectivity is important and this is provided by the local Journey to Work networks in each city region. Improvements to the connectivity of these networks would strengthen the benefits that HS2 will bring and the benefits that further enhancements to inter-city connectivity in the North would deliver.

Improving the Journey to Work

Deepening labour markets - that is extending city's journey to work catchments - will support economic growth. This applies not just to the KIBS that have experienced strong growth and are forecast to grow in the future, it applies to other sectors too.

Within the North's Core Cities city regions transport networks are focussed on their city centres. Each city centre is a hub of its city region's road and bus networks and this is particularly the case for rail and light rail/metro services.

As well as providing access to the jobs and services located in and around the centres of the Core Cities, it is these local networks that will be used to access the HS2 city centre stations and provide public transport access to HS2's hub stations in the North.

Other town and cities within city regions also have their own radially focussed road and bus networks and while rail and light rail/metro tend to be concentrated on the centres of the Core Cities, these can also be important access modes to some of the secondary centres. On top of this, out-of-town centre retail and employment locations are important trip generators in their own right.

City regions are characterised by a complex and overlaying pattern of trip movements. To focus simply on radial trips to the centres of the core cities would mean that key transport constraints that affect city regions' economic future are not fully considered.

Looking at travel within the North's city regions:

- Private car is the most utilised travel mode
- Bus is the most utilised public transport mode catering for twice as many trips as rail and light rail/metro combined. However, the average bus trips is just 4 miles
- Rail and metro/light rail caters for about 6% of all trips in the major conurbations, but these trips are longer than trips by bus or car so rail's share of total travel is much higher at around 12%
- Public transport's share of trips into city centres is much higher than conurbation-wide data might suggest
- Rail mode share is particularly high for longer distance journeys to work into city centres

Road Traffic

In the fifteen years between 1993 and 2008 traffic in all of the North's city regions grew. This growth in traffic was due to a combination of more trips being made by car and longer average trip length. Since 2008, however, total traffic volumes have declined. This is likely to be due to a combination of effects: the economic downturn, a period of high fuel prices and changes to the car insurance market which have increased the cost of insurance to newly qualified drivers. However, this said, growing city populations along with economic growth suggests that there will be traffic growth in the future where and when networks have capacity to accommodate this.

Traffic conditions vary by time of day and by location across the northern conurbations. Each of the five city regions experience traffic congestion, with the view being that at peak times parts of the networks, notably those focussed on the centres of the Core Cities are operating at capacity. This provides a material constraint on growth in trip making by car to these city centres.

Congestion is not limited to the radial routes focussed on the centres of the Core Cities. Radial networks focussed on other towns and cities within the wider city regions experience congestion. Orbital networks experience congestion, notably at the intersection with radials and also at junctions with the Strategic Road Network. Each of the Core City conurbations has a number of pinch points that are congestion hot spots.

As well as congestion being a tangible constraint on peak hour traffic, car parking availability is a further constraint. The centres of the Core Cities have a limited parking supply and typically have policies that limit the development of further capacity.

Across the North's Core Cities, there is no appetite for significant radial road construction. This has been the position for many years. However, each of the Core City city regions has a roads programme that is focussed on:

- Enhancing orbital capacity
- Addressing particular pinch points – that is locations where there are significant capacity discontinuities that lead to congestion
- Enhancing access to sites that are identified in policy documents for regeneration or redevelopment.

As set out in the Strategic Economic Plans of the North's Core City city regions, some of these programmes are significant in terms of capital expenditure and their extent. Notwithstanding the city regions' programmes, the expectation is that demand will continue to grow and overall congestion will increase. While radial networks may be operating at capacity in the peaks, there remains capacity for growth in the shoulders to the peak, in the inter-peak periods and in the off-peak and at weekends.

Fiscal measures (i.e. road user charging) to manage and influence road traffic within the city regions are off the agenda for the foreseeable future. Opportunities available to city regions to influence future traffic conditions include:

- Greater use of Urban Traffic Management and Control (UTMC) – extending the scale of existing systems and introducing UTMC in secondary towns and cities
- Integration of local authority UTMC systems with the Highways Agency's management systems
- Creation of city region wide strategic networks that are managed at a Combined Authority level (akin to TfL's strategic road network). Such networks would be subject to a common maintenance policy, investment strategy and policy framework (on development, parking etc.), as well as centrally controlled day-to-day management.
- Car parking policy – both in terms of provision and charging. However, in many towns and cities the local authority influence on the supply and cost of parking is limited, with the majority of parking provision being in private sector control.

Bus

In 2012/13, 725 million journeys were made by bus in the North's five metropolitan areas. Bus patronage, however, has been in long-term decline. This trend pre-dates deregulation in 1986.

The reasons for this long-term decline are a combination of inter-related factors. These include socio-economic changes in the population, changes in the patterns of activity and the relative attractiveness of the bus offer vis-à-vis alternatives, particularly the private car.

Bus serves a vital social function catering for those with lower incomes, students and in particular those who do not have access to a car. However, amongst non-users bus is seen as a mode of last resort. According to DfT research, 66% of non-users (and 50% of bus users) agreed that they would only travel by bus if there was 'no other way of getting there'. Bus services are seen by non-users as slow, unpunctual, unreliable and of low quality.

It is widely accepted by stakeholders across the North that to support growth in bus demand there needs to be investment to support reduced bus journey times, improved reliability and punctuality, as well as enhancements to the quality of the bus offer. To be most effective,

investment by local authorities and bus operators needs to be planned and coordinated. This requires the public and private sectors to work together.

Overall, there appears to be a gap between the need and ambitions to grow bus use to support sustainable economic growth and local authorities' ability to implement change and secure the service enhancements that are required. For bus to play its full potential role in supporting economic growth, this public policy gap needs to be addressed.

Rail

Trip making by rail into the centres of the North's Core Cities has grown strongly in the last two decades. Rail demand is forecast to continue to grow.

There is currently crowding on many services, particularly those into the major centres at traditional peak times, but also elsewhere on the network and at non-peak times. Rolling stock utilisation is now at such a level that there are limited opportunities to handle on-going demand growth within the available fleet. Without additional capacity, rail services into city centres may act as a constraint to the accessibility of employment opportunities.

The quality of rolling stock is a very important issue for passengers. For example, a 2012 Passenger Focus study found that Northern Rail trains are felt to be at best uncomfortable but at worst dangerous, and passengers feel that the age and poor appearance of trains is symptomatic of a lack of respect for customers.

The rail network serving the North's city regions faces infrastructure constraints which limits both the number of additional trains that can be operated and the ability to operate new routes. Enhancements such as the Northern Hub and North West and Trans Pennine electrification schemes will increase network capacity and allow frequency enhancements on some routes. Further electrification proposals are currently being considered by the Electrification Task Force which is due to report to the Secretary of State by December 2014. These will offer further opportunities for capacity and quality enhancement.

Nonetheless, capacity constraints remain, notably on the approaches to the stations at the centres of the Core Cities including Liverpool Lime Street, Leeds and Sheffield and at the stations themselves, in terms of both number of platforms and the ability to cater for the longer trains that would be needed as part of a solution to enhance on-train capacity. Both station layouts and the capacity of their approaches limits the opportunities to run trains across cities. As well as offering potential operating efficiencies, cross-city rail services are a way of extending labour markets and connecting areas of population with the location of employment growth.

A further constraint to be considered is stations themselves. Many stations serving the North's city regions are unstaffed and while on-going programmes have improved many stations, others are still unattractive to users, especially travellers who may have concerns for their own personal safety. The integration of many stations into their local pedestrian and public transport networks is poor. Those stations that do have car parks find them well used and often at capacity with rail users parking in surrounding (and often unsuitable) streets. Availability of car parking will become a constraint on growth at some stations.

At the main destination stations there are, or will be with projected growth, pressure on the circulatory capacity for passengers, crowding at barrier lines, and congestion on stairs, escalators and on some platforms. These have the potential to be a serious constraint. Facilities at the main terminal stations in the Core City stations have been improved in recent

years (or are in the course of being improved), but there remains scope for further enhancement which will make them more attractive to users and so support growth.

Light Rail/Metro

Four of the North's five metropolitan areas have light rail and metro networks. These are:

- Merseyrail Electrics (while actually part of the national rail network, this has many of the characteristics of a metro network)
- Manchester Metrolink
- Sheffield Supertram
- Tyne & Wear Metro

There appears little prospect of any further light rail systems being built in the North. Even if proposals were brought forward, the planning process is such that it would be a minimum of ten years or so from inception to construction.

The most likely way that the role of metro/light rail in the North can be developed is through the extension and expansion of existing systems. The Manchester Metrolink system has been significantly extended in the last three years and further extensions are currently under construction and are planned. In South Yorkshire, funding has been awarded for a 'tram-train' extension of the Supertram network to Rotherham. This is a national trial for this technology that allows street-running trams to operate on the national rail network alongside other rail traffic.

Network Rail has identified the potential in those cities that have established light rail networks for conversion of rail routes to tram-train operation. This offers a potential solution to the twin goals of extending the coverage and reach of metro/light rail systems while relieving capacity at mainline terminal stations. However, only a limited number of routes will be suitable for such conversions. Nonetheless, tram-train opportunities have been identified in Manchester and in South Yorkshire, as have opportunities to extend the operation of the Tyne & Wear Metro onto the national rail network.

For the North's light rail/metro systems to meet their full potential, it is important that they are renewed and enhanced. The current operating concession for Sheffield Supertram expires in 2022 by which time its tram fleet will be 30 years old. It should be anticipated that the fleet will require replacement alongside a major programme of system renewal. Vehicles on the Tyne & Wear Metro and trains on the Merseyrail network are ageing, and there is only so much that can be achieved with refurbishment. At some stage, replacement will be needed. Options are being developed for replacement of the current Merseyrail fleet.

Access to International Opportunities

Direct connectivity from the North's airports offers the potential for quicker and more convenient door-to-door journeys for both business and leisure passengers. Similarly, direct connectivity from the North's ports offers the potential for quicker and overall lower cost movement of goods. There are clear economic benefits to be derived from expanding the scope of international markets that can be accessed from the North, both for exports and for inward investment and tourism.

The North's ports and airports are also significant employers in their own right with associated indirect and induced impacts on the economy.

Airports

Each of the airports in the North serves a catchment greater than the immediate city regions within which they sit. Manchester Airport's network of scheduled destinations and charter destinations served uniquely in the North means that it attracts passengers from across the entire North of England. It is by far the largest airport in the North with a throughput larger than that of all the other northern airports combined. As well as serving an extensive network of European destinations, Manchester Airport offers intercontinental connectivity. Manchester's comparatively extensive network of scheduled routes means that it is the most important business-focussed airport in the North. It is the only airport in the North connected to the national rail network and directly to the motorway network.

Each of the other airports in the North draw their demand from a wide area, in no small part because of the route networks offered by the low cost carriers and their competition on price, which extends airport catchment. Because its catchment is relatively distant from the other airports in the North, Newcastle Airport serves a particular local function for the population of the North East and as well as scheduled flights to European destinations, it offers intercontinental connectivity via Dubai.

After experiencing a downturn in throughput during the recession, passenger numbers at northern airports are currently growing strongly.

Airports in the North face a number of constraints which will influence their future development trajectory. Noting that bringing forward airside and terminal development is largely a commercial matter for airport owners, of particular relevance to this report are those that relate to surface access. These include:

- Manchester Airport, where surface access has been identified as the most significant single constraint on its future development. Central to realising the airport's masterplan is growing rail mode share. While served directly by the national rail network, rail connectivity is seen as a restricting factor in terms of a limited range of direct connectivity, the hours of rail's operation not aligning with the daily pattern of airport passenger and employee demand, train service unreliability and airport services being affected by on-train congestion elsewhere on the network.
- Leeds Bradford which is seen as having particular road access problems. These are currently subject to a Government-sponsored study to develop a way forward.

The Strategic Economic Plans for Liverpool and the Tees Valley includes proposals to enhance road access to their respective airports, partly to facilitate airport growth and partly to support airport-associated development. The Finningley and Rossington Regeneration Route Scheme (FARRRS) road scheme, which is under construction, will improve road access to Robin Hood Doncaster Sheffield Airport. Within their respective SEPs there are longer term aspirations to enhance public transport access to each of these airports.

Newcastle Airport has recently benefitted from junction improvements on the A1, which have addressed some of its most immediate road access problems. However, given that much of the airport's market is to the south, congestion on the A1 Newcastle Gateshead Western Bypass is seen as having a particular impact on the airport and its ease of access.

Ports

The three estuarial port complexes in the North around the Humber, the Tees and the Mersey serve national roles. Measured by tonnes lifted in 2013 Grimsby and Immingham on the

Humber is the largest port in the country, Tees and Hartlepool is ranked fourth, the Port of Liverpool sixth. These northern ports are national assets.

The ports on the Mersey, Humber (Grimsby/Immingham and Hull), Tees and Tyne are all rail connected. Rail is important for the onward movement of bulk goods, such as coal for the electricity supply industry. Rail is also an attractive mode for the onward carriage of Lo-Lo containers, given the economies that it can offer over road for longer distance movements. This is the sector where the largest growth is forecast. However, if the latest generation of containers are to be carried on standard wagons (the most economical way of hauling containers), then the rail network needs to be gauge-cleared to at least W10 standard.

Electrification in the North West and across the Pennines and elsewhere in the country is extending the scope of the gauge-cleared network, as is the implementation of Network Rail's Strategic Freight Network. It remains the case, however, that even with these enhancements the access from northern ports to a gauge-cleared network is limited, both in terms of the routes available and the paths that can be utilised. In particular, even with trans-Pennine electrification there will be no available gauge-cleared route across the Pennines, which limits the Port of Liverpool rail access to the distribution hubs in South and West Yorkshire and rail access from the Tees and Humber to the North West.

Furthermore, immediate access routes to the ports are not electrified so container trains from these ports either have to use diesel traction (which is higher cost and is slower, with a greater call on network capacity) or change traction, which also incurs additional time and money costs.

Road access is and will remain important for ports. Almost all Ro-Ro traffic uses road haulage to get to and from the port gate. Road haulage is also important for Lo-Lo and some bulk goods where either the length of haul and/or weight of goods do not make rail an attractive option. A number of ports in the North have road access problems which cause congestion on the local road network, traffic noise and contribute to poor air quality. Of note is the access from the A5036/Switch Island to the Port of Liverpool and the vehicular access to the Port of Hull, which involves goods vehicles travelling through the centre of the city.

Cross Cutting Themes

Almost all journeys using the Strategic Road Network use the local road network at the origin and destination ends of the journey and so are affected by the level of service on these roads. The North's Strategic Road Network forms an integral part of city regions' commuter networks. Similarly, many longer distance rail trips use local road and public transport networks at one or both ends of the journey.

As well as providing links between the centres of the North's Core Cities, the North's longer distance rail services are an integral part of each city region's public transport network. Rail services provide access to Manchester Airport. The North's classic rail network is largely mixed-use with freight and passenger services operating over the same tracks.

Roads

There is opportunity through the integration of Highways Agency and local systems to coordinate day-to-day management of local and strategic networks.

In the stakeholder engagement undertaken to support this work, there was a warm welcome for the Highways Agency's move to a longer term planning framework and in particular, the development of a Road Investment Strategy. What stakeholders did observe though was that:

- To be most effective any medium term programme needs to be set in the context of a longer term strategy, as is promised for the Roads Investment Strategy
- They would like to see the Highway Agency's medium term programme and, in the future, longer term strategy to be more reflective and more supportive of locally-derived plans and programmes

Rail

Working collaboratively as Rail North, local authorities across the North have set out a Long Term Rail Strategy which identifies the conditional outputs for the classic network that Rail North considers need to be met if rail is to make the fullest possible contribution to supporting the North realise its future economic potential. Rail North has set an ambitious goal of over a twenty year period doubling rail's mode share in the North. Through the One North initiative the five northern Core City city regions along with Hull have set in motion thinking about how the rail network should be developed over the next two decades, including beyond the bounds of the established network.

The next step must be to integrate the thinking from Rail North and One North with the national rail strategic planning process so that within the context of a longer term plan the investment programmes for Control Period 6 (2019-24) and beyond takes forward the implementation of the network enhancements that the North needs.

Planning

Each of the five northern Core City city regions now has a Combined Authority and these provide an institutional framework for local authorities within a city region to work together and with their Local Enterprise Partnership.

While each Core City city region has produced a Strategic Economic Plan (SEP), it is not the case that they have been produced with a shared set of planning assumptions or a common planning horizon. In part this is because SEPs are intended to have a deliberately competitive element, both for the associated Regional Growth Funding and for the rewards (jobs, economic growth, etc.) that come from their plan. Also, by their nature, the SEPs have a short to medium term perspective. Because of this, however, it is not clear that complementarity between the programmes of the respective SEPs is being exploited to the full.

As this report shows, the transport networks across the North cannot be considered in isolation and so neither can the strategies for their management, maintenance and enhancement. In addition, there is a need to take a longer term view – say 20 to 30 years. Through initiatives such as Rail North and One North, northern authorities have recognised the benefits of collaborative working across city regions looking over longer term time horizons. There are opportunities to extend the scope and scale of such collaboration to ensure that each city region is pursuing plans and programmes that are complementary, while at the same time making the most from the comparative advantages of the individual city regions.

Collaborative challenges do remain, however: once strategies have been agreed, the next task is to agree a prioritised programme of implementation.

Sustainability

The focus of this report has been on how the transport can support the economic growth of the North and the constraints and opportunities that are face. Cross-cutting all of the connectivity needs that have been considered is the need to consider environmental sustainability. Already the North's town and city centres face air quality problems and transport emissions are the most significant contributor to these. There is an obligation for the transport sector to contribute to the nation's obligations to reduce carbon emissions. Returning to the economic perspective, the long term prospects for North's economy are not well served by losing sight of these issues.

Acknowledgement

This report has been prepared for HS2 Ltd by Steer Davies Gleave. We would like to note our appreciation of the advice and support received from our client, HS2 Ltd as well as those stakeholders from the North's Core City city regions who engaged with us during the production of this report. This said, any errors or omissions in this report are our responsibility and ours alone.

1 Economic Performance of the North

"We need a Northern Powerhouse. Not one city, but a collection of northern cities – sufficiently close to each other that combined they can take on the world" (George Osborne, 2014)

Summary

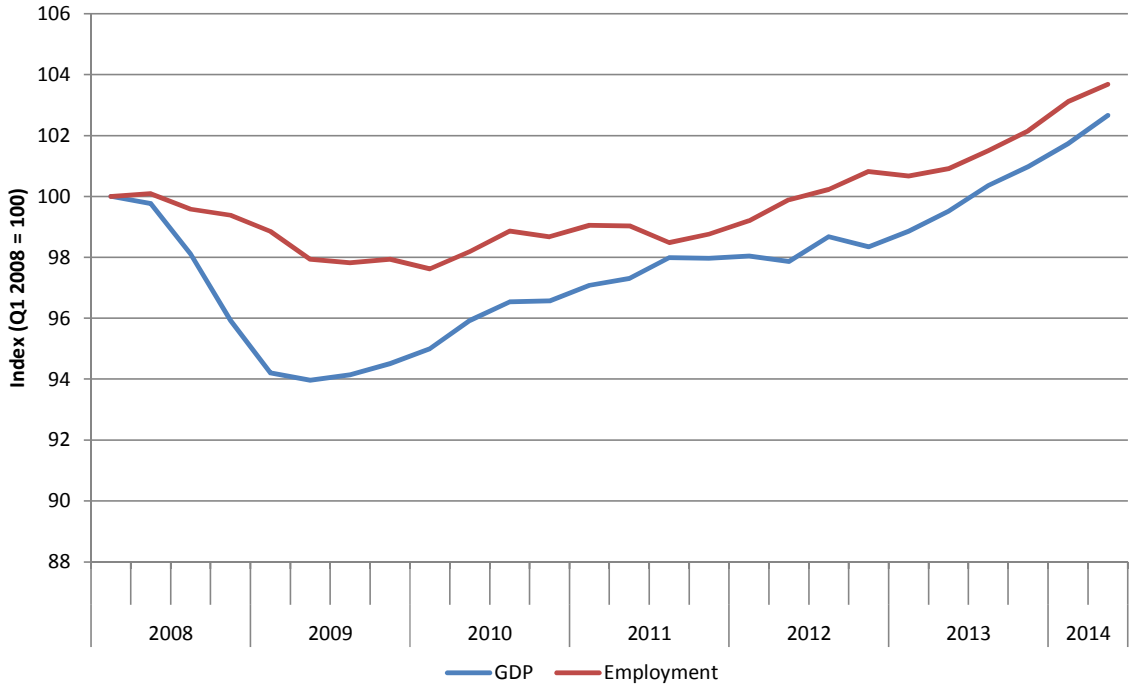
- Between 2008 and 2011 the UK economy experienced one of the worst recessions in modern history
- While GDP has now recovered from the falls in the recession, GDP per capita has recovered only part of that fall and this suggests that the UK economy is currently operating below its productive capacity
- Given the extraordinary interventions required to sustain our financial institutions and reduce the budget surplus, the range of direct levers available to stimulate growth and hence close the output gap is limited
- Within this context the Coalition Government is looking at supply-side measures which enhance the long-term productive capacity of the economy as central tenets of its strategy for growth
- Measures are being sought to:
  - Ensure inputs are being deployed to meet their current potential; and
  - Further improve their productive capability
- In addition to considering the type of intervention that might stimulate growth in the UK economy, a great deal of consideration has recently been given to where that support might best be targeted
- A broad range of documents advocating policy prescriptions that seek to rebalance the UK economy have been recently published and there are similarities between the recommendations being put forward parties and organisations across the political and economic spectrum
- Within these reports there is a recognition of the role that enhancing transport connectivity has to play on both the scale and distribution of future economic activity, and a recognition that transport connectivity enhancements will require actions at a local, regional and national level by the public and private sectors
- The three northern regions currently support 6.8 million jobs, with a total economic output of £266 billion in 2012

- However, there are underutilised resources in the North, as shown in the figures for unemployment, 16-18 year olds not in employment, education or training, and average qualification levels
- Cities are demonstrably more efficient and richer than non-urban regions with the average output per worker 15% higher in city regions than non-urban areas. There remains, however, significant variation in the performance of our cities relative to one another, and to their global competitors
- Creating and exploiting clusters will enhance the performance of city regions, although improving connectivity is not a sufficient condition to achieve this and a supportive business environment is needed if the desired structural changes are to occur

The UK Economy

1.1 Between 2008 and 2011 the UK economy experienced one of the worst recessions in modern history, with significant reduction in economic output accompanied by job losses in key industrial and service sectors and a reduction in public sector employment. At the same time there has been a shift towards part-time employment which has helped to limit the quantity of unemployment compared to that observed in previous downturns.

Figure 1.1: Index of UK GDP and Total Employment since 2008



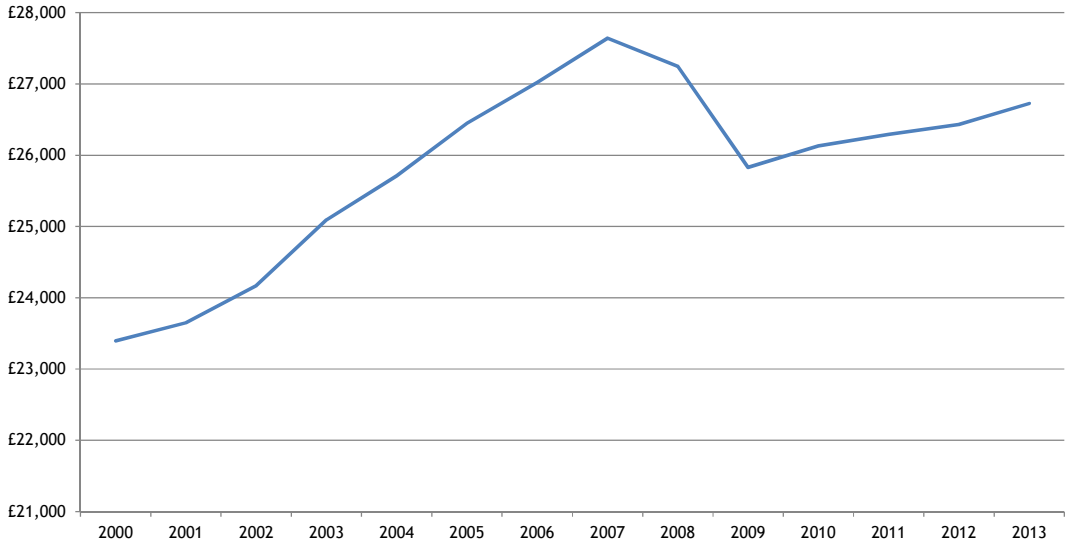
Data source: ONS, Integrated FR (ONS identifier: MGRZ), (Labour Market Statistics : 17th September 2014) and ONS Gross domestic product by category of expenditure: chained volume measures (ONS identifier: ABMI) (Quarterly National Accounts: 30th September 2014

1.2 While headline measures of economic output have recently recovered to pre-recession levels (see Figure 1.1), output is now spread across a significantly larger population. Between 2008

and 2013 the population of the UK has risen by more than 2.3 million to 64.1 million, and the working age population has risen from 40 million to 40.9m[1].

1.3 In practice this means that while GDP has now recovered from the falls in the recession, as shown by Figure 1.2, GDP per capita has recovered only part of that fall and remains 7% below its pre-recession peak.

Figure 1.2: GDP per capita 2000 to 2013 (2013 prices)



Data source: ONS Gross domestic product (Average) per head (IHXT) (30th September 2014) (United Kingdom Economic Accounts) and HM Treasury GDP deflators at market prices, and money GDP (30th June 2014) (Quarterly National Accounts)

1.4 Both of these observations suggest that the UK economy is currently operating below its productive capacity. Indeed, the Office for Budget Responsibility forecasts that the UK economy will remain 1.4% below its productive capacity during 2014[2]. In cumulative terms this means that the UK economy is currently more than 10% smaller than it would have been if the Great Recession had not occurred and previous trends had continued. Looking ahead, while the recovery is gathering pace, the UK's trend growth rate is now below that of its pre-recession levels[3].

1.5 Given the extraordinary interventions required to sustain our financial institutions, and the subsequent austerity measures implemented by the Coalition Government, the range of direct levers available to stimulate growth and hence close the output gap is limited. In particular, if the Coalition Government is to reduce the deficit at its intended rate, there is very little scope

[1] ONS Annual Mid-year Population Estimates (working age 16-64) 2014

[2] Chart 2.5 of Office for Budget Responsibility *Economic and Fiscal Outlook* (March 2014) and accompanying text

[3] In 2007 the long-term GDP trend growth rate was estimated by HM Treasury at 2.75% (see HMT, *Budget 2007*). The most recent estimate produced by the Office for Budget Responsibility estimates trend growth to be just 2.2% (OBR, *Economic and Fiscal Outlook 2014*)

to use further fiscal measures (increase government spending) or monetary instruments (reduce borrowing rates) to provide a stimulus to demand across the economy. Nevertheless, such measures tend only to offer a short-term boost and do little to deliver sustainable long-term growth.

1.6 Against this context the Coalition Government is, instead, looking at supply-side measures which enhance the long-term productive capacity of the economy as central tenets of its strategy for growth. These measures focus on the key inputs for generating economic output, for example, ensuring a labour force with the right mix of skills, securing funding for new enterprises, or widening access to high-speed broadband. Supply-side measures are being sought to:

- ensure inputs are being deployed to meet their current potential; and
- further improve their productive capability.

1.7 Enhancing transport connectivity is one supply-side intervention that can support economic growth and, as set out in the *National Infrastructure Plan* (2013), the Coalition Government has been investing significant sums in transport.

1.8 In support of this supply-side approach, the World Economic Forum (2013) recognises the role of infrastructure as one of twelve pillars of competitiveness and productivity in the global economy, and the OECD (2013) identifies improvement in public infrastructure, particularly transport, as one of three key structural reforms needed to promote UK economic growth[4].

1.9 In addition to considering the type of intervention that might stimulate growth in the UK economy, a great deal of consideration has recently been given to where that support might best be targeted. For example, as noted by Gardiner, Martin, Sunley and Tyler (2013)[5]:

> "A major economic recession inevitably provokes a search for causes and explanations, as well as a rethink of policy agendas and models. One of the key issues that surfaced in the wake of the financial crisis and ensuing recession was a political recognition that the UK's economy has become too spatially unbalanced."

1.10 It is within this political and economic context that a broad range of documents advocating policy prescriptions that seek to rebalance the UK economy have been recently published. For example, at the Prime Minister's request, Lord Heseltine's report *No Stone Unturned* (BIS, 2012) puts forward 89 recommendations regarding how the nation might more effectively create wealth to address what he saw as spatial and structural imbalance in the economy. He recognised the role of transport connectivity in supporting economic growth and said that:

[4] See World Economic Forum, *Global Competitiveness Report* (2013) and OECD, *Going for Growth Country Notes: United Kingdom* (2013)

[5] See Gardiner, Martin, Sunley and Tyler; *Spatially Unbalanced Growth in the British Economy* (2013) Journal of Economic Geography

> "Decisions on housing or transport, education or welfare support will have a far greater long term impact on our economic prospects than any form of direct support provided to business."[6]

1.11 The Deputy Prime Minister has lent considerable support to the Regional Growth Fund. Amongst other objectives, the fund is designed to "support particular areas and communities that are currently dependent upon the public sector for employment to transition to private sector-led growth and prosperity[7]". Investing in transport is one of the themes of the Regional Growth Fund.

1.12 A further set of policy recommendations has been put forward to the Labour Party by Lord Adonis, who advocates a range of measures linked to research and innovation, regional devolution, skills and access to funding[8].

> Infrastructure is a key element of the enabling environment for economic growth … Access to infrastructure such as energy, transport, and telecommunications greatly influences the productivity of private investment and an economy's competitiveness.[9]

1.13 Broadly similar recommendations are repeated by the London School of Economics, the Institute for Public Policy Research and the Smith Institute[10], amongst others.

1.14 While it cannot yet be described as a consensus, the similarity between recommendations put forward by parties and organisations at different ends of the political and economic spectrum is striking. There is a recognition of the role that enhancing transport connectivity has to play on both the scale and distribution of future economic activity. There is also recognition that connectivity enhancements need to target the full range of transport movements that are made – within cities, between cities and internationally as well as meeting the needs of Britain's rural communities. There is a recognition that transport connectivity enhancements will require actions at a local, regional and national level by the public and private sectors.

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[6] Para 25 of The Rt Hon the Lord Heseltine of Thenford CH, *No Stone Unturned in Pursuit of Growth* (Oct, 2012)

[7] Department for Business, Innovation and Skills, *Regional Growth Fund: Round 6 Leaflet* (2014)

[8] The Rt Hon. the Lord Adonis, *Mending the Fractured Economy: Final Report of the Adonis Review* (Jul, 2014)

[9] Page 21 of *Mending the Fractured Economy*

[10] See London School of Economics Growth Commission, *Investing for Prosperity: Skills, Infrastructure and Innovation* (2013); Institute for Public Policy Research, *New Priorities for British Economic Policy* (2013); and The Smith Institute, *Rebalancing the Economy: Prospects for the North* (2011)

1.15 The purpose of this report is not to provide another variation of the same themes. Its narrow remit is, instead, intended to set out contemporary thought on how transport investment can help stimulate, support and accelerate growth as part of a wider package of policy measures related to the supply-side of the UK economy. Within that context it will then explore the transport constraints and opportunities that the North currently faces and is anticipated to face in the future.

1.16 The geographic focus for the remainder of this report is the north of England as represented by the North West, North East and Yorkshire & Humber regions as illustrated in Figure 1.3.

1.17 This geographic definition captures the five Core Cities in the North (Leeds, Liverpool, Manchester, Newcastle, Sheffield) and their surrounding city regions, each of which is represented by a Combined Authority.

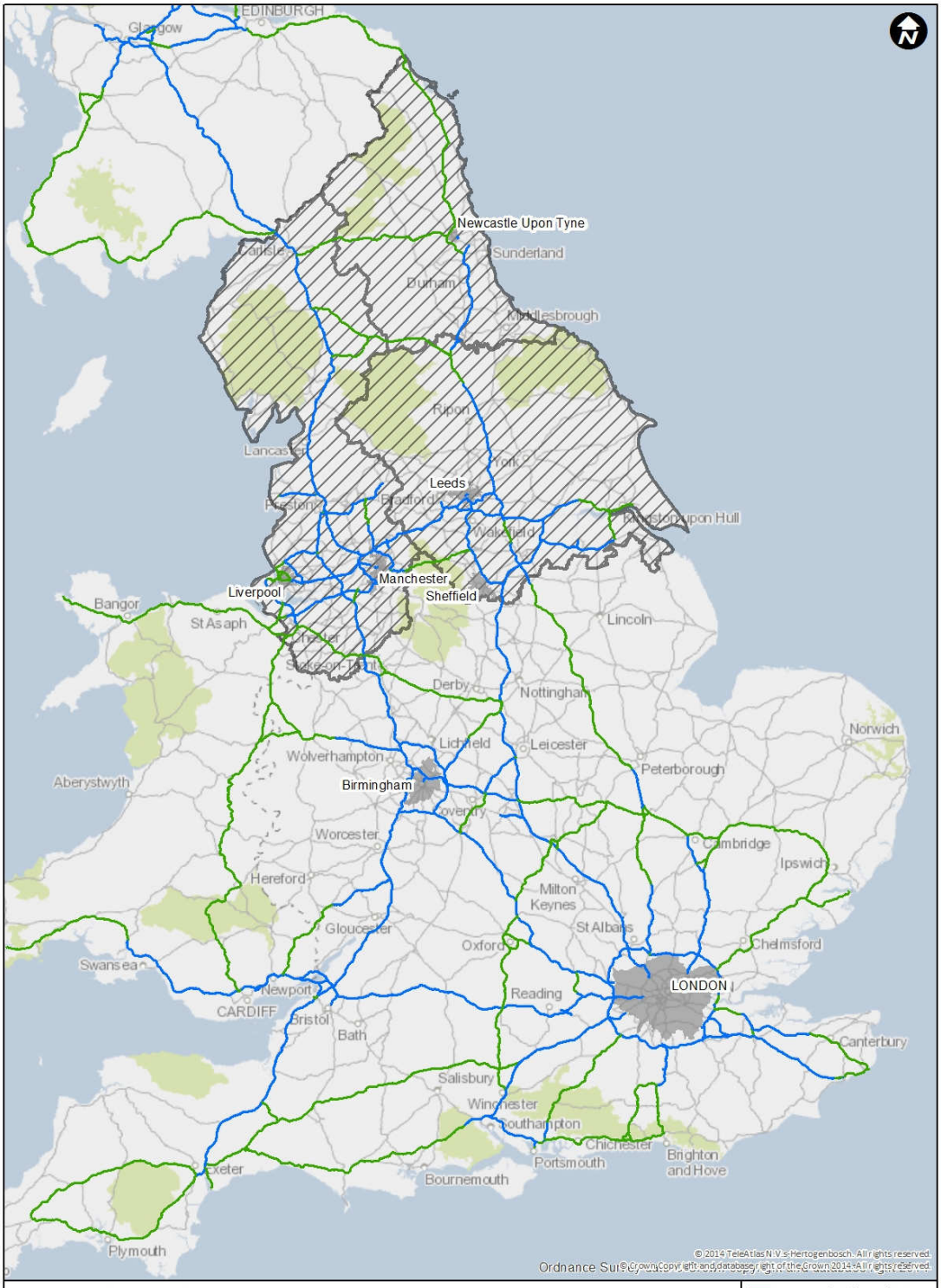
Persistent Regional Disparities

1.18 The Government objective of spatial rebalancing of the UK economy is not a new one. As identified by the Smith Institute in their report *Rebalancing the Economy: Prospects for the North* (2011), the origins of regional policy stem from the unemployment experienced between the First and Second World Wars, particularly in those regions with a traditional Victorian industrial base. At the same time London and the South East led the emergence of the new industries of the era, together accounting for the creation of 70% of all new manufacturing firms.

1.19 Rising public concern with this growing spatial imbalance led to the appointment of the Barlow Commission on the Distribution of the Industrial Population. In its January 1940 report, the Commission recommended the establishment of a central authority concerned with industrial location, whose remit would include "encouragement of a reasonable balance of industrial development, so far as possible, throughout the various divisions or regions of Great Britain."

1.20 Despite the objective of spatial rebalancing remaining relatively constant since 1945, and the substantial budgets dedicated by successive governments to reducing these differences, the degree of spatial imbalance in the UK economy is both real and has continued to widen.

Figure 1.3: Geographic focus of this report



North East, North West and Yorkshire and Humberside Regions

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1.21 It is less well known, however, that during the 1970s and much of the 1980s, London grew considerably more slowly (in output terms) than almost all of the rest of the UK, with only the North West region performing less well[11]. Figure 1.4 is taken from Gardiner, Martin, Sunley and Tyler (2013) and shows the year on year cumulative difference between a region's annual percentage growth of GVA and the corresponding rate for the British economy as a whole.

Figure 1.4: Cumulative regional GVA growth 1971 – 2010

Source: Gardiner, Martin, Sunley and Tyler; *Spatially Unbalanced Growth in the British Economy* (2013) Journal of Economic Geography

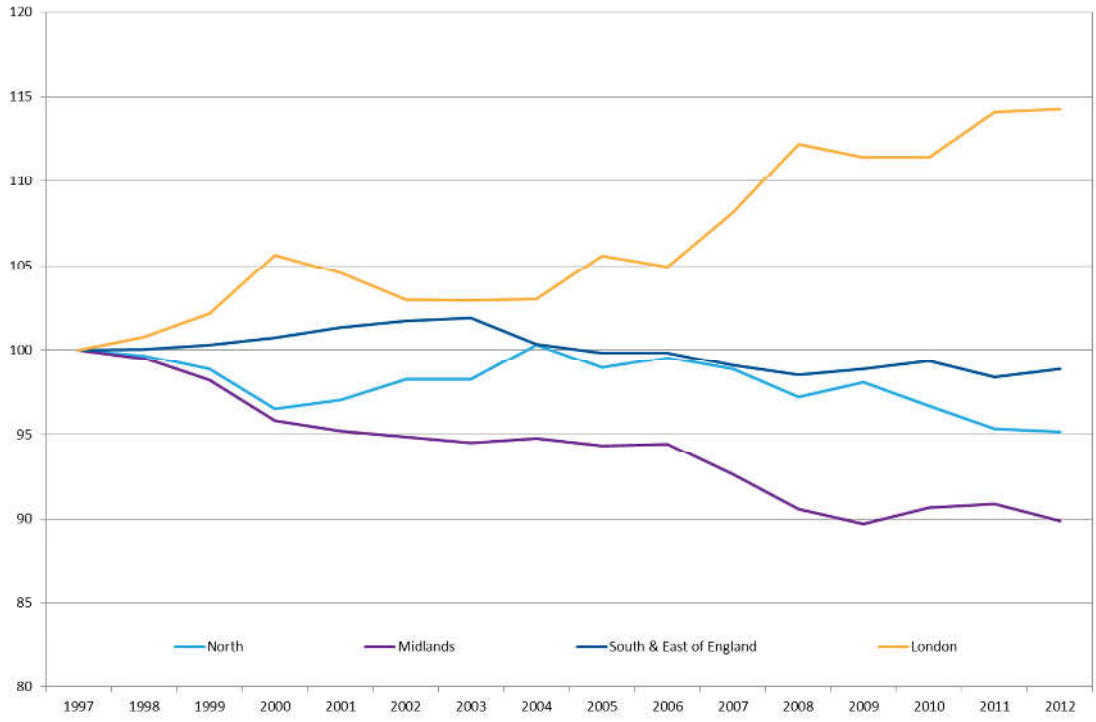
1.22 London's fortunes changed following the financial liberalisation and deregulation of the 1980s as it was able to exploit its comparative advantage in finance, banking, insurance and related services. As argued by Bridget Rosewell in her book *Reinventing London*, this was only possible because London had sufficient spare capacity to allow one million jobs to migrate from the suburbs to the city centre as economic pressures changed[12]. Regardless of the reasons behind London's recent success it is notable that with appropriate conditions regions can turn around their fortunes.

1.23 As indicated by Figure 1.5, within the current context it will be important to support the regions in the North to create the conditions most conducive to support and complement private sector growth, in line with the objectives of the Local Growth Fund.

[11] See Gardiner, Martin, Sunley and Tyler; *Spatially Unbalanced Growth in the British Economy* (2013) Journal of Economic Geography

[12] See Rosewell B, *Reinventing London* (2013)

Figure 1.5: Cumulative growth in workplace GVA (1997 constant prices, England=100)



Data Source: ONS workplace based regional GVA at current basic prices (2012, Table 3.1) and ONS GDP deflator (Quarterly National Accounts: 20 December 2013)

1.24 The shift towards knowledge intensive jobs and industry continues today, and each of our northern city regions includes one or more economic clusters of specialist economic activity. As set out by Graham (2007)[13] in his ground-breaking work on agglomeration, improved transport links should therefore allow these clusters to boost productivity through attracting the best labour, lower the cost of doing business and expand their final product markets both in the UK and abroad, and improve efficiency through removing duplication of activity in multiple locations or across a number of firms.

1.25 In doing so the north of England will have a strong platform from which it can exploit its own comparative advantages and seek to reinvent itself as a location for growth, just as London did during the 1980s.

1.26 Its size alone means London will always be an important factor in the economic prosperity of the whole of the UK. However, there is consensus that its success should not be at the expense of the rest of the country. By focusing on raising performance in every town and city, long term economic growth can be sustained while improving resilience to global shocks such as the 2008 credit crunch and subsequent recession.

[13] See Graham D (2007) *Agglomeration, Productivity and Transport Investment,* Journal of Transport Economics and Policy 41, 1–27

The Economy of the North

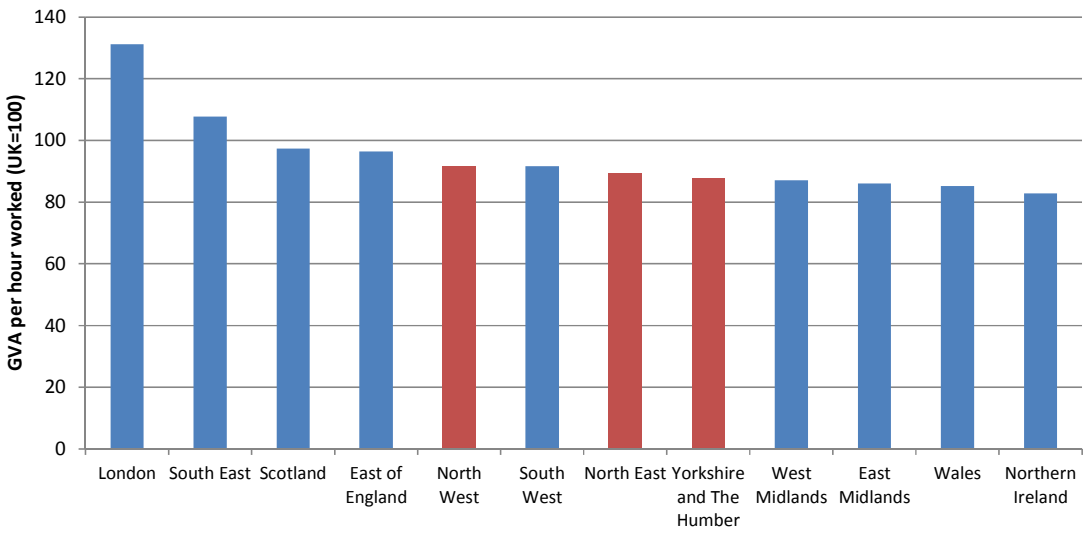
1.27 The previous section considered the historic performance of the economy in the north of England compared with other regions. While it did not seek to explain why the northern economy has underperformed, it highlighted a body of evidence that good transport networks are an essential component of any strategy to deliver local and regional economic growth.

1.28 The three northern regions (North West, North East and Yorkshire & the Humber) have a population of 15.1 million people, comprising over 23% of the total UK population. They have approximately the same population as Sweden and Denmark combined. The ONS expects the population of the North to increase by 6.5% from 2013 to 2030. Without any change to trip making habits the forecast increase in population will lead to the number of journeys made in the North increasing.

1.29 In addition to population growth, it is expected that with increasing mobility amongst older cohorts, plus larger numbers of young people attending university and living away from home, the demand for longer distance inter-regional trips will grow.

1.30 The three northern regions currently support 6.8 million jobs, with a total economic output of £266 billion in 2012. This represents 19.2% of the UK's entire GVA output and is greater than the output of Scotland, Wales and Northern Ireland combined. While the GVA contributed per hour worked is below the UK average (as shown in Figure 1.6), after removing London from the comparison it is notable that all three Northern regions perform close to the national average.

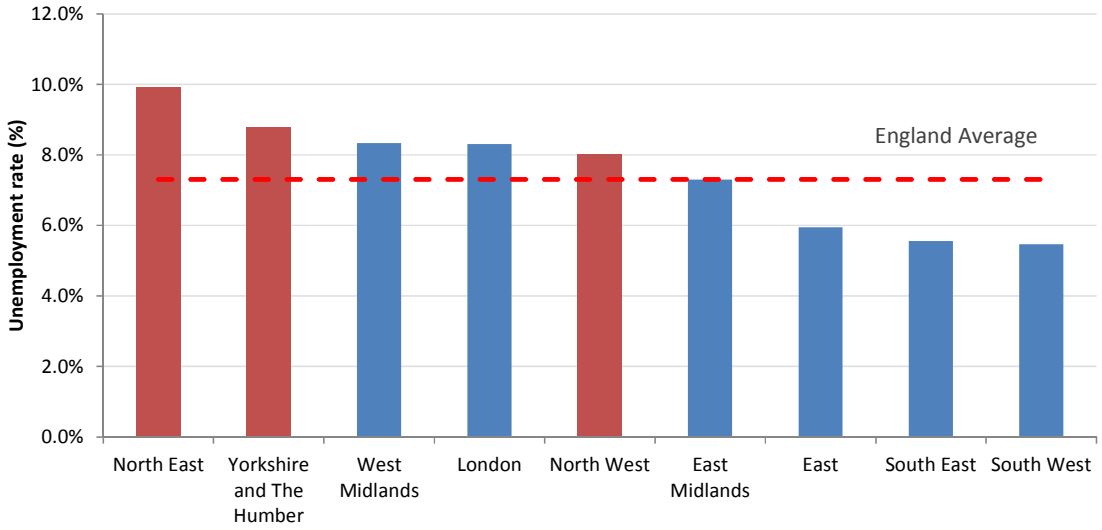
Figure 1.6: GVA per hour worked by UK region (2012, current prices)



Data Source: ONS Unsmoothed GVA per hour worked (11th March 2014) (Regional Economic Analysis)

1.31 There are also underutilised resources in the North. The level of spare capacity in the economy of the North can be seen in figures for unemployment and the number of young people not in education, employment and training, for example. Figure 1.7 shows each of the three northern regions have unemployment rates above the English average, with particularly high rates of unemployment in the North East and Yorkshire and Humber regions.

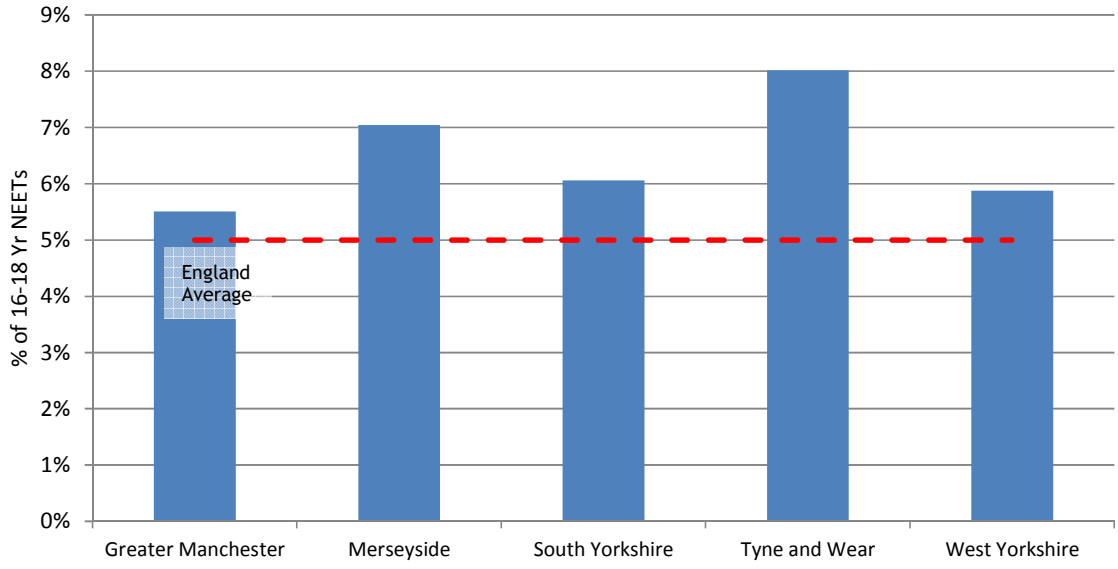
Figure 1.7: Unemployment rate in English regions (April 2013 – March 2014)



Data source: ONS Annual Population Survey (3rd October 2014)

1.32 As shown in Figure 1.8, the proportion of young people not in full time education, employment or training is, again, higher than the English average.

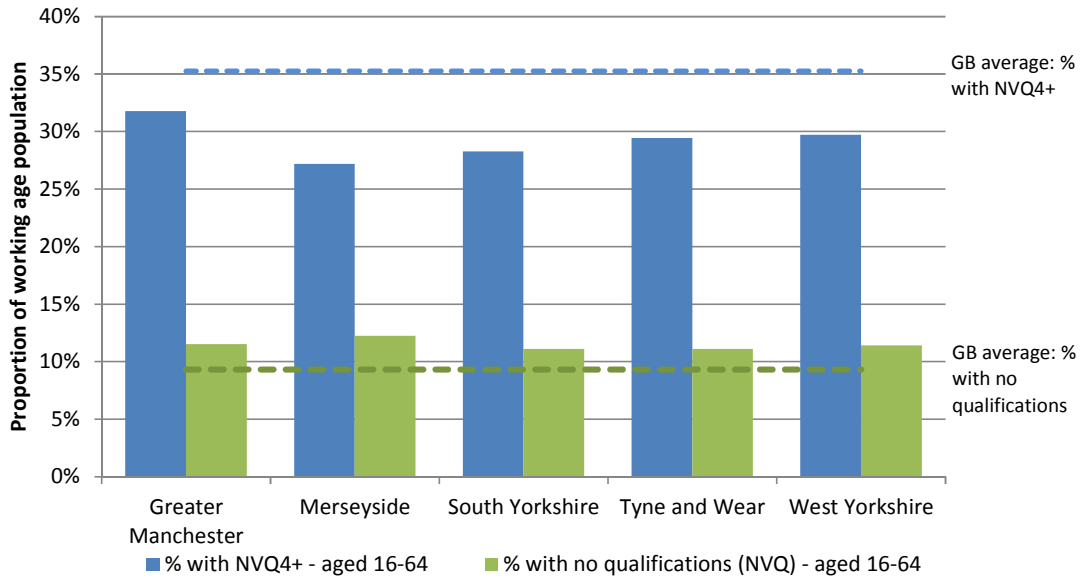
Figure 1.8: Proportion of 16-18 year olds not in employment, education or training (NEETs) (Nov 2013 – Jan 2014)



Data Source: Department for Education NCCIS management information requirement (30th December 2013). Merseyside includes Halton.

1.33 Finally, the average skills level of individuals living and working in the northern regions is lower than the average for Great Britain. Across all five northern city regions the proportion of working age people without any formal qualifications is marginally above the Great Britain average, while the proportion of people without the top level of qualification (NVQ level 4) is well below the GB average. This is shown in Figure 1.9.

Figure 1.9: Education level in the five northern city regions (2013)

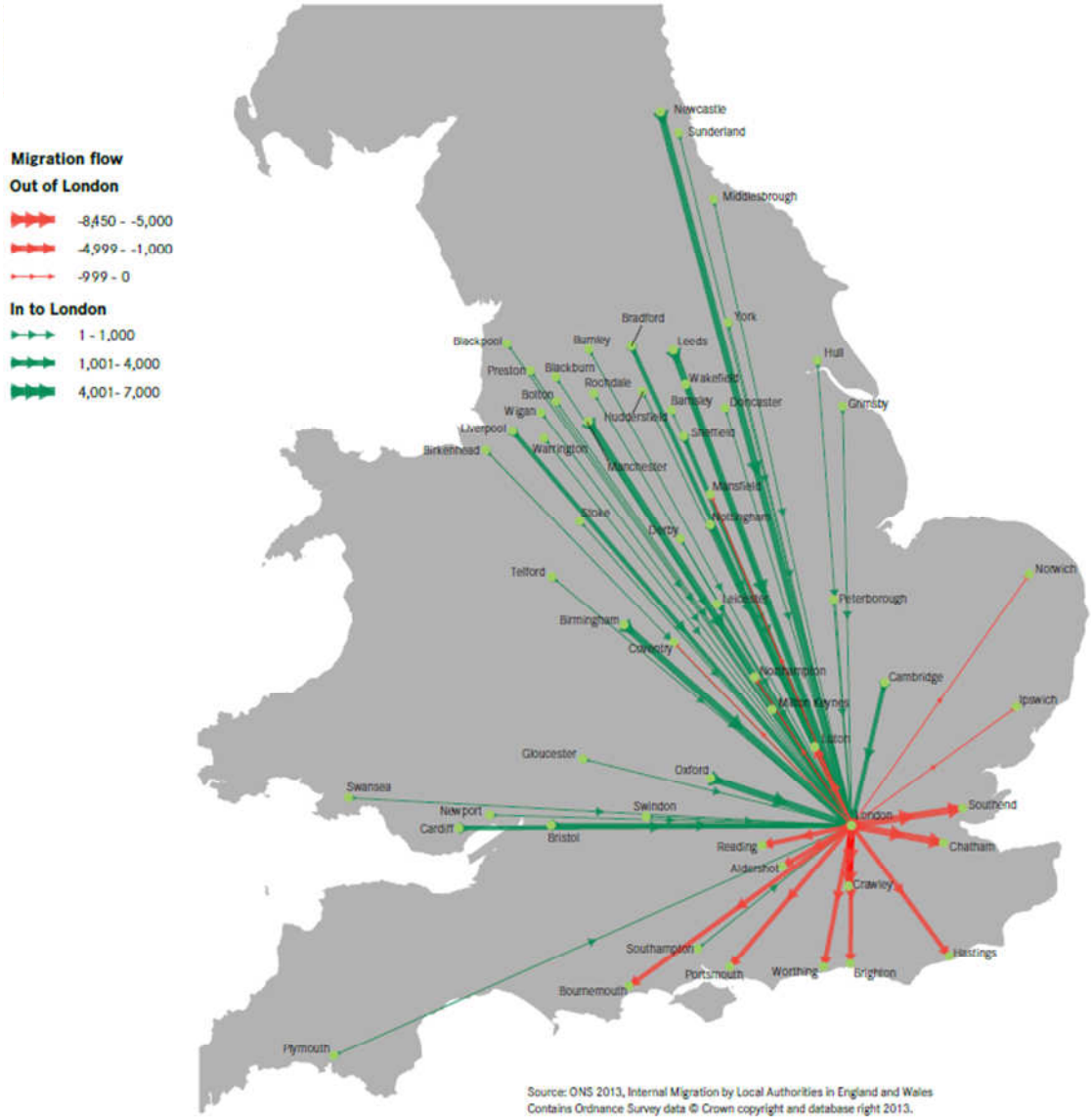


Data Source: NomisWeb, Annual Population Survey (9th September 2014). Merseyside includes Halton

1.34 The evidence above demonstrates that the northern regions contribute a significant proportion of total output and sustain more than a quarter of all jobs in England and Wales. While the northern regions have a proportion in public sector employment higher than the national average, this is likely to reflect the relative weakness of the private sector in the North compared to London and the South East, rather than the public sector being over-represented. At the same time Core Cities are expected to have above average number of public sector specialisms, since they provide services to wider city regions, including education, public administration and healthcare. Core Cities in the North are also home to national public sector functions serving the whole country, for example the Department of Health (Leeds), Department for Work and Pensions (Sheffield), Her Majesty's Revenue and Customs (Sunderland).

1.35 Other indicators suggest that there is considerable amount of spare capacity available in the North that could be brought into productive use. Qualification levels are below the national average although, as shown in Figure 1.10 this is likely to reflect net outward migration to London and the South East rather than the inherent capability of individuals from the northern regions. Furthermore, the number of individuals claiming job-seekers allowance or not in employment, education or training are persistently higher than the national average.

Figure 1.10: Net flow of people to London from other cities (2009-2012)



Source: Centre for Cities, *Cities Outlook 2014*

1.36 This suggests that for the North to realise its growth potential it needs to ensure that its human capital is subjected to the policy prescription set out at the start of the Chapter to:

- ensure inputs are being deployed to meet their current potential; and
- further improve their productive capability.

1.37 Transport can play a role in supporting these policy objectives, but a broader portfolio of supply-side measures such as those set out by Lords Heseltine and Adonis are likely to be required.

The Role of Cities

1.38 While the previous section offered a high-level overview of the state of the Northern economy, this section focuses on the impact that cities can have on the economic prosperity of a wider region. It draws heavily upon insights prepared by the Centre for Cities in their forthcoming study *Where are the Priority Linkages for Transport Investment to Maximise Economic Growth in the North* (2014) prepared for the Department for Transport. Further background and statistics on the role of cities in the northern (and national) economy can be drawn from the *Cities Outlook* 2014 produced by the Centre for Cities.

1.39 Cities are often described as the engine rooms for growth. They account for 54% of the UK population, 59% of jobs and 61% of all economic output[14], showing that they contribute to the economy disproportionately to their population. In the North the five city regions of Leeds, Liverpool, Manchester, Newcastle and Sheffield account for 60.4% of all northern GVA and 11.6% of UK GVA[15]. The need for these cities to grow and realise their full economic potential is widely accepted as an imperative for the North and the UK.

1.40 According to the Centre for Cities our cities are demonstrably more efficient and richer than non-urban regions with the average output per worker 15% higher in city regions than non-urban areas[16] . There remains, however, significant variation in the performance of our cities relative to one another, and to their global competitors.

1.41 Nationally 73% of jobs in Knowledge Intensive Business Services (KIBS) are in cities. These jobs accounted for 1 in every 2 jobs created between 2003 and 2008 and it is expected that the UK will continue to grow these sectors through de-industrialisation. Consequently, within these knowledge intensive sectors, there will be increased competition and the highest salaries.

1.42 These jobs are increasingly located in clusters and are benefitting from locating near each other through the process of agglomeration: sharing inputs and infrastructure, pooling labour resources, and exchanging ideas. Of the KIBS jobs based in cities, 40% are located in city centres. The process of agglomeration has led to the clustering of certain industries and specialist sectors.

1.43 As set out in their Strategic Economic Plans, many of the city regions in the North have identified a number of specialist sectors and industries to be targeted for growth within their area. For example, as indicated in Table 1.1 Sheffield (shown as South Yorkshire) is seeking growth in advanced manufacturing, engineering and healthcare technologies and low carbon industries, among others. It should be noted that Table 1.1 is not exhaustive and the sectors identified have been limited to three for each city region.

[14] Centre for Cities *Cities Outlook 2014*

[15] ONS; Workplace based GVA at current basic prices; 2012

[16] Centre for Cities *Cities Outlook 2014*

Table 1.1: Growth Sectors in Northern City Regions

City Region	Specialist sub sectors
Greater Manchester	• Life sciences • Healthcare • Freight and logistics
Merseyside	• Life Sciences • Advanced Manufacturing • Creative and Digital
South Yorkshire	• Advanced manufacturing • Engineering and healthcare technologies • Low carbon industries
Tyne and Wear	• New economy • Higher education • Healthcare and healthcare technologies
West Yorkshire	• Digital and creative industries • Advanced manufacturing • Financial and business services

Source: Local Enterprise Partnership Strategic Economic Plans (2014)

1.44 As set out in their 2013 report for HS2 Ltd, Rosewell and Venables[17] identify that a new high speed rail network would:

- Reduce times between city centres (and edge of cities);
- Increase capacity between cities;
- Shift mode share for existing trips; and
- Free up train paths on the existing network for commuter and freight trains.

1.45 Using economic historian Tim Leunig's observation that "transport matters when it connects up two places that are synergistic, or when it allows a confined place to grow" they point out that the full impacts of connecting places that are synergistic have received less attention in the academic literature and are not included in the formal appraisal of HS2.

1.46 They go on to build a framework which suggests that the principles of specialisation and trade, which more often than not are recorded and studied at a national level, equally apply to trade between regions of any given country, or between towns either within the same region or in different regions. In other words, more trade within a country would improve overall prosperity just as more trade between countries does. Within this framework connectivity allows each location to gain scale in a particular range of activities, thereby gaining a comparative (and absolute) advantage in what it does. Rosewell and Venables conclude that:

[17] See Rosewell and Venables (2013) *High Speed Rail, Transport Investment and Economic Impacts*, HS2 Ltd

> "The implications of this thinking are that better connectivity creates potential gains for connected places. Long run prosperity requires that each region has a strong tradable sector (or export base) and this in turn requires the presence of firms that are 'world class', competitive against international competition"

1.47 While city regions in the North should aspire to better economic performance in line with their considerable potential, we find the common comparison with the performance of London and the South East to be misleading. It is important to recognise that London is a special (if not unique) world city. Therefore policy-makers should consider cities in the North relative to their own potential and benchmark them against their counterparts abroad, rather than in comparison to London.

1.48 Creating and exploiting clusters will enhance the performance of city regions, although improving connectivity is not a sufficient condition to achieve this and a supportive business environment is needed if the desired structural changes are to occur. There are positive signs emerging from current city developments. Local authorities are showing energy for working together to foster growth, and there is increasing understanding that investing in distinctiveness is more effective than chasing the same mobile investments. One North - a grouping of local authorities across the northern regions - is evidence that there is considerable potential for authorities across the North to work together.

Constraints and Opportunities

1.49 Despite the size and duration of the recent economic downturn, in contrast with other recessions, the decline in economic activity between 2008 and 2011 has not been accompanied by a comparable and appreciable decline in passenger transport volumes. As set out in more detail in Chapter 3, the Strategic Road Network (SRN) has remained busy and congestion problems have not materially lessened. Rail passenger numbers actually continued to grow.

1.50 As the economy recovers further growth in rail passenger numbers and growth in traffic on the strategic road network is anticipated. Without investment beyond that which is already committed this will increase train loadings and add to road congestion, which in turn will act as a brake on growth. In the context of population and employment growth, transport investment is a key component of a successful recovery. This perspective is supported by the recent London School of Economics Growth Commission report which notes that "transport needs to adapt to a growing population and changing needs in different parts of the country"[18].

1.51 For the remainder of this document we will use the following definitions to describe transport constraints and opportunities:

[18] See London School of Economics Growth Commission, *Investing for Prosperity: Skills, Infrastructure and Innovation* (Jan 2013)

- Constraints – those aspects of the transport network or services where supply does not adequately meet the current or future requirements of the travelling public and of industry, and therefore negatively affects economic outcomes;
- Opportunities – those aspects of the transport network where connectivity enhancements can be proactively provided as part of a wider portfolio to facilitate and deliver economic goals.

1.52 While major transport developments are not always required to deliver growth (there will be cases where growth occurs independently of changes to the transport supply) they are often considered necessary. Moreover, while there are some cases where the supply of transport itself drives economic growth, in a mature economy such as the UK, transport is not usually a sufficient condition for growth in, and of, itself. This issue is considered in more depth in Chapter 2.

2 Transport Supports and Delivers Growth

Summary

- Transport can affect the performance of the economy through a number of important mechanisms
- In order to explain these high level mechanisms, the *Eddington Transport Study* (2006) identified seven microeconomic drivers of economic productivity which transport has the potential to influence
- There is also a considerable body of evidence that links historical 'step changes' in transport provision to past phases of globalisation in the world economy, although in developed economies with mature transport networks the direct mechanisms through which transport investment influences economic outcomes are more challenging to observe and measure
- In addition to delivering improvements in economic performance, transport investment creates opportunities to alter the distribution of economic activity within Great Britain. For example, improving the transport links between areas of economic mass has the potential to:
  - contribute to the attraction and retention of skilled workers;
  - higher individual prosperity;
  - the reduction of deprivation; and
  - delivering economic growth
- At the same time, better transport links will also increase the competitive pressures felt by businesses in those areas where the costs of doing business have fallen.
- Evidence suggests that the specific economic impacts of transport investment are heavily dependent upon the wider economic, social and policy context into which they are placed
- While transport can play an important role in facilitating productivity growth, transport infrastructure alone is unlikely to create economic potential
- Within this context, HS2 should be considered as part of a wider transport strategy for the North, with complementary investment required to create a symbiotic relationship between national and local networks
- Beyond transport, the broader scale and nature of investment required to meet the short to medium term growth aspirations of the North is set out within the Strategic Economic Plans recently prepared by Local Enterprise Partnerships

- However, a longer term view is necessary to draw up investment strategies for enhancing connectivity with and between the North's Core City city regions, as well as taking advantage of the opportunities presented by HS2

Context

2.1 Transport investments can, and generally do, affect the economy. They secure connectivity between different parts of the country as well as to the rest of the world: they link people to jobs; allow products to be delivered to market; underpin supply chains and logistics; and support domestic and international trade. In doing so, transport networks affect the location and pattern of economic activity and, by extension, the scale, nature and pattern of regional growth.

2.2 Understanding the links between the availability of good transport infrastructure and services, and the performance of the wider economy has been the subject of several major studies over a number of decades, including the 1977 ACTRA and 1999 SACTRA reports[19]. More recently, the 2006 Eddington report and its supporting literature has provided a contemporary framework for understanding these effects.

2.3 Many of these Government-sponsored reviews draw upon an extensive evidence base developed by the school of 'New Economic Geography' which has grown in prominence since the early 1990s. This body of work uses economic theory to describe the spatial or geographic arrangement of productive activity within an economy, to identify what drives that pattern of activity, and to understand how that might change through time.

2.4 HS2 Ltd has recently published a comprehensive assessment of the academic and policy evidence base in this field to inform the findings of the Growth Taskforce for HS2. Its *Literature Review on the Economic Benefits of Transport Investment – Implications for HS2* (2014) considers how transport investment can affect both the size of the economy and the distribution of economic activity between different places and groups of people, with particular reference to HS2.

2.5 The literature review identified that:

- "Investment in HS2 will create significant opportunities for the future economy;
- HS2 can deliver improved economic performance;
- In a modern economy the improvements in economic performance delivered by HS2 could occur in a number of ways;
- HS2 also creates opportunities to alter the distribution of economic activity;
- There is no 'one-size-fits-all' approach to maximising the benefits of HS2; and
- HS2 stations bring major opportunities for regeneration and development."

2.6 This Chapter is not intended to duplicate the findings of HS2 Ltd's literature review. Instead it provides a summary of contemporary thinking on how the relationship between transport and the economy works, and the range of complementary measures that will affect the success (or otherwise) of transport investment in delivering economic growth.

[19] ACTRA - Advisory Committee on Trunk Road Assessment and SACTRA - Standing Advisory Committee on Trunk Road Assessment

Transport and the Economy

Economic Performance

2.7 Transport can affect the performance of the economy through a number of important mechanisms. From a macroeconomic perspective transport can:

- Change the number of inputs that are used productively e.g. by improving access to labour or stimulating the creation of new firms;
- Improve the efficiency with which inputs are used e.g. by reducing cost of transporting finished goods; and
- Increase the resilience of the economy to external shocks e.g. by providing the capacity needed to allow individuals and firms to exploit opportunities in high growth sectors.

2.8 In order to explain these high level mechanisms, the *Eddington Transport Study* (2006) identified seven microeconomic drivers of economic productivity which transport has the potential to influence. These drivers were neatly summarised by the House of Commons Transport Committee (2011), as:

- Improved labour market efficiency, enabling firms to access a larger labour supply, and wider employment opportunities for workers and those seeking work;
- Improved business efficiency, notably by travel time savings, improving journey time reliability and travel quality;
- Stimulating business investment and innovation by supporting economies of scale and new ways of working;
- Agglomeration economies which bring firms closer (in space or time) to other firms or workers in the same sector;
- Increasing competition by opening access to new markets, principally by integration of world markets;
- Attracting globally mobile activity to the UK, by providing an attractive business environment and good quality of life; and
- Increasing domestic and international trade by reducing trading costs.

2.9 These impacts are well-grounded in economic theory. SACTRA (1999) found "these theories, which deal with the linkages between transport improvements and economic activity, to be strong. They are internally consistent, and provide insight into a complex pattern of effects leading in different directions"

2.10 There is also a considerable body of evidence that links historical 'step changes' in transport provision to past phases of globalisation in the world economy. For example, the introduction of the UK's canal network in the eighteenth and early nineteenth centuries played a key role in achieving economic growth, delivering much-needed connectivity between sites of industrial activity, urban areas and ports, and providing an economical and reliable way to transport goods and commodities in large quantities[20]. Similarly, railways played a pivotal role in the economic success of the UK economy in the mid-nineteenth century through enabling the rapid movement of large numbers of people for the first time.

[20] See Crafts and Leunig (2005) *The Historical Significance of Transport for Economic Growth and Productivity*

2.11 In developed economies with mature transport networks, however, the direct mechanisms through which transport investment influences economic outcomes are more challenging to observe and measure. It is difficult to demonstrate the causal relationship between changes to the provision of transport and economic outcomes using empirical evidence and it is possible (indeed likely) that the causal relationship runs in both directions. Furthermore, the exact scale and nature of the relationship is much debated.

The Distribution of Economic Activity

2.12 There are a number of reasons why activity and prosperity is not evenly distributed across Britain. Some of these reasons are rooted in the past and reflect the distribution of natural resources, historic trade routes and previous policy decisions. Some reflect the competing forces of agglomeration (which tends to concentrate activity in dense, productive locations) and the cost of delivering a good or service (which tends to disperse activity so that it is produced closer to where it is consumed). Some (as set out in Chapter 1) relate to particular policy initiatives that have allowed regions to exploit their comparative advantage or, conversely, have increased competition with other regions at home or abroad with deleterious consequences.

2.13 In addition to delivering improvements in economic performance, transport investment creates opportunities to alter the distribution of economic activity within Great Britain. The economies of local areas are shaped by their relationships with other areas, including the connections and flows of people to and from home, work and leisure, as well as business-to-business relationships and supply chains.

2.14 Improving the transport links between areas of economic mass has the potential to contribute to the attraction and retention of skilled workers, higher individual prosperity, the reduction of deprivation and delivering economic growth. But at the same time, better transport links will also increase the competitive pressures felt by businesses in those areas where the costs of doing business have fallen.

2.15 These competing effects are sometimes referred to as the 'two-way road' effect, whereby improving the transport links between areas of economic mass has a similar impact to the removal or reduction of a trade barrier. Depending on the structure of local and regional economies there can be winners and losers[21].

2.16 For example, by removing barriers to inter-regional trade the previously inefficient duplication of economic activity between regions may now be satisfied by a smaller number of suppliers who can now serve a larger geographic area. If, however, individual city regions are highly specialised and can exploit their comparative advantages across a broader market area, the opportunities for enhanced levels of inter-regional trade and integration could be considerable. A paper written by Rosewell and Venables (2013) for HS2 Ltd provides a

[21] Care should be taken when defining winners and losers in this context. First, appraisal methods tend to consider scenarios with or without a specific intervention and which do not include complementary or supporting interventions that may mitigate any detrimental impacts. Second, conclusions regarding winners and losers will differ according to the focus of attention e.g. on where output is produced (and income generated), or where the income from output is spent.

theoretical framework to explain the mechanisms by which connecting places may lead to additional productivity gains[22].

2.17 A transformative scheme such as HS2 could affect the balance of these forces and alter the geographical distribution of economic activity across Britain. For example, in their analysis for HS2 Ltd, KPMG (2013) found that the benefits to the North outweighed those to London and South East, with the findings robust to a range of assumptions regarding the strength of competitive pressures following the introduction of HS2[23].

2.18 Finally, it is worth noting that the majority of the literature considers the mechanisms by which transport can help to support, facilitate and deliver economic opportunities. As noted previously, however, the direction of causality is also likely to run in the opposite direction. In other words, economic outcomes may drive the requirement for additional transport connectivity.

2.19 While Government policy can provide the conditions needed to influence the broad distribution of growth, it cannot precisely control the location and level of economic activity. Therefore it is important that sufficient infrastructure and services are available to prevent transport becoming a constraint on growth.

2.20 Over the past forty years the UK approach to transport planning has been to identify incremental investments to ensure that the balance between the supply and demand for transport is 'just right', sometimes referred to as 'predict and provide'. Where transport constraints are binding, however, this may go unobserved by the current approach. In the context of a broader economic plan to deliver a Northern Powerhouse infrastructure to have spare capacity is needed in order to take advantage of new opportunities as they emerge. By recognising the need for flexibility to promote change and development, it can be ensured that transport networks are resilient to a range of potential economic scenarios in the future. However, this does not necessarily mean all transport infrastructure enhancement is worthwhile. Over-provision of capacity where it is not needed will be a wasteful use of scare resources.

Complementary Measures

2.21 Evidence suggests that the specific economic impacts of transport investment are heavily dependent upon the wider economic, social and policy context into which they are placed. They may vary according to the quality of the existing transport networks, the level of economic development, the nature of competition and the range of complementary measures deployed in the area[24].

[22] See Rosewell and Venables (2013) , *High Speed Rail, Transport Investment and Economic Impacts*, HS2 Ltd

[23] See KPMG (2013), *HS2 Regional Economic Impacts*

[24] See Laird and Mackie (2010), *Review of Methodologies to Assess Transport's Impacts on the Size of the Economy* , Northern Way

2.22 Furthermore, while transport can play an important role in facilitating productivity growth, transport infrastructure alone is unlikely to create economic potential[25]. In particular, it is widely accepted that the positive effects of transport investment, and its magnitude, are dependent on certain pre-conditions complementing any transport provision. Influences include:

- Economic conditions – a stable macroeconomic policy climate, local market circumstances, agglomeration, and labour market conditions;
- Investment conditions – the availability of funds, timing and structure of investment, type of infrastructure investment, location of investment in terms of network structure; and
- Political and institutional conditions – decision making, planning, sources and methods of finance, level of investment (local, regional or national), supporting organisational/institutional policies and processes, and methods and governance of infrastructure delivery and provision.

2.23 Within the context of HS2, the HS2 Growth Taskforce was asked to identify the main challenges for maximising the benefits from HS2, and set out recommendations on what should be done to address these. Its initial report *HS2 Growth Taskforce: The Challenge* (2013) acknowledges that HS2 is likely to mean different things to different places, and that economic opportunities will vary by location. More importantly, however, it acknowledges that improved transport connectivity is only one part of a wider portfolio of measures that is needed to ensure success.

> "Local areas will need integrated strategies spanning transport and regional connectivity, growth, regeneration, housing, skills and employment in order to turn visions of growth and regeneration into reality" (HS2 Growth Taskforce, 2013)

2.24 In its final report the HS2 Growth Taskforce identified nineteen recommendations spanning issues as broad as governance, devolution, planning, skills, communication, education, procurement, industrial relations and working practices[26]. Many of these have since been taken forward, including the establishment of the HS2 Skills College in Birmingham and Doncaster, and the location of HS2 Ltd's construction headquarters in Birmingham.

2.25 While it is important to bear in mind this broader context throughout, the remainder of this report limits its focus to consider the role of HS2 as part of a wider programme of transport improvements for delivering the Government's aspirations for balanced and widespread growth. It describes how HS2 could affect constraints and opportunities on the transport network in the north of England, but is not intended to identify or recommend a comprehensive cross-sector solution to facilitate and deliver growth in the North.

[25] For example Canning and Fay (1993) suggest that transport infrastructure should not be viewed as a productive input but as a precondition for high growth.

[26] See HS2 Growth Taskforce (2014), *HS2 Growth Taskforce: Get Ready*

2.26 From a narrow transport perspective, some of this portfolio of complementary and supporting schemes has already been identified and is being delivered through existing channels, for example as described in *Action for Roads: A Network for the 21st Century* (DfT 2013) or Network Rail's *Industry Strategic Business Plan* (2013).

2.27 Separately, the recent One North publication *A Proposition for an Interconnected North* (2014) sets out a strategic proposition for transport in the North as viewed by the city regions of Leeds, Liverpool, Manchester, Newcastle and Sheffield. This places transport at the heart of an ambition to maximise economic growth in the north, delivering "a highly interconnected region of thriving cities and towns, providing a valuable counterweight to London".

Strategic Economic Plans

2.28 Beyond transport, the broader scale and nature of investment required to meet the growth aspirations of the North is set out within the short to medium term Strategic Economic Plans recently prepared by Local Enterprise Partnerships to support their bids to secure Local Growth Deals. It is generally recognised by the North's Core City city regions that a longer term view is necessary to draw up investment strategies for enhancing connectivity both within and between their city regions, as well as taking advantage of the opportunities presented by HS2.

2.29 This section provides an overview of the Strategic Economic Plans for the five city regions in the North, with a particular focus on the expected role of transport in securing economic growth. In April 2014 Combined Authorities were established for the Liverpool City Region, North East, Sheffield City Region and West Yorkshire, adding to the already established Combined Authority for Greater Manchester. These bring together local transport authority powers and those for economic development within one body.

2.30 In reviewing the Strategic Economic Plans, it is evident that each city region is seeking structural change in its economy, with a particular focus on specialisation and exploiting comparative advantages. While, in practice, it is unlikely that every City Region will achieve all of the ambitious goals described in the Strategic Economic Plans, even partial success would lead to travel and trip growth in excess of that projected by the Department for Transport's National Trip End Model (NTEM). In other words, even with partial success of the Strategic Economic Plans, the demand for travel is likely to exceed the conservative assumptions used to constrain HS2 Ltd's own forecasts of the future demand for travel. Furthermore, HS2 is likely to stimulate growth which is not accounted for by NTEM. This could change the requirements of the transport networks in the places affected, as well as the benefits and so value of transport investments.

Leeds City Region

2.31 The Leeds City Region Local Enterprise Partnership's Strategic Economic Plan sets out proposals that will deliver up to 62,000 new jobs once implemented. Growth is planned across the City Region, but with particular focus on Leeds City Centre and other urban centres, together with the Aire Valley Enterprise Zone and a growing business offer linked to the Leeds Bradford Airport.

2.32 The West Yorkshire Combined Authority has established the £1 billion West Yorkshire Plus Transport Fund which is focussed on delivering a step change in local inter-urban and intra-urban connectivity to support growth, supported by a new single transport plan covering the

area. This plan is currently under development and will be informed by work being undertaken to assess both the economic impact and the connectivity requirements, of HS2.

2.33 The arrival of HS2 into Leeds is expected to deliver a significant economic boost to an economy which, in the Leeds City Region context, is already relatively strong. Connectivity, particularly between HS2 and Leeds city centre, is seen as being of fundamental importance to maximising the economic benefits of HS2. The polycentric nature of the West Yorkshire economy also means that connectivity between Leeds city centre and other urban centres such as Bradford, Wakefield and employment clusters such as the Aire Valley Enterprise Zone will be of particular importance. A local connectivity study is now underway.

Liverpool City Region

2.34 Transport connectivity is at the heart of the Liverpool City Region Local Enterprise Partnership's Strategic Economic Plan. The SEP sets out the ambition to grow the employment base by 11% by 2030, increasing employment numbers by approximately 100,000. As well as growth in and around Liverpool city centre, regeneration projects such as Wirral Waters and Liverpool Waters are identified as focal points for growth. Growth sectors include those in the knowledge economy, low carbon industries and the logistics hub known as Superport. Transport connectivity is seen as key, including intra-regional connectivity to support growth at key employment sites and inter-regional connectivity to support port and logistics activity and the thriving visitor economy.

2.35 The borough of Halton is now an integral part of the Combined Authority, extending its geographical coverage beyond the former Metropolitan County of Merseyside. Throughout this report where we say Merseyside we refer to the former Metropolitan County and Halton.

2.36 Transport investment featured strongly in the City Region's SEP and the award of £232.3m Local Growth Fund money in the Liverpool City Region Growth Deal will support the delivery of 13 local transport schemes designed to improve connectivity across the City Region.

2.37 Liverpool City Region has been keen to build the case for a direct HS2 link to Liverpool and has therefore undertaken work to better understand the economic benefits of High Speed rail for the City. Notwithstanding this, the City Region has been considering the connectivity requirements of the current Lime Street station to cater for two "classic-compatible" HS2 services per hour, as well as the regeneration opportunities for development of land adjacent to the station, badged the Lime Street Gateway.

2.38 The Merseyrail network will be key to meeting future connectivity requirements. Since it is already the most intensively used rail network outside of London, investment is proposed to significantly improve station and train capacity to meet future demand. On the Strategic Road Network, the principal focus is on improving connectivity to the Port of Liverpool and the reliability of the motorway box (M57, M58, M53, M6, M56) serving the City Region. East to west connectivity is affected by the capacity of the M62, and as traffic levels rise, also the M56. Aspirations remain strong to improve the international connectivity offered by Liverpool John Lennon Airport.

Greater Manchester

2.39 Intra-regional connectivity has been a key driver of Greater Manchester's investment priorities since the publication of the Manchester Independent Economic Review (MIER) in 2009. This

identified the key future employment growth sites in Greater Manchester as being the City Centre together with the Oxford Road corridor, Salford Quays, and the Etihad Campus all referred to as the Regional Centre; Trafford Park/Port Salford; and, Airport City. The Greater Manchester Transport Fund was established to support investment into improved connectivity across Greater Manchester to those sites, including through the expansion of the Metrolink system.

2.40 The Greater Manchester LEP's Strategic Economic Plan (SEP) confirmed the importance of these three growth areas and highlighted their potential to deliver an additional 120,000 new jobs over the next twenty years – with 70% of this growth happening in financial, commercial and professional services. Within the total increase in employment, Salford Quays/Media City is planned to rise from 21,500 to 36,000 and Trafford Park from 35,000 to 48,000. Planning for future connectivity to these sites is advanced, building upon transport investment (particularly in Metrolink) to date.

2.41 The Greater Manchester Local Growth Deal awarded a £476.7m Local Growth Fund to the City Region, which will deliver a number of local transport investments to support city centre access, including interventions on the Inner Ring Road and additional platforms at Salford Central station, as well as additional vehicles for Metrolink.

2.42 Work has been undertaken by Greater Manchester partners to assess both the growth benefits and connectivity requirements of the planned HS2 stations at Manchester Piccadilly and Manchester Airport. Stakeholders in Greater Manchester are keen to link together HS2 proposals for Piccadilly with Network Rail's own plans for the station and the Combined Authority's ambitions for the station and regeneration of the surrounding area. These include plans to improve bus and Metrolink penetration and connectivity to the station site to create a fully integrated Hub station for both HS2 and east-west services.

2.43 Greater Manchester has been leading thinking on broader east-west connectivity. The growth of a strong logistics offer through the Atlantic Gateway links to Liverpool City Region is promoting the exploration of strategic road linkages (M56/M6/M62) westwards. Labour market connectivity and agglomeration is pushing similar considerations in the triangle between Leeds, Sheffield and Greater Manchester.

2.44 Finally, it is worth noting that the Greater Manchester SEP is promoting public service reform alongside growth as a means of ensuring the sustainability and efficiency of the growth agenda. This could have implications for the way that local bus and rail services are delivered moving forward. They are also investing significantly on supporting local connectivity to strategic transport corridors, ensuring that the first and last miles of journeys are such that there is maximum labour market mobility.

North East

2.45 The North East's Strategic Economic Plan (SEP) sets out the target of increasing employment in the SEP area (the five Tyne and Wear authorities plus Northumberland and Durham County Councils) to 1 million from the current baseline of 900,000. Transport features strongly in the SEP.

2.46 The SEP identifies a clear focus on the urban centres within the North East as locations for growth. This includes the centres of Newcastle, Gateshead, Sunderland and Durham.

Connectivity to these urban centres is recognised as a key priority both through proposals for current Metro upgrades, including new vehicles, but also through the potential extension of the Metro by 2030 to areas of the Tyne and Wear conurbation not currently served.

2.47 Partners in the North East have begun to plan for the arrival of HS2 services in the early 2030s. Investment now in Newcastle Central station is seen as a forerunner of the improvements needed both to accommodate high speed services, e.g. longer platforms, as well as improve the connectivity between the station and the city centre employment areas. The crucial role that the Metro will play on wider connectivity is recognised and is central to the plans for its upgrade and extension.

2.48 Finally, the North East is alive to its international connectivity requirements, with clear aspirations for establishing transatlantic connections from Newcastle Airport and proposals for port growth at the Tyne, Sunderland and Blyth.

Sheffield City Region

2.49 The Sheffield City Region's Local Enterprise Partnership believes that the measures contained within its Strategic Economic Plan could deliver an additional 70,000 jobs, of which 30,000 jobs are in higher skilled professions. The SEP identifies several priority areas for this growth including: Dearne Valley and J36 M1; Robin Hood Airport/Doncaster-Sheffield Corridor; Markham Vale (in partnership with the adjoining D2N2 LEP area); A61 Corridor; Sheffield City Centre and the centres of Doncaster, Barnsley and Rotherham, the Sheffield-Rotherham Don Valley Corridor, and the DN7 Initiative.

2.50 The City Region has established both an Infrastructure Investment Plan and an associated Investment Fund. The Sheffield City Region Growth Deal provided a £295.2m Local Growth Fund to the city region in support of its growth aspirations. Transport and connectivity feature strongly in the investment priorities that this will enable.

2.51 The City Region is alive to the opportunities that HS2 will bring and has undertaken a connectivity study for the proposed site at Meadowhall, which has demonstrated the importance of improving connectivity, e.g. through tram-train or Strategic Road Network improvements at M1 J34, to both Sheffield City Centre and other parts of the South Yorkshire conurbation. In addition to tram-train, bus rapid transit, park and ride and addressing pinch points are all seen as key components of intra-regional connectivity to maximise the benefit of HS2 services.

2.52 Inter-regionally, the need for enhanced east-west connectivity to Manchester and Manchester Airport is identified. The DfT-sponsored Trans-Pennine Feasibility Study, currently underway, is expected to recommend improvements to the A628/A57 corridor. Connectivity north to Leeds is also a key priority for Sheffield, both on rail with a metro style service seen as desirable and on the Strategic Road Network through managed motorways on the M1. Maximising the potential for freight is also highlighted, particularly enhanced connectivity eastwards to the Humber Ports, which is seen as key to supporting the City Region's ambitions for logistics.

Core Markets

2.53 As emphasised in the Strategic Economic Plans described above, the role of city regions in supporting economic growth in the north of England should not be understated. Like any other country our cities make a disproportionate contribution to economic output and, as the

previous section established, those cities have aspirations to ensure their economic potential is fulfilled.

2.54 The following Chapters consider both current and future constraints and opportunities for the transport networks, and highlight the role that HS2 can play as part of a broader package of investment to deliver growth and opportunities in the north of England.

2.55 In order to provide structure we have adopted a definition of travel markets in line with the Eddington study's three strategic priorities. This definition focuses on the three markets for travel that are expected to have the greatest connection with economic outcomes, and therefore the success of the UK economy. They are:

- **Journeys between city regions** - inter-urban corridors where the lack of connectivity and increasing unreliability of the transport network is adding costs to business, threatening productivity and innovation in the freight and logistics industries and inter-regional trade.
- **Journeys within city regions** - urban areas where rapid economic growth (often evidenced by higher land values, labour shortages and congestion) is coupled with a lack of capacity in the transport system. Increasing congestion and capacity constraints threaten to impede growth and dampen the boost to national productivity offered by urban agglomerations.
- **Journeys to/from international gateways** - the major international passenger routes and principal international freight routes, where poor connectivity and delays on surface access routes, and their current and future capacity constraints have the potential to damage the competitiveness of the North's imports and exports, and the attractiveness of the North for foreign direct investment

2.56 For each of the markets identified we describe the set of constraints and opportunities across all relevant modes and journey purposes, both now and in the future. Where possible we go on to describe the range of activities (investment, regulation, policy) that could help to relieve observed constraints and realise future opportunities. As mentioned previously, however, local context is essential to convert broad policy prescriptions into specific and definitive local actions. The link between transport and the economy is not uniform and further detailed analysis will be needed to understand the role that HS2, as a constituent part of a portfolio of transport improvements, can play within the wider economic vision for each of the city regions in the North.

3 Extending Markets: Travel Between City Regions

Summary

- Transport connectivity from the North to London with its World City functions in sectors such as finance, legal and advertising as well as its role as the nation's capital and largest domestic market will be one of the underpinning features of the North's economic future
- Growth in the service sector in the North will increase demand for travel between the North's city regions and to city regions elsewhere in the country for business purposes and due to extending labour markets
- But at the moment, commuting between the two largest city regions in the North – Leeds and Manchester – is less than expected and this is attributed to the poor connectivity between them
- The Strategic Road Network in the North is congested and this leads to extended journey times, day-to-day variation in travel times and significant disruption through accidents and incidents
- The trans-Pennine road network has limited resilience, particularly in times of inclement weather
- Even with the current programme of investment, there will remain a number of gaps – that is discontinuities in capacity and road standard - in the North's Strategic Road Network
- There are also pinch points, particularly where the Strategic Road Network and local roads interface
- With economic growth, road traffic is forecast to grow increasing the pressure on the Strategic Road Network
- Managed motorways and capacity upgrading will provide some relief, but only for the medium term
- Even with the committed programme of enhancements by 2040 congestion on the Strategic Road Network is forecast to increase and be experienced over a greater extent of the network than now
- Within the North, the longer distance rail network is slow when compared with the car alternative and some of the longer distance rail routes elsewhere in the country. It has a relatively low frequency and many routes have inadequate train capacity to cater for current demand
- Despite this, rail passenger numbers have grown so on-train crowding has worsened

- There is committed investment – Northern Hub, North West electrification, trans-Pennine electrification – that will increase network capacity and improve journey times
- Rail passenger numbers are forecast to continue to grow and further investment in network enhancement will be needed if the North's inter-city region rail network is to grow to its full potential to accommodate and facilitate the increase in longer distance travel that a growing northern economy will require, and if it is to provide an attractive alternative to an increasingly congested road network

Travel Between City Regions

3.1 The importance of transport connectivity to London, with its World City functions in sectors such as finance, legal and advertising, as well as its role as the nation's capital is recognised across the North[27]. The Strategic Economic Plans for the North's Core City city regions acknowledge that enhancing connectivity to London – in terms of both journey time and the capacity of the networks – will support economic growth in the North by allowing northern city regions to exploit their comparative advantages. This is a perspective shared by the Northern Way and think tanks such as the Centre for Cities[28].

3.2 Similarly, there is a recognition that city centre focussed growth across the North in the service sectors will lead to growth in the demand for travel between city regions[29], both for business travel and by extending journey to work markets for commuting trips. With regard to the latter, the Spatial Economics Research Centre (SERC) found that commuting between the Manchester and Leeds City Regions is about 40% lower than expected given the characteristics of the two cities and the physical distance between them[30]. SERC (2009) identified the overall high perceived costs of commuting (including the time taken, the frequency of services, the impact of over-crowding etc.) as the main cause of this lower level of commuting.

3.3 For the North's city regions to exploit their comparative advantages and grow to the full extent of their potential, the conclusion is that there is a *requirement* for the demand for business to business and commuting travel between the city regions of the North to grow. At present though, and as shown in Table 3.1 there is only limited commuting between city regions in the North. For example, barely 2% of all commuting trips originating in the Greater Manchester City Region (886,608) have a destination within the Merseyside City Region (18,539). The equivalent percentage for many other city region pairs is lower still.

[27] For example see Northern Way *Strategic Direction for Transport*, Rail North's *Long Term Rail Strategy*, Strategic Economic Plans

[28] See The Northern Way Transport Compact *The Economic Case for Transport Investment in the North* and Centre for Cities, *Where are the Priority Linkages for Transport Investment to Maximise Economic Growth in the North?*

[29] For example see Centre for Cities (2014) *Where are the Priority Linkages for Transport Investment to Maximise Economic Growth in the North?*

[30] See Overman, Gibbons, D'Costa, Mion, Pelkonen, Resende and Thomas (2009), *Strengthening Economic Linkages Between Leeds and Manchester: Feasibility and Implications*, Spatial Economics Research Centre

3.4 As a proxy for economic activity, the low level of commuting between city regions suggests there is limited integration between the city economies in the North. We would expect the emergence of a 'Northern Powerhouse' to increase the demand for travel between cities in the North, but without improvements to connectivity the transport networks could act as a constraint on this growth.

Table 3.1: Daily Commuting to/from City Regions in the North

From ↓ : To →	Greater Manchester	Merseyside	South Yorkshire	Tyne and Wear	West Yorkshire	All Other
Greater Manchester	766,122	18,539	1,312	295	8,558	91,782
Merseyside	21,867	394,208	311	242	1,424	68,641
South Yorkshire	3,422	362	363,142	276	25,845	42,567
Tyne and Wear	420	139	271	318,022	912	47,978
West Yorkshire	11,285	785	14,730	538	671,710	44,168

Data Source: 2011 Census Travel to Work data, Steer Davies Gleave analysis

3.5 There are increasingly important visitor economies in the northern cities, and the leisure market in the North is growing. Taking the Liverpool City Region as an example, their Strategic Economic Plan[31] identifies that it currently attracts 55 million visitors a year and is ranked fifth of all UK cities and towns in terms of international visitors. The SEP highlights both the current importance of the visitor economy as a key employer and its considerable growth potential. Other Core City city region economies have their own particular visitor economies. A growing visitor economy creates new demands for transport connectivity, including at the weekends and in the evenings.

3.6 It is this combination of enhanced business to business interaction, expanded and overlapping labour markets and greater cultural and social exchange that will underpin the Northern Powerhouse described by the Chancellor in his June 2014 speech[32].

3.7 Through providing high speed links on its own network and by releasing capacity, allowing extensive changes to service patterns on the classic rail network, HS2 will transform the connectivity between the North and London, as well as between the North and Birmingham and between some destinations wholly within the North, e.g. Leeds and Sheffield. The journey time reductions HS2 will bring and the capacity it will provide will be truly transformational. However, within the North, journeys by rail over what are actually relatively short distances are slow, regularly over-crowded and of variable quality. Committed enhancements will lead to some worthwhile improvements, but all the evidence is that constraints will remain.

[31] Liverpool City Region LEP (2014) *Liverpool City Region Growth Plan & Strategic Economic Plan*

[32] https://www.gov.uk/government/speeches/chancellor-we-need-a-northern-powerhouse

3.8 The Strategic Road Network within the North, like the rest of the national network, experiences congestion, most notable around the city regions where it has the twin functions of providing for longer distance travel for people and goods, while being an integral part of local commuter networks. On top of this, the Pennines create particular challenges for network resilience. Across the North there are some evident gaps (capacity discontinuities) in the Strategic Road Network.

Trip Making by Road

3.9 Even when the Strategic Road Network is not congested, journey times between some city pairs are long relative to the distance between them. Free-flow journey times, that is assuming no congestion between city centres, are provided in Table 3.2. It can be seen that despite a distance of just 42 miles, the journey between Manchester and Sheffield takes well over an hour in uncongested conditions, representing an average journey speed of less than 35 miles per hour.

Table 3.2: Free-flow road journey times (hrs:mins)

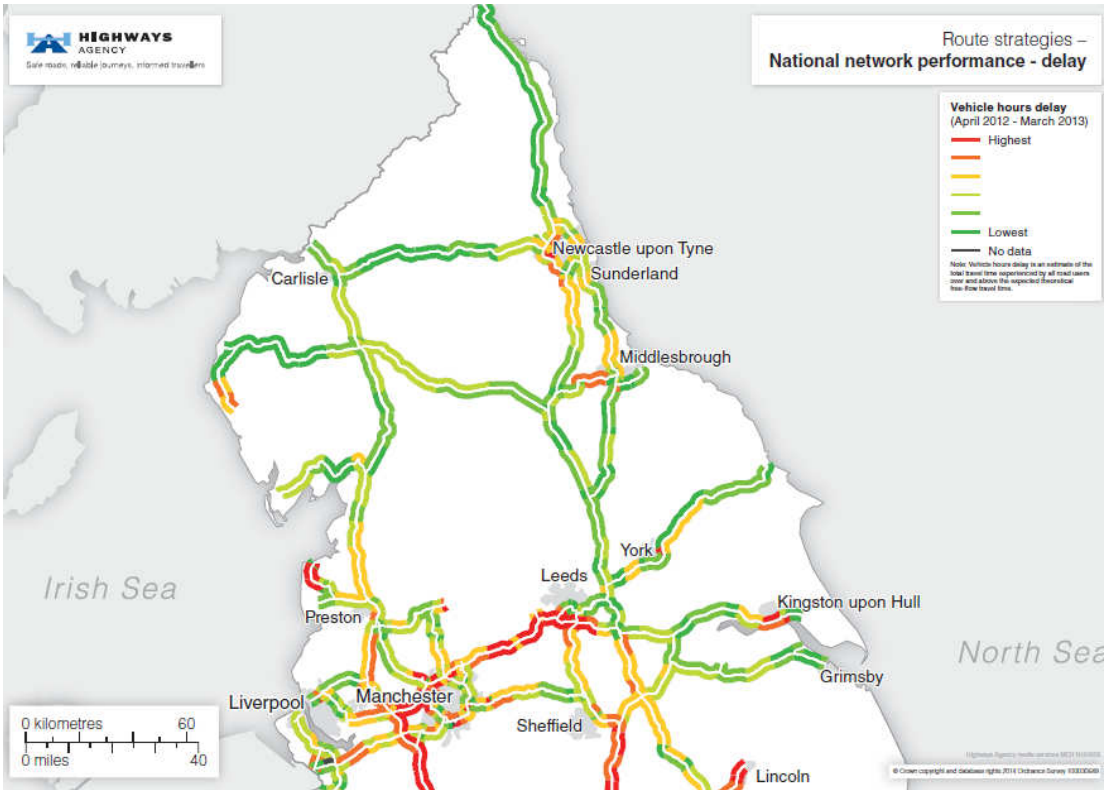
	Manchester	Liverpool	Leeds	Sheffield	Newcastle-upon-Tyne
Manchester					
Liverpool	0:45				
Leeds	0:56	1:18			
Sheffield	1:14	1:47	0:49		
Newcastle-upon-Tyne	2:52	2:50	1:42	2:14	

Data source: Google Maps journey planner (accessed 7 October 2014)

3.10 The North's Strategic Road Network is congested – demand exceeds supply. Congestion does not just occur in the traditional commuting peaks and in and around the North's city regions – it can also occur between the peaks and at weekends. Figure 3.1 shows the Highway Agency's assessment of where delays currently occur on the Strategic Road Network and their severity. From this it can be seen that the M1 approaching Sheffield from the south, the M6 approaching the Manchester and Liverpool city regions from the south, the M62 between Leeds and Warrington and sections of the M60 around Manchester all experience the highest levels of delay.

3.11 The consequence of congestion is not simply extended journey times. It also makes journey times less reliable and increases day-to-day variation in travel times. Highly congested networks experience greater numbers of accidents and incidents, and when these do occur, they have a greater impact. Both these effects incur economic costs.

Figure 3.1: Highways Agency assessment of delays on the Strategic Road Network, April 2012 to March 2013



Source: Highways Agency

3.12 Of course, these impacts are not unique to the North. However, what is particular to the North is the limited resilience of the Strategic Road Network to disruption, particularly for trans-Pennine movements. The M62 is the only trans-Pennine motorway and a large proportion of its traffic is freight – for example, on the section between Leeds and Bradford 15% of the vehicle flow is heavy goods vehicles[33]. This is equivalent to 7,000 to 8,000 vehicles a day. As the Highways Agency note in its M62 Route Based Strategy, the M62 is the highest altitude motorway in the country and it can be severely weather affected. Both the A628 between Manchester and Sheffield, and the A66 between Scotch Corner and Penrith, also regularly experience weather related disruption.

3.13 Air quality issues are an important consideration. Local areas surrounding sections of the motorway network experience concentrations of pollutants close to, or in excess of, European prescribed limits. Examples include the M1 east of Sheffield[34] and the M60 north of Manchester. Even with improved emission characteristics of the national vehicle fleet, any further traffic growth has the potential to worsen these conditions. Air quality considerations

[33] Highways Agency (2013) *M62 Junctions 18-29 Route Based Strategy*

[34] In 2014, the Highways Agency consulted on a proposal to lower the speed limit to 60 mph between 7am and 7pm on the M1 between Junctions 28 and 35a to mitigate adverse impacts on local air quality. Ultimately, it was decided not to proceed with the proposal because of its economic consequences. Air quality problems remain however.

may provide tangible constraints to traffic generating development close to the Strategic Road Network.

3.14 The Highways Agency is currently implementing a programme to introduce Managed Motorways across the North on the following sections of the North's motorway network:

- M1 J28-31
- M1 J32-35a
- M1 J39-42
- M62 J25-30
- M62 J18-20
- M62 J8-18

3.15 Once fully implemented these will provide extra capacity and, together with the management of traffic speeds, this will reduce day-to-day journey time variability and the number of incidents and accidents. Integral to Managed Motorways is the use of Highways Agency Traffic Officers (HATOs) to minimise the disruption that incidents cause when they do occur. However, these enhancements will only provide a relatively short term solution with just 10-15 years relief. The Highways Agency suggests, for example, that even with Managed Motorway sections on the M62 the route will be again reaching capacity by 2028[35].

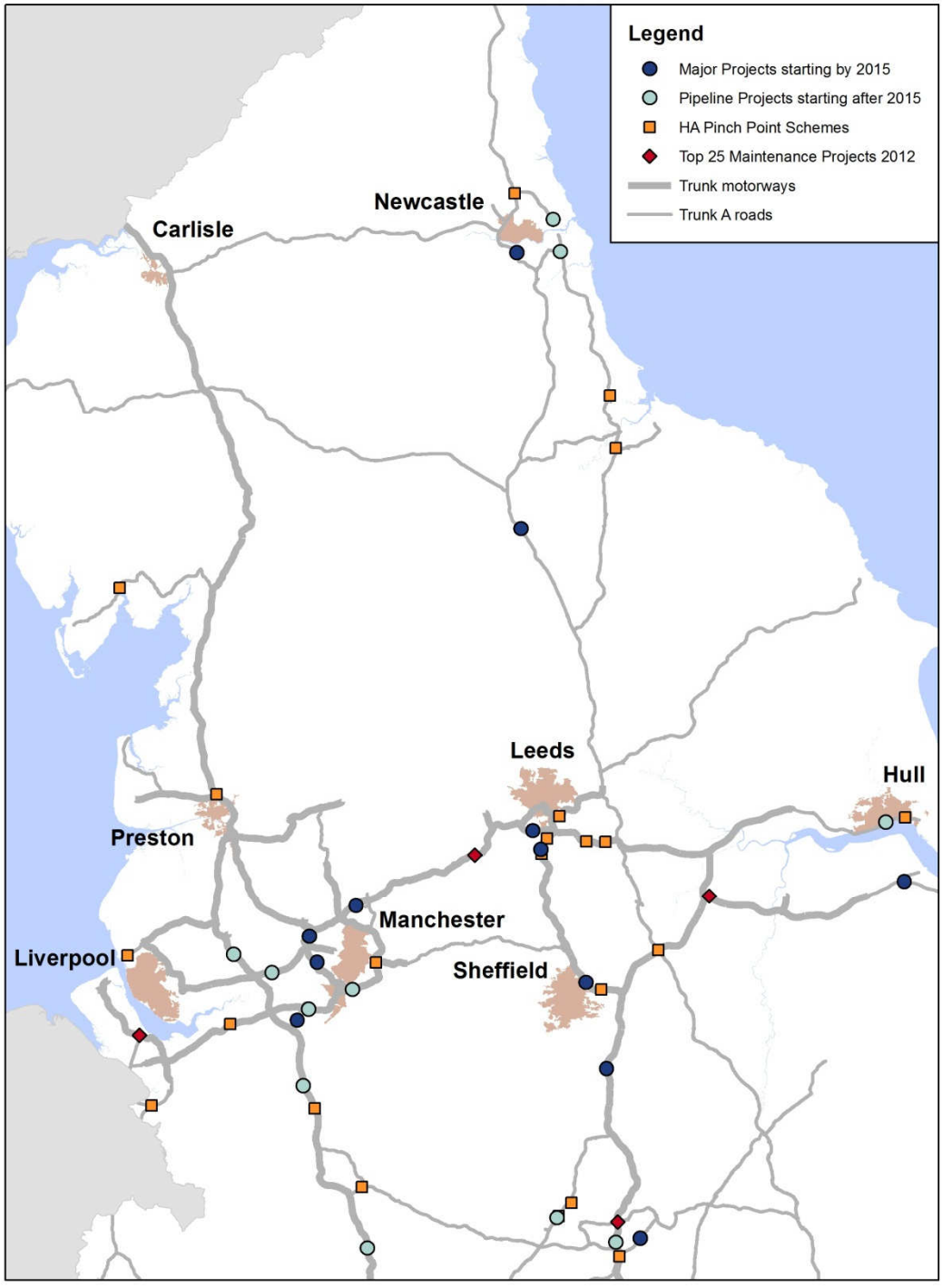
3.16 The North has a number of 'network gaps' in the Strategic Road Network – these are sections of road where there is a marked discontinuity in capacity and design speed compared with the surrounding network. A number of these are currently being addressed as part of the Highway Agency's current programme, and include the A556 which links the M6 to the M56 and is the principal road access route to the Manchester city region from the south, and, the upgrading of the A1 between Leeming and Scotch Corner in North Yorkshire. A summary of the Highways Agency's current investment programme is provided in Figure 3.2.

3.17 Finally in this section, it is noted that almost all journeys that use the Strategic Road Network, whether they be by car or goods vehicle, have access legs using local roads. In the next Chapter, we set out the constraints and opportunities facing local roads within the North's city regions. While the focus of this Chapter is on the Strategic Road Network, it is important to recognise that the local road network is an integral part of the network that connects the North's city regions.

- The Strategic Road Network in the North is congested and this leads to extended journey times, day-to-day variation in journey times and disruptive accidents and incidents. These affect personal travel and the movement of goods. These all have an economic cost.
- The trans-Pennine road network has limited resilience, particularly in poor weather conditions
- There are a number of network gaps in the North, as well as pinch points at the interface of the Strategic Road Network and local roads

[35] Highways Agency (2013) M62 Junctions 18-29 Route Based Strategy

Figure 3.2: Highways Agency Investment Programme



Source: Highways Agency

Trip Making by Train

3.18 Inter-regional and long distance rail services in the North are provided by a number of rail operators. These include the franchised operations of East Coast, East Midlands Trains and Virgin West Coast, which along with open access operators Hull Trains and Grand Central provide links to London and intermediate destinations, as well as First Trans Pennine Express, East Midlands Trains, Cross Country, Northern Rail and Arriva Trains Wales that provide longer distance connectivity within and beyond the North. These services operate on a predominantly two-track railway multi-use network that is catering for inter-city, longer distance, local and freight movements all on largely Victorian-era infrastructure.

3.19 Looking at England as a whole, as shown in Table 3.3, rail's market share increases with travel distance. There is no reason to believe that this national picture is not equally true in the North. Rail's mode share will be greater still for those journeys with one or both ends of the journey in the centre of one of the Core Cities (notwithstanding that these journeys are comparatively slow when compared with inter-city journeys to London and some journeys over similar distances in the South East).

Table 3.3: Rail's Share of Trips by Distance (2013)

Travel Distance	Rail Share of Total Travel
Under 1 mile	0.0%
1 to under 2 miles	0.1%
2 to under 5 miles	0.7%
5 to under 10 miles	2.4%
10 to under 25 miles	6.9%
25 to under 50 miles	12.5%
50 to under 100 miles	13.2%
100 miles and over	17.4%

Data Source: NTS Table 0309 – data is for England as a whole

3.20 Like rail demand in the rest of the country, longer distance rail passenger numbers have been growing in the North. Data published by the Office of Rail Regulation (ORR) shows that between 1995/96 and 2012/13 the number of rail trips between each of the three Northern regions and all other regions (that is typically longer distance trips) grew by:

- North East +97%
- North West +113%
- Yorkshire & the Humber +123%

3.21 Over the same period total national growth in rail journeys was 97%. Shown in Table 3.4 is the rate of growth in rail trip making between the North's Core Cities, again over the period 1995/96 and 2012/13.

Table 3.4: Rail Passenger Demand Growth 1995-96 to 2012-13 (journeys, all ticket types, both directions)

	Leeds	Liverpool	Manchester	Newcastle	Sheffield
Leeds		87%	265%	244%	235%
Liverpool			190%	12%	117%
Manchester				142%	209%
Newcastle					83%
Sheffield					

Data Source: Rail Usage and Demand Driver dataset (journeys data based on LENNON). This table has been produced using a draft of the Rail Usage and Demand Driver dataset and has not been formally signed-off by the Department for Transport.

3.22 It can be seen that there has been very strong growth on some routes, but in relative terms growth between some city pairs is smaller than might be expected given the distance between the cities. Low growth between Liverpool and Newcastle is the most notable outlier within Table 3.4, and may reflect the relatively poor rail connectivity between the two cities as shown in Table 3.5. In contrast with the other city pairs in the Table there was no direct service between Newcastle and Liverpool (although a direct service was introduced in 2014).

3.23 Shown in Table 3.5 is Rail North's analysis of rail journey times between the five northern Core Cities and in Table 3.6 from the northern Core Cities to major cities elsewhere in the country. As can be seen these journeys are slow, with average speeds typically worse than the same journeys made off-peak by car. Other than between Liverpool and Manchester and Manchester and Leeds, few city pairs are served by more than two direct trains per hour.

Table 3.5: Rail Journey Times within the North

City	Measure	Manchester	Leeds	Liverpool	Newcastle	Sheffield
Manchester	Trains Per Hour					
	Time (Hours)					
	Speed (mph)					
Leeds	Trains Per Hour	5				
	Time (Hours)	00:52				
	Speed (mph)	48				
Liverpool	Trains Per Hour	4	1			
	Time (Hours)	00:45	01:39			
	Speed (mph)	47	47			
Newcastle	Trains Per Hour	1	2	1		
	Time (Hours)	02:26	01:29	03:03		
	Speed (mph)	61	71	60		
Sheffield	Trains Per Hour	2	2.5	1	2	
	Time (Hours)	00:58	00:40	01:55	02:04	
	Speed (mph)	44	57	40	63	

Data Source: Rail North (2014) Long Term Rail Strategy

Table 3.6: Rail Journey Times to/from major cities outside the North

City	Measure	Manchester	Leeds	Newcastle	Liverpool	Sheffield
Birmingham	Trains Per Hour	2	1	2	2	2
	Time (Hours)	01:27	01:58	03:13	01:43	01:11
	Speed (mph)	57	60	65	55	65
Bristol	Trains Per Hour	1	1	1	[1]	1
	Time (Hours)	02:59	03:31	04:59	03:10	02:47
	Speed (mph)	59	60	65	57	61
Edinburgh	Trains Per Hour	0.5	1	3	[2]	1
	Time (Hours)	03:09	03:00	01:26	03:36	03:41
	Speed (mph)	81	72	87	61	69
Glasgow	Trains Per Hour	0.5	0.5	0.5	[2]	0.5
	Time (Hours)	03:12	04:08	02:26	03:20	04:28
	Speed (mph)	70	55	71	67	60

Data Source: Rail North (2014) Long Term Rail Strategy. Square brackets indicate no direct train

3.24 For journeys with a distance less than 50 miles (which includes many of the city pairs in the North), Network Rail[36] has identified that the best possible future service would have a 'turn up and go' frequency[37] and an average station to station speed in excess of 60 mph. Rail services in the North fall well short of this aspiration.

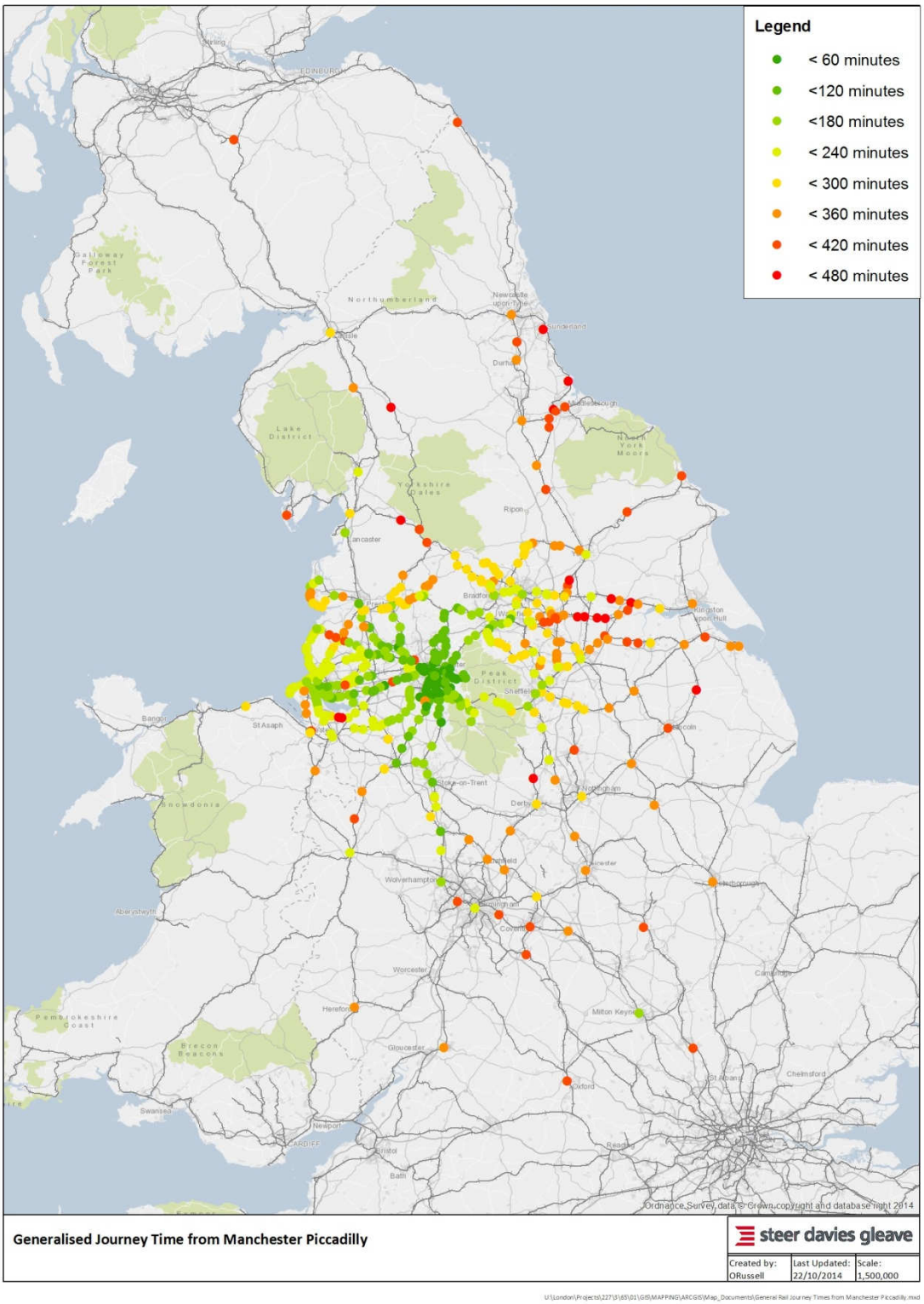
3.25 Figure 3.3 and Figure 3.4 show for commuting journeys the generalised journey times (a measure of connectivity combining journey time, frequency and any requirement to change trains) for trips to the centre of Manchester and the centre of Leeds respectively. These are for a 'without-scheme' scenario in 2036, so they include the impact of committed investment in the rail network (see below) but they do not include the impact of HS2. From this it can be seen that:

- Typically, Manchester has better rail connectivity to stations to the west of the city centre, than to the east across the Pennines. There is also good connectivity on a north-south axis, particularly to/from places along the West Coast Main Line;
- The connectivity of Leeds is generally more constrained than Manchester, with the most accessible locations on a north-south axis. In addition to restricted connectivity to the west across the Pennines, locations to the east are also less well connected.

[36] See Chapter 7, Network Rail (2013) Long Term Planning Process Long Distance Market Study

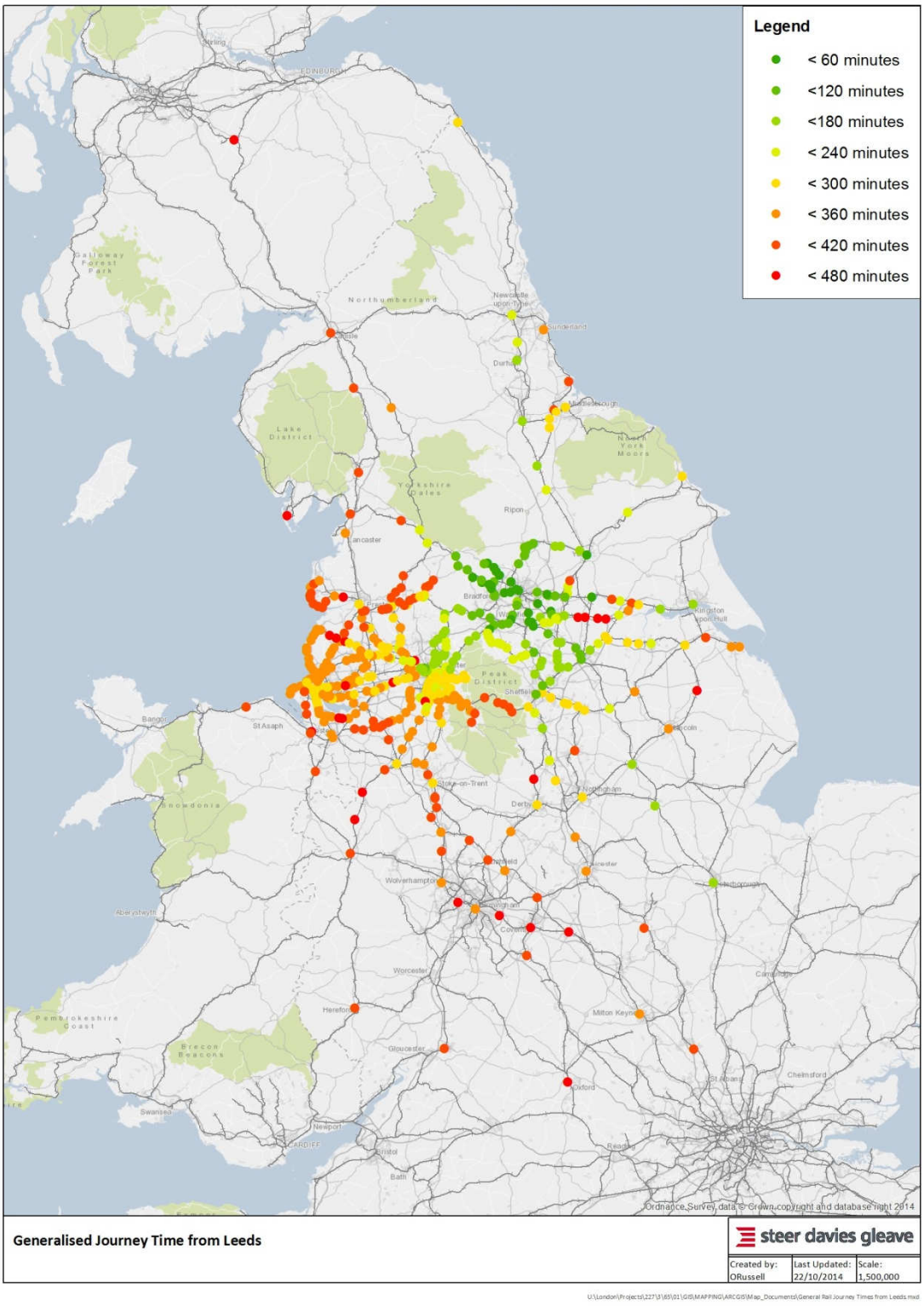
[37] 5 or 6 direct trains per hour or services that involve a simple interchange

Figure 3.3: Generalised journey times to/from Manchester (commuting trips)



Data source: HS2 Ltd PLANET Framework Model – PLANET North (2036 'without scheme' case)

Figure 3.4: Generalised journey times to/from Leeds (commuting trips)



Data source: HS2 Ltd PLANET Framework Model – PLANET North (2036 'without scheme' case)

3.26 It should be noted that not every station on the rail network is represented in the figures. This is a feature of the HS2 Ltd modelling suite whereby the geographic resolution of the network is reduced outside the core study area. This reduces the complexity involved and has knock-on effects on the amount of time required to set up, run and interpret model runs.

3.27 Inter-regional trains within the North are highly utilised. Data published by the ORR shows that First Trans Pennine Express has the highest number of passengers per seat than any other rail franchise than London Overground[38] (the trains for which have relatively few seats and are designed for a high percentage of passengers to stand). This data shows that Trans Pennine's seat utilisation is higher than any TOC operating in London and the South East and any inter-city TOC. This is manifested as on-train crowding with many trains experiencing large numbers of passengers standing for long distances. As set out in Rail North's Long Term Rail Strategy, this occurs in inter-peak periods and at weekends, as well as in the commuting peaks.

3.28 The introduction of electric stock to the Manchester Airport – Scotland services in 2014 following the completion of the early phases of the North West electrification has also allowed some strengthening of services. In May 2014 additional capacity was provided on the North Trans Pennine route with the introduction of a fifth Trans Pennine Express service per standard hour linking Newcastle with Liverpool via Leeds and Manchester Victoria. Implementation of the Northern Hub will allow a further frequency increase. Trans Pennine electrification will allow the introduction of four-car electric units replacing what are currently three-car diesel trains on some services. Together these enhancements will increase capacity which will contribute to alleviating current overcrowding. However, as we set out below further growth in demand is anticipated on the trans-Pennine routes.

3.29 Other longer distance operators also in the North also experience on-train crowding and like First Trans Pennine Express, this is not limited to peak periods. This is particularly true for Cross Country services, and East Midlands Trains services on the Liverpool – Manchester – Sheffield route[39].

3.30 Performance on Trans Pennine's routes is below the national average. Table 3.7 sets out the latest PPM statistics for the Trans Pennine franchise. It is understood that the East Midlands Trains service between Liverpool, Manchester and Sheffield and Cross Country services in the North also performs below par in relation to PPM.

[38] See Figure 26, *Costs and Revenues of Franchised Passenger Train Operators in the UK*, ORR, November 2012

[39] Train loadings on individual services are considered commercially confidential and other than at the most aggregate levels it is not possible to identify which services regularly experience on-train crowding.

Table 3.7: First Trans Pennine – Performance (PPM for 2014-15, Period 6)

	Public Performance Measure (PPM)		Right Time (RT)	
	Period	MAA	Period	MAA
North Trans-Pennine	89.4%	87.7%	45.5%	50.2%
North West Trans-Pennine	93.2%	90.8%	57.1%	56.7%
South Trans-Pennine	91.4%	91.3%	70.5%	68.4%
National Average	**92.1%**	**89.5%**	**69.0%**	**65.1%**

Data source: Network Rail (PPM combines figures for punctuality and reliability into a single performance measure. It is the industry standard measurement of performance. Right-time performance measures the percentage of trains arriving at their terminating station early or within 59 seconds of schedule)

3.31 Only a minority of longer distance trips using the North's rail network are genuinely city centre to city centre (i.e. have a walk access journey to and from the city centre stations at either end of the journey)[40]. Most will have at least one access leg made using the local road network as a driver, a passenger or in a taxi, or by using feeder rail, metro/light rail or bus. While transport networks within city regions is the subject of the next Chapter, here it is noted that these local road and public transport networks are an integral part of the North's city region to city region networks, and so constraints and opportunities associated with these networks affect longer distance travel too.

3.32 The West Coast Main Line is the principal north-south route for rail freight being electrified and gauge-cleared for the latest generation of inter-modal containers. There are significant flows on the East Coast Main Line, but this is not yet fully gauge-cleared. As we discuss further in Chapter 5, the North's port are generators of rail freight and there are other regionally-important rail freight generators across the North.

3.33 The North's longer distance rail network is experiencing some significant investment in this current control period, CP5 (2014-2019). This includes the Northern Hub package that will reduce journey times and allow for a further increase in frequency on trans-Pennine routes, as well as allowing for new movements to be made across Manchester by connecting Victoria and Piccadilly stations via a short section of new railway (the Ordsall Chord). Electrification in the North West between Manchester and Liverpool, Manchester and Preston, Liverpool and Preston and to Blackpool will also support faster journey times and enhanced frequencies both for longer distance movements and for commuter journeys, as will trans-Pennine electrification between Manchester, Leeds and York/Selby. Together this will allow a further frequency increase to six services per hour between Leeds and Manchester, of which four will be fast and two will be semi-fast, as well as frequency increases between Manchester and Sheffield. The North will benefit from the nation-wide implementation of the Strategic Freight Network and electrification can deliver gauge-clearance to W10 standard.

3.34 Each of these investments will deliver worthwhile economic benefits to the North and contribute to enhanced city to city connectivity, as well as improving local journey to work networks and connectivity to Manchester Airport. There will be additional benefits to freight

[40] See for example the findings of origin destination surveys undertaken at Leeds City Station in 2008

through the provision of additional paths and the gauge-clearance that is associated with electrification.

- Within the North, the longer distance rail network is currently slow when compared with the car alternative, has a low frequency service and has inadequate capacity for current demand.
- Despite this rail passenger numbers have been growing over recent years, so on-train crowding has been worsening.
- Longer distance rail services in the North have a poor performance against timetable in terms of reliability.
- Most city to city journeys have at least one feeder journey and these use city region networks.

Looking Ahead

3.35 The previous sections have set out the transport constraints the North's city to city networks face at present. Here we consider its future prospects.

Strategic Road Network

3.36 The DfT projects that road traffic on the Strategic Road Network is forecast to return to growth with the recovery of the economy. It projects that national road traffic (that is vehicle-kilometres) by 2040 will be 46% higher than in 2010, implying an increase in congestion (measured as lost time) of about 114%[41].

3.37 Looking at the North, Table 3.8 sets out the DfT's projections of traffic growth on the North's motorways. These figures are for all traffic – light goods vehicle traffic is forecast to grow faster than this rate, while heavy goods vehicle traffic is forecast to grow at a slower rate.

Table 3.8: All Traffic Growth – North's Interurban Network

Region	All Traffic Growth - 2010 to 2040
North East	+37.0%
North West	+40.8%
Yorkshire & the Humber	+46.2%

Data Source: DfT Road Traffic Forecasts 2013

3.38 Shown in Figure 3.5 and Figure 3.6 are the DfT's assessment of current (2010) and future (2040) conditions on the Strategic Road Network. These have been produced using outputs from the DfT's National Transport Model. These show that even with committed investments, traffic growth is projected to be such that traffic speeds on the Strategic Road Network will fall and delays will increase[42]. A greater extent of the Strategic Road Network will experience

[41] DfT (2013) *Road Transport Forecasts 2013: Results from the Department for Transport's National Transport Model*

[42] As set out in *Road Transport Forecasts 2013* (DfT) "committed investment" includes the addition of around 400 lane miles of capacity to the existing network by 2020 based on the *Spending Review 2010*

congestion than now. Problems with weather-related resilience on the trans-Pennine route will remain.

3.39 Opportunities to mitigate these impacts are limited. There appears no appetite for the construction of new motorways. More extensive application of Managed Motorways would provide some relief, but this will not provide any solution for those sections of the network that have already been subject to Managed Motorway treatment. Road user charging is not considered politically acceptable at the current time. While in the long term, new technology (e.g. vehicle platooning) may offer opportunities to get more from the existing network, there is at present no prospect for the application of such solutions to the Strategic Road Network. For the foreseeable future, increasing congestion and its economic consequences will persist.

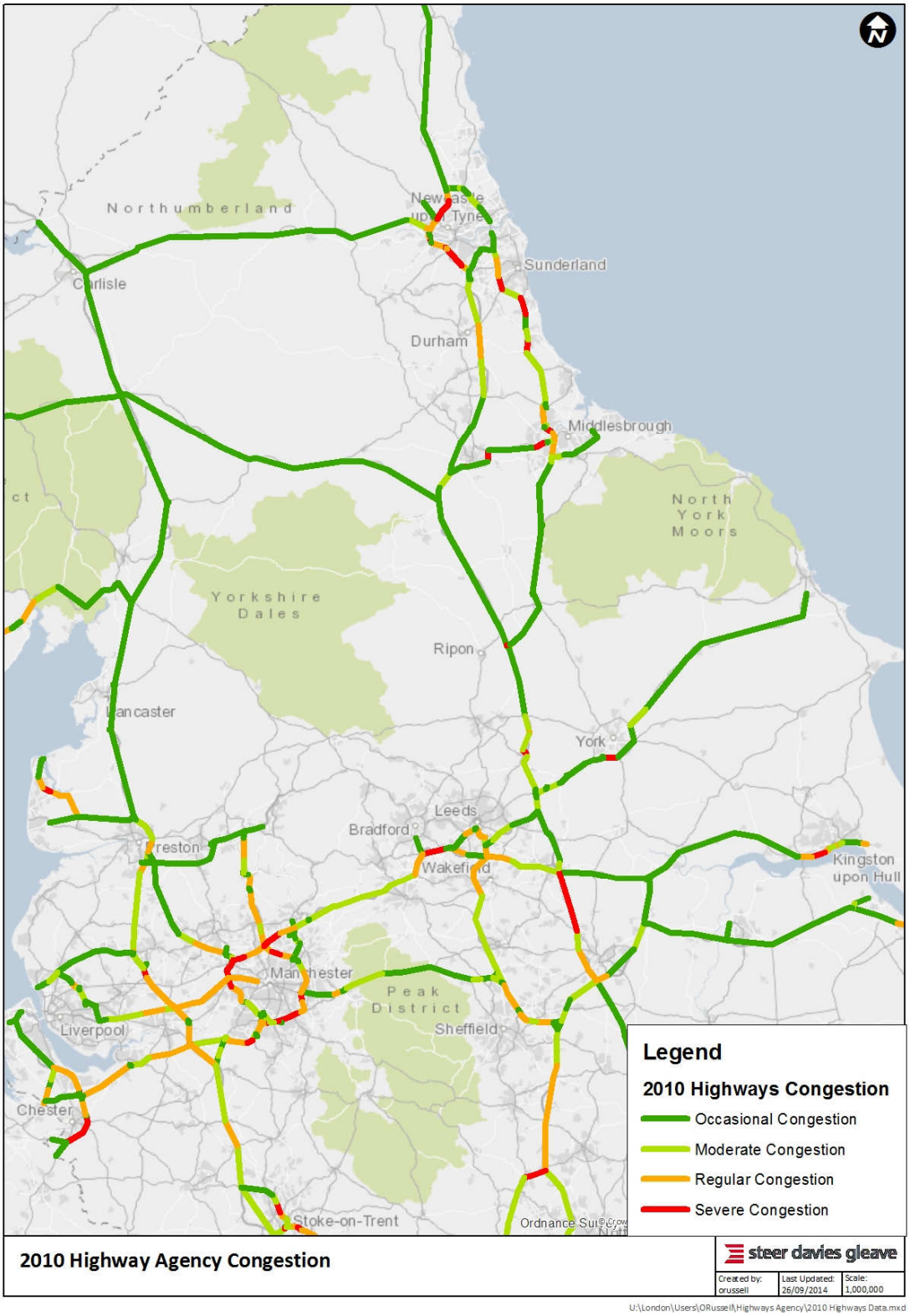
3.40 During the engagement undertaken as part of this work, stakeholders from across the North welcomed the Highways Agency's move as part of its reform programme to a longer term planning framework, and in particular the commitment to develop a Roads Investment Strategy[43]. However, as well as having a five year programme, stakeholders stressed the importance of setting the five year investment plan in the context of a genuine long term strategy looking over a 15 to 20 year period. They also stressed the importance of both the investment plan and strategy being developed in consultation with city region authorities so it supports and complements the local land use and transport planning frameworks.

3.41 Enhanced rail connectivity between the North's city regions would provide an alternative way of travel for some of the journeys that would otherwise use the Strategic Road Network and, in particular, those trips between the centres of the North's Core Cities. While the very different rail and road mode share for journeys between city regions means that modal shift may not have an appreciable impact on highway congestion in isolation, combined with land-use policies which facilitate more development around public transport hubs, the impact on city-centre journeys could be material.

(SR 2010), *Growth Review 2014* and the announcement in May 2012 of six schemes designed to ensure the maintenance of a "pipeline" of future Highways Agency projects

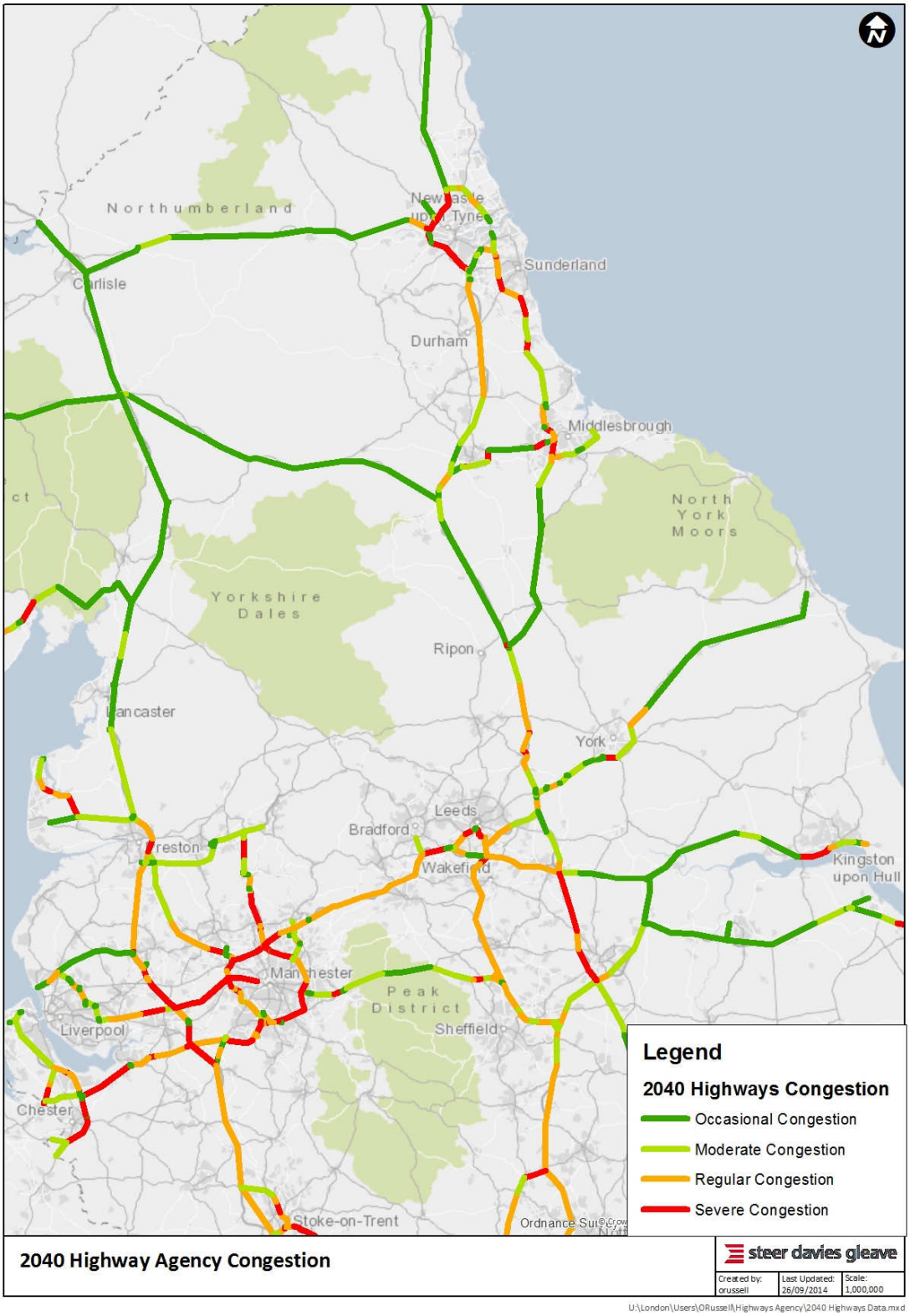
[43] DfT (2014) *Setting the Road Investment Strategy Now and in the Future*

Figure 3.5: Strategic Road Network – Current Conditions (2010)



Data source: DfT National Transport Model (DfT Traffic Forecasts 2013)

Figure 3.6: Strategic Road Network – Future Conditions (2040)



Data source: DfT National Transport Model (DfT Traffic Forecasts 2013)

Rail

3.42 Rail demand is forecast to continue to grow. Network Rail's Long Distance Market Study has produced four growth scenarios for peak rail demand. For travel between the Core Cities in the North the two scenarios with the lowest and highest forecasts of growth are summarised in Table 3.9 below.

Table 3.9: Network Rail Growth Scenarios – Peak Growth to 2042-43

	Lowest growth scenario	Highest growth scenario
Liverpool - Leeds	+31%	+89%
Manchester - Leeds	+33%	+103%
Manchester - Liverpool	+28%	+92%
Newcastle - Leeds	+17%	+62%
Newcastle – Liverpool	+13%	+94%
Newcastle - Manchester	+30%	+109%
Sheffield – Leeds	+27%	+94%
Sheffield – Liverpool	+31%	+103%
Sheffield – Manchester	+30%	+98%
Sheffield – Newcastle	+12%	+95%

Data Source: Figure 6.6, Network Rail (2013) Long Term Planning Process: Long Distance Market Study

3.43 While the scenarios produced by Network Rail are deliberately broad and are not intended to represent a central case forecast comparable to those used for businesses cases for rail infrastructure investment, Network Rail uses the highest growth scenario to inform its longer term network planning while looking at the sensitivity of the case for its proposals to alternative growth scenarios.

3.44 HS2 Ltd has developed its own forecasts of the growth in rail demand in the North. These forecasts for growth in demand between the three regions in the North and London, which have been produced using the Planet Framework Model are summarised in Table 3.10.

Table 3.10: HS2 Ltd Rail Demand Projections (2010 to 2036 'without scheme' case)

From ↓ : To →	North East	North West	Yorkshire and Humber	London
North East	49%	60%	57%	83%
North West	61%	71%	65%	85%
Yorkshire and Humber	58%	66%	73%	75%
London	80%	82%	73%	n/a

Data source: HS2 Ltd PLANET Framework Model v4.3 (October 2013 Economic Case)

3.45 These projections utilise the DfT's National Trip End Model (NTEM) projections on future district level population and employment. While these projections are considered by many local and regional bodies to offer a conservative view of the future, they still suggest that the five northern city regions will need to accommodate a significantly larger quantity of households and jobs than at present.

3.46 In contrast to the growth in jobs and population suggested by the National Trip End Model, each of the SEPs for the North's five Core City city regions is predicated on delivering employment growth in excess of the DfT's projections and, should they be successful, this would suggest growth over and above the HS2 Ltd central position.

3.47 Even with the committed enhancements outlined earlier in this Chapter, there is widespread acceptance[44] that the long distance rail network in the North does not have sufficient capacity to cater for this growth. To do so will require both longer trains and, on some routes, more frequent services.

3.48 On top of this there are substantial benefits to be had from reducing the journey times between northern cities. For example, work for the Northern Way[45] found that a 20 minute improvement in rail journey time on the trans-Pennine corridor between Leeds and Manchester would result in a GVA uplift of £6.7bn across the North of which just £2.7bn is captured in the two city regions.

3.49 Overall, there appears a *prima facie* case for additional investment in track capacity, station capacity and rolling stock, as well as investment to reduce journey times.

3.50 HS2 will lead to a transformational change for many cities in the North through their connectivity to London and the Midlands by reducing journey times and providing additional passenger capacity. The scale of HS2's impacts and the benefits that they will bring has been covered elsewhere[46] and so is not repeated here.

3.51 As well as connectivity from the Core Cities to London, the current inter-city services operated on the East and West Coast Main Lines and the Midland Main Line provide opportunity for improved connectivity for the Core Cities to a range of other destinations (e.g. Leeds to Peterborough, Manchester to Milton Keynes, Newcastle – Edinburgh) and between other towns and cities with London (e.g. Doncaster to London, Runcorn to London). There is a strong aspiration across the North to maintain this existing connectivity post HS2.

Exploiting Opportunities

3.52 Enhancing rail travel between the North's city regions, between the North and London, and between the North and city regions across the country will support the North's city regions to exploit their comparative advantages and so secure economic growth.

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[44] See Network Rail (2013) *Long Term Planning Process: Long Distance Market Study*; Rail North (2014) *Long Term Rail Strategy*; One North (2014) *A Proposition for an Interconnected North*

[45] SERC (2009) *Strengthening Economic Linkages between Leeds and Manchester: Feasibility and Implications* (November 2009)

[46] See for example DfT (2013) *The Strategic Case for HS2*

3.53 It will do this by:

- Facilitating greater business to business interaction;
- Extending labour markets;
- Supporting cities' retail, leisure and visitor economies; and
- Providing an alternative to what will be a more congested Strategic Road Network

3.54 As set out in Chapter 2, improving the transport links between areas of economic mass has the potential to contribute to the attraction and retention of skilled workers, higher individual prosperity, the reduction of deprivation and delivering economic growth. But at the same time better transport links will also increase the competitive pressures felt by businesses in those areas where the costs of doing business have fallen. In order to overcome the two-way road effect, and as set out in Chapter 2, if individual city regions are specialised and can exploit their comparative advantage over a broader market, the impact of increased competitive pressures can lead to gains in productivity which will exceed the impact of increased competitive pressures.

3.55 Two further factors need to be considered when thinking about the two-way road effect. First, while appraisal methods tend to consider scenarios with or without a specific intervention, they tend not to include complementary or supporting interventions that may mitigate any detrimental impacts. Second, conclusions regarding winners and losers will differ according to the focus of attention, e.g. on where output is produced (and income generated) or where the income from output is spent. Furthermore, even if greater efficiency leads to job relocation, the impacts are likely to be transitory, particularly where a successful wider portfolio of interventions to support a Northern Powerhouse has been deployed.

3.56 HS2 will:

- Improve connectivity to London, which given its World City economic functions and its role as the seat of government is seen as essential to support the further growth of a service-focussed northern economy.
- Improve connectivity between the North and the Midlands as well as for some movements within the North. This is important for business to business connectivity, journey to work trips and leisure journeys

3.57 There will, however, remain a further need to enhance rail connectivity in the North if its full economic potential is to be met[47]. In particular:

- Further benefits to be had from enhancing east-west connectivity across the Pennines to improve the links between Liverpool, Manchester, Sheffield and Leeds
- Benefits from enhancing connectivity between Leeds/York and Newcastle, which in conjunction with trans-Pennine enhancements will improve connectivity between the North West and North East

[47] For example, see Northern Way Transport Compact *The Economic Case for Transport Investment in the North* (2011), Overman et al. *Strengthening Economic Linkages Between Leeds and Manchester: Feasibility and Implications* (2009), Rail North (2014), *Long Term Rail Strategy*.

3.58 Journeys tend not to be just from city centre to city centre. Onward connectivity is important and this is provided by the local Journey to Work networks in each city region. While this is the subject of the next Chapter, it is noted here that enhancements to the connectivity of these local networks would be necessary to maximise the benefits that further enhancements to inter-city connectivity in the North would deliver as well as the benefits that HS2 will bring. The specialisation and economies of scale which arise from increasing the size of markets can only be delivered if there is access to the right skills and intermediate inputs which requires a well-functioning intra-regional transport system.

4 Improving the Journey to Work

Summary

- Deepening labour markets (i.e. extending Journey to Work catchments) will support economic growth
- Employment in centres of Core Cities is projected to continue to grow
- There are also key employment clusters elsewhere in city regions – town centres/development nodes – and these have transport needs that have to be addressed if they are to grow to their full potential
- In peak periods, radial road networks to the centres of the Core Cities are operating at capacity. There is a limited supply of city centre car parking. There are tangible constraints on growth in peak period car traffic to the centres of the northern Core Cities.
- The most sustainable way forward for the centres of the Core Cities is to grow public transport mode share of:
  - Journey to work trips
  - Trips for other purposes
- The networks that access the centres of the Core Cities are also those that will be used to access HS2 stations. This is the case for city centre stations and for the proposed hub stations, each of which will be located on a key radial route
- A strong city centre focussed public transport network is the foundation for a strong city region wide public transport network.
- But
  - Bus demand is in long term decline and continued decline is a tangible threat to a city's ambitions to grow their city centres sustainably
  - While rapid transit plays an important role geographic scope and capacity is limited
  - Rail demand has grown substantially over the last two decades and has supported the economic growth of city centres, but now across the North there are track and train capacity constraints, plus increasing constraints associated with stations and access. Many rail services across the North are perceived as poor quality
- There is a need for new and enhanced cross-city public transport links

Introduction

4.1 Recent years have seen the economic importance of cities grow and all indications are that this trend will continue. They account for 54% of the population, 59% of jobs and produce 61% of national output[48].

4.2 In particular, the centres of Britain's Core Cities have experienced employment growth, notably in the Knowledge Intensive Business Sector (KIBS), such as in finance, law and accounting. According to Centre for Cities (2014), between 2003 and 2008 this sector accounted for one in every two private sector jobs created and 73% of jobs in this sector are located in cities. Jobs in this sector tend to be some of the highest paid and highest skilled. As shown by Graham (2007) and reflected in DfT's appraisal guidance[49], as a sector that benefits from proximity to clients, collaborators and its customers, KIBS benefit from agglomeration.

4.3 While important both now and in the future, it would be wrong, however, to simply focus on the service sector. Each of the North's Core Cities and their surrounding city regions is home to manufacturing clusters of national economic importance. Table 4.1 is not exhaustive but is intended to provide an indication of some of the manufacturing clusters present in each city region. The Strategic Economic Plans for these cities each set out the importance of supporting growth in these and other sectors. While some of these sectors are located in the centres of the Core Cities, because of their particular land use and other requirements many are not. These sectors can have particular transport needs to access labour, as well as transport input commodities, components and finished good. In addition to the centres of the core cities within the wider city regions there are city, town and district centres that are a focus for the retail, service and public sectors.

Table 4.1: Economic Clusters in the City Regions

City Region	Specialist Industry	Share of the England and Wales employees in the industry	Share of the total England and Wales Working population
Greater Manchester	Textile Manufacturing	14.1%	4.7%
Merseyside	Pharmaceutical Manufacturing	6.4%	2.4%
South Yorkshire	Metal Manufacturing	10.7%	2.1%
Tyne and Wear	Motor Vehicle Manufacturing	8.1%	2.0%
West Yorkshire	Textile Manufacturing	18.1%	3.9%

Data source: Business Register and Employment Survey (BRES) 2012. Merseyside includes Halton

4.4 As we set out in Chapter 2, deepening labour markets (that is extending a city's journey to work catchments) will support economic growth. This applies not just to KIBS that have experienced strong growth and are forecast to grow in the future, it applies to other sectors too.

[48] Centre for Cities (2014) *Where are the Priority Linkages for Transport Investment to Maximise Economic Growth in the North?*

[49] DfT (2014) TAG Unit A2.1 Wider Impacts

4.5 Within the Core Cities, city regions' transport networks are focussed on their city centres. Each city centre is a hub of its city region's road and bus networks and, in particular, for rail and light rail/metro services.

4.6 As well as providing access to the jobs and services located in and around the centres of the Core Cities, it is these local networks that will enable access to the proposed HS2 city centre stations and provide public transport access to HS2's hub stations in the North[50].

The connectivity available for journeys to work is inextricably linked to the connectivity of the HS2 network.

4.7 Other town and cities within city regions also have their own radially focussed road and bus networks and while rail and light rail/metro tend to be focussed on the centres of the Core Cities, these can also be important access modes to some of the secondary centres. On top of this, out-of-town centre retail and employment locations are important trip generators in their own right. City regions are characterised by a complex and overlaying pattern of trip movements. To focus simply on radial trips to the centres of the core cities would mean that key transport constraints that affect city regions' economic future are not fully considered.

Travel Within City Regions

4.8 As can be seen from Table 4.2 private car dominates motorised personal travel in England's city regions (excluding London), accounting for four fifths of all trip making. Bus is the most utilised public transport mode, accounting for twice as many trips as rail and light rail/metro combined.

Table 4.2: Mode Share – Major Conurbations (excluding London)

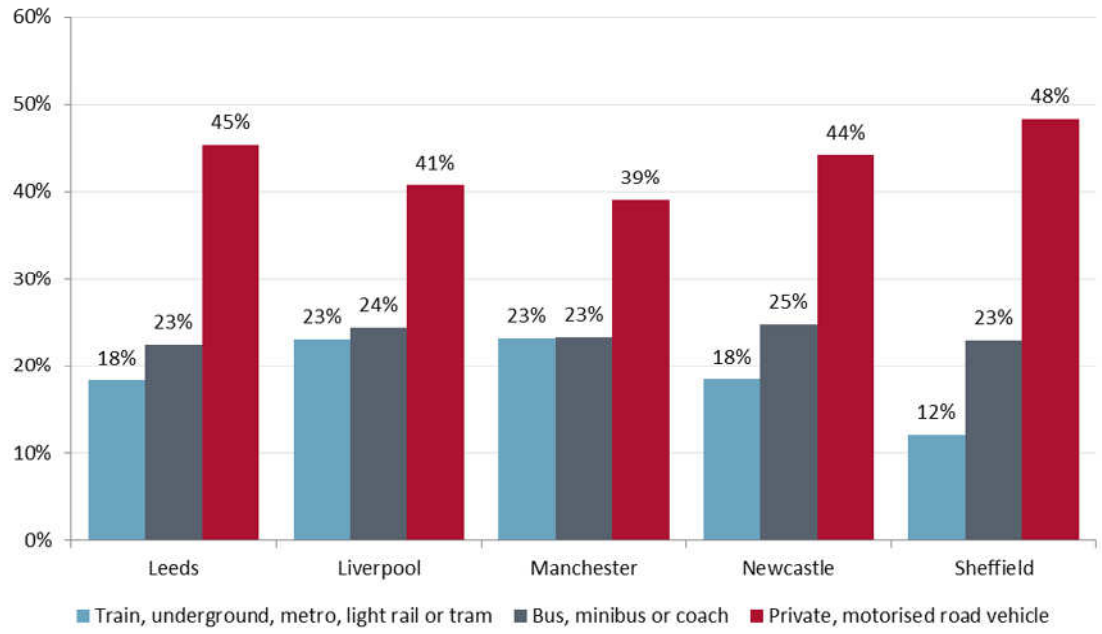
Main Mode of Transport	% of all trips
Car/van (driver and passenger)	83.6%
Bus	10.7%
Other public transport (rail, light rail, metro)	5.7%

Data source: National Travel Survey 2013 Table NTS 9903 (note excludes walk/cycling. Major Conurbation includes West Midlands)

4.9 Focusing on total trip making at a conurbation-wide level can, however, lead to an understatement of the economic importance of public transport. Figure 4.1 presents analysis of the 2011 Census Journey to Work (JTW) data. This shows that public transport mode share and in particular rail's mode share for journeys to work to the heart of Core Cities (that is the locations that have the greatest concentrations of employment) is even greater than for the conurbations as a whole.

[50] See for example MVA (2013) *Options for Phase 2 of the High Speed Rail Network – Demand and Appraisal Report* that sets out the modelled scale and extent of public transport feeders to the proposed high speed rail network

Figure 4.1: Overall Mode Share for Journeys to Work (from England and Wales to City Centres)



Data source: 2011 Census Travel to Work Data, Steer Davies Gleave analysis. Note Census data is for main mode of travel to work. Feeder modes are not identified in the data

4.10 Trips by different modes are also characterised by different trip lengths. Trips by bus are typically the shortest trips made by mechanised modes and trips by rail are the longest, as shown by Table 4.3.

Table 4.3: Average Trip Length – Major Conurbations

Mode	Average Trip Length (miles)
Car/van (driver)	7.2
Car/van (passenger)	7.3
Local bus	4.0
Other public transport (rail, light rail, metro)	15.0

Data source: National Travel Survey 2013 Table NTS 9903 (note Major Conurbation includes London and West Midlands)

4.11 As we set out later in this Chapter, one of the challenges to be addressed if bus demand is to grow is to make it more attractive for longer journeys. In addition as city centres grow in their physical extent bus feeders to stations have the potential to become a more important mode.

4.12 While this section has focussed on motorised modes within the city regions, walking and cycling are also important modes for shorter distance trips. The National Travel Survey indicates that in major conurbations walking trips account for around a quarter of all trips[51].

[51] See NTS Table 9903

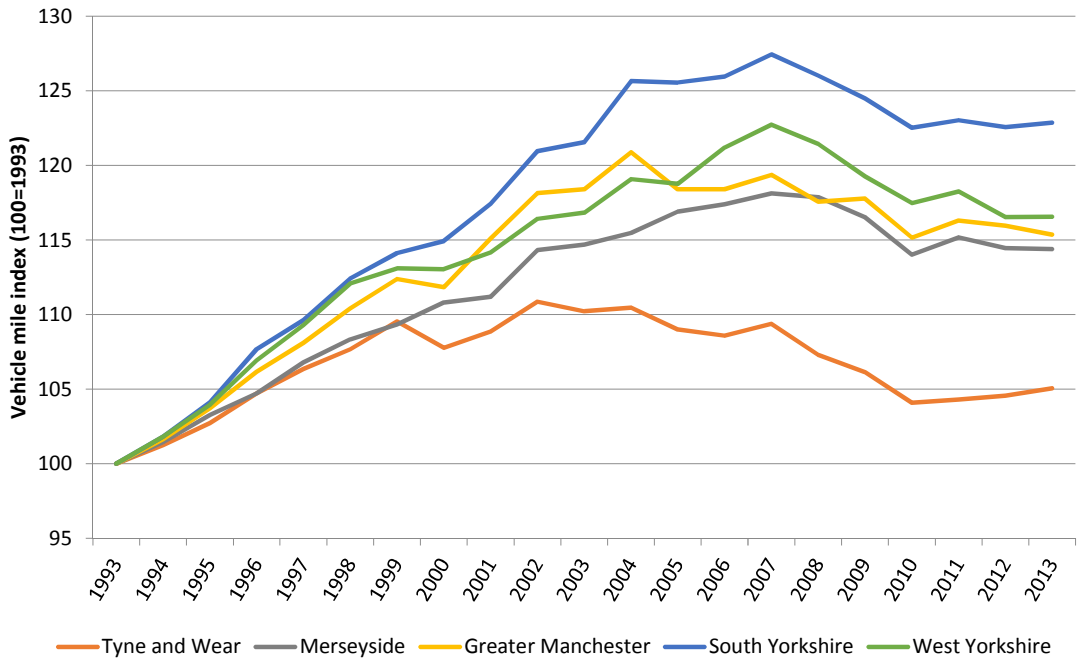
Reflecting the fact that the majority of trips are within city region commuting, walking tends to be the main mode of access to and from Core City terminal rail stations[52].

- Private car is the most utilised travel mode in the major conurbations
- Bus is the most utilised public transport mode catering for twice as many trips as rail and light rail/metro combined. However, the average bus trip distance is just 4 miles
- Rail and metro/light rail caters for about 6% of all trips in the major conurbations (excluding London), but these trips are longer than trips by bus or car, so collectively rail's share of total travel is much higher at around 12%
- Public transport's share of trips into city centres is much higher than conurbation-wide data might suggest
- Rail mode share is particularly high for longer distance journeys to work into city centres

Trip making by road

4.13 In the fifteen years between 1993 and 2008 traffic in each of the North's city regions grew (see Figure 4.2). The growth in traffic is due to a combination of more trips being made by car and longer average trip length.

Figure 4.2: Indexed Plot of Traffic (vehicle miles) in Five Northern Metropolitan Areas 1993 – 2013



Data source: Department for Transport, motor vehicle traffic (vehicle miles) by local authority in Great Britain

4.14 Since 2008, total traffic volumes have declined. This is likely to be due to a combination of effects: the economic downturn, a period of high fuel prices and changes to the car insurance

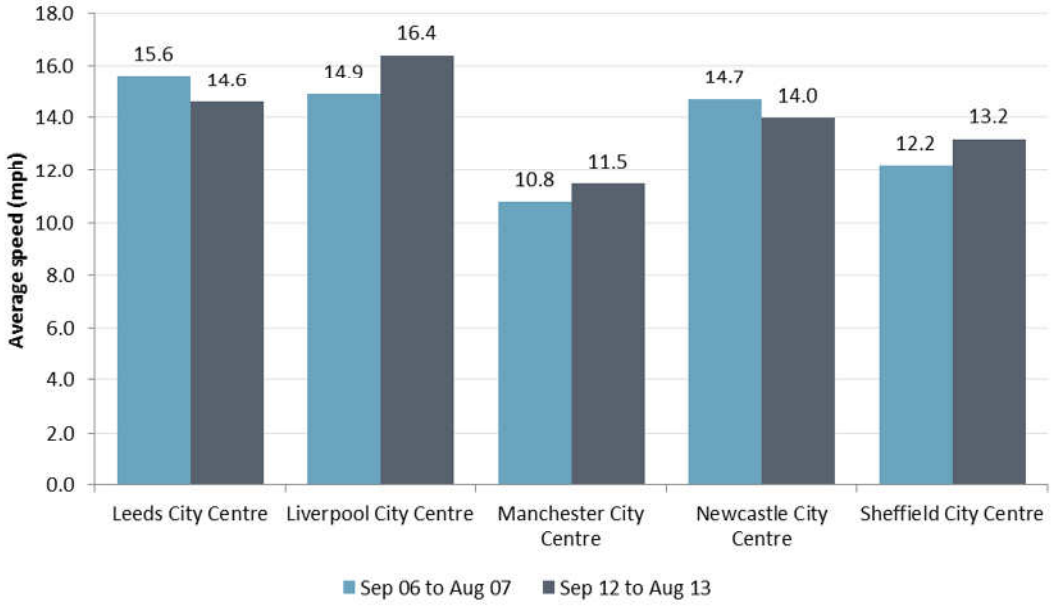
[52] For example, a 2008 survey of arriving passengers at Leeds City Station showed that three-quarters of surveyed passengers walked from the station to their ultimate destination

market that have increased the cost of insurance to newly qualified (typically younger) drivers[53].

4.15 Traffic conditions vary by time of day and by location across the northern conurbations. Each of the five Core City city regions experience traffic congestion, with the view being that at peak times parts of the networks, notably those focussed on the centres of the Core Cities are operating at or beyond capacity. This provides a material constraint on growth in trip making by car to these city centres.

4.16 Figure 4.3 shows that city centre journeys in the morning peak period are slow, with current average speeds of between 11.5 and 16.4 miles per hour. While there is a mixed picture regarding the change in average speed through time, year-to-year variation may be caused by a multitude of factors including traffic volumes, road conditions, localised traffic interventions (e.g. new traffic light systems or speed limit changes), structural changes to the road, driver behaviour, weather conditions, and the impact of the recession.

Figure 4.3: Average flow-weighted weekday morning peak period speeds on local 'A' roads



Data source: Department for Transport Congestion Statistics, Steer Davies Gleave analysis

4.17 Congestion is not limited to the radial routes focussed on the centres of the Core Cities, but also radial networks concentrated on other towns and cities. Orbital networks experience congestion, notably at the intersection with radials and at junctions with the Strategic Road Network. Each of the Core City conurbations has a number of pinch points that are congestion hot spots.

[53] The 1995/97 National Travel Survey indicated that 51% of those in the 17-20 age bracket in England had a driving licence. By 2013 this had fallen to 30%. For the 21-29 age bracket licence holding fell from 81% to 67% in the same period. See NTS Table 0201

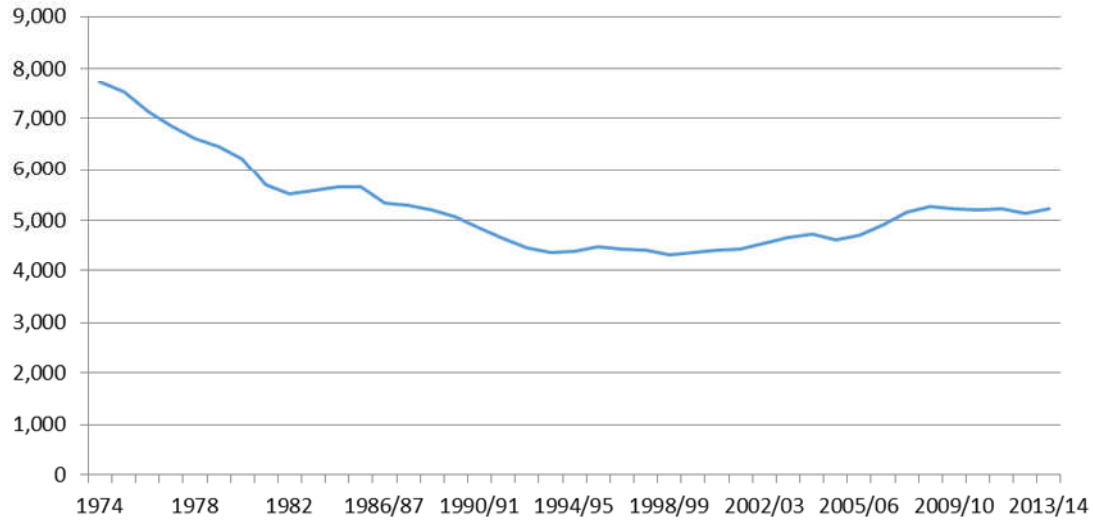
4.18 In addition to congestion being a tangible constraint on peak hour traffic, car parking availability is a further constraint. The centres of the Core Cities have a limited supply of parking supply and typically have policies limiting the development of further capacity[54].

- Car travel in the North's metropolitan areas grew in the 15 years to 2008, but since then there has been no growth overall
- In peak times, car trip making to/from the centres of the Core Cities has been constrained by network capacity. Car parking availability is a further constraint.
- Cities across the North experience congestion – this is not limited to radial routes

Trip making by bus

4.19 Bus patronage in England and Wales has been in long term decline (see Figure 4.4). This trend pre-dates deregulation in 1986. However, over the past decade or so there has been an upswing in national figures, driven largely by the London bus market.

Figure 4.4: Local Bus Patronage (million local bus journeys): 1974 to 2013-14



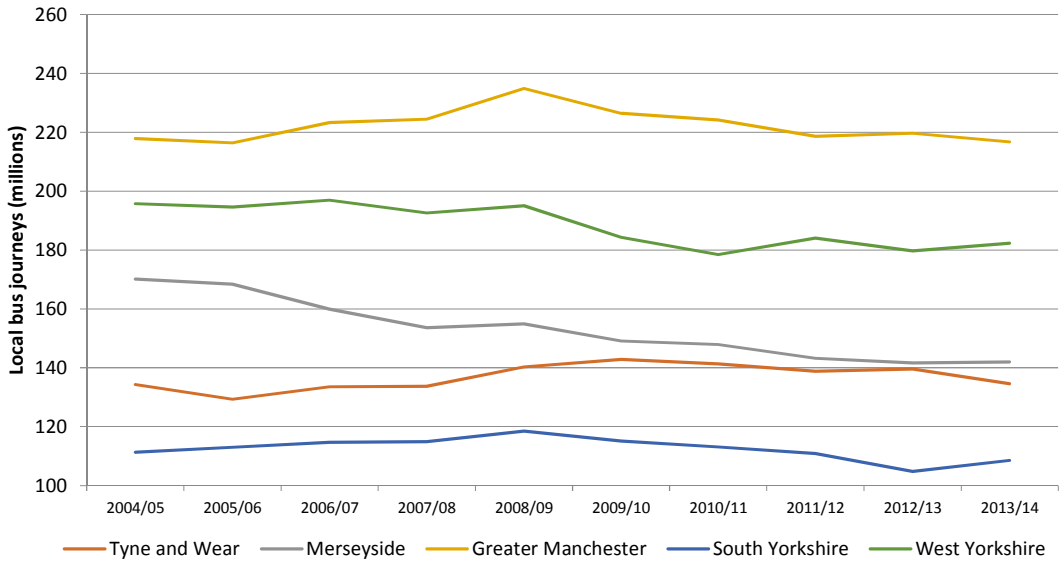
Data source: Department for Transport Bus Statistics: Table BUS0101

4.20 In 2012/13, 725 million journeys were made by bus in the North's five metropolitan areas[55]. As shown in Figure 4.5 metropolitan areas in the North have not experienced the same upswing in bus patronage that has occurred in London in the last decade. Following an increase in bus patronage after the introduction of the English National Concessionary Travel Scheme, the recession has led to a resumption of the overall pattern of decline. As with elsewhere outside London, bus services in the five Northern city regions are deregulated and are predominantly provided on a commercial basis. This means operators are responsible for determining routes and timetables, and setting fares.

[54] This does not mean that new car parks will not be built, rather that the goal is for net supply to increase

[55] Data Source: DfT Table BUS0109a

Figure 4.5: Bus Patronage (million local bus journeys originating in city regions): Metropolitan Areas 2004-05 to 2013-14



Data source: Department for Transport Bus Statistics: Table BUS0109b

4.21 The reasons for the long-term decline in local bus patronage are a combination of inter-related factors. These include:

- socio-economic changes in the population, for example increased car ownership and driving licence holding amongst socio-economic groups that traditionally have made up the core of the bus market, i.e. working age women and the retired;
- changes in the patterns of activity with the dispersal of retail and employment activity away from traditional city and town centres along with increasing distances between home and school (and the greater number of parents/guardian accompanying their children to school); and finally,
- the attractiveness of the bus offer vis-à-vis alternatives, particularly the private car.

4.22 With regard to the last of these factors, amongst non-users bus is seen as a mode of last resort. According to DfT research 66% of non-users and 50% of bus users agreed that they would only travel by bus if there was 'no other way of getting there'[56]. Research undertaken to support business cases for rapid transit proposals in the North identifies that amongst non-users buses are seen as slow when compared with alternatives, unreliable (scheduled buses don't run), unpunctual (buses don't adhere to schedule) and of overall poor quality. Despite perceptions, across the North there are some notable exceptions where in partnership between the public and private sector bus services have been enhanced and there has been patronage growth.

[56] DfT (2013) *Public Attitude Towards Buses*

4.23 Using National Travel Survey data, Mackie, Laird and Johnson (2012) set out the socio-demographic characteristics of frequent bus users (with frequent bus use defined as at least once a week)[57]:

- 30% of people are frequent bus users – a quarter of men and a third of women. Half of men never use the bus and a third of women never do so
- Over half of 16-19 year olds and over a third of 20-29 year olds are frequent bus users; this drops to a fifth for 40-60 year olds
- Around 20% of full time employed, 30% of part time employed and over 50% of students aged over 16 are frequent bus users
- Among those in employment, frequent bus use is most common amongst the lower skilled occupations, namely manual workers and occupations such as sales, customer service and personal services
- 70% of those with no car available use the bus frequently compared with 20% of those with car available

4.24 From this, it can be seen that bus serves a vital function catering for those with lower incomes, students and in particular those who do not have access to a car.

- While in terms of passenger numbers the most important public transport mode in the North's metropolitan areas, bus demand has been in long term decline
- Bus serves a vital social function catering for those with lower incomes, students and in particular those who do not have access to a car
- Bus services are seen by non-users as slow, unpunctual, unreliable and of low quality

Trip making by rail

4.25 In 2012/13, 115 million journeys were made using the North's two principal rail franchises, Northern Rail and First Trans Pennine Express[58]. A further 42 million journeys were made on the Merseyrail Electrics network[59]. Journeys within the North are also made using services provided by Arriva Trains Wales, Cross Country, East Coast, East Midlands Trains and Virgin West Coast, as well as a number of open access operators. In addition to catering for longer distance trips, each of these operators form an integral part of city region rail networks. In total, stations in the North catered for 161m passengers during 2012-13[60].

4.26 Trip making by rail has grown strongly in the last two decades. During 2013/14, almost 1.6 billion trips were made nationally by rail, approximately twice the number made in 1994/95. While there is no time series data over a similar period for rail trip making in the North, the Office of Rail Regulation records the number of trips made by 'Franchised Regional Operators' i.e. excluding London and the South East and Long Distance operators. Between 1994/95 and 2013/14, trip making on Franchised Regional Operators grew by 96% which is broadly similar to the overall national trend.

[57] Mackie P, Laird J, Johnson D (2012) *Buses and Economic Growth*, ITS, Leeds

[58] See ORR National Rail Trends

[59] See ORR National Rail Trends

[60] See ORR National Rail Trends

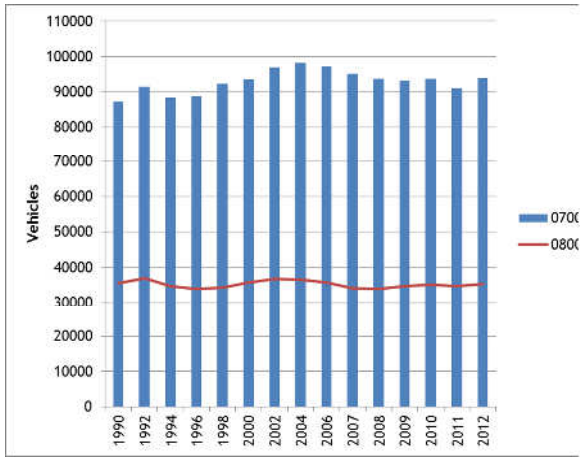
Car Trips to the Centre of Leeds – A Case Study

Data is available from annual cordon counts around Leeds City Centre undertaken by Leeds City Council. This shows that between 1990 and 2012 there has been no marked change in the volume of AM peak period hour (08:00 to 09:00) traffic. In the AM peak period (07:00 to 10:00), there was a period of growth of inbound traffic between 1990 and 2006 whilst between 2006 and 2011 there has been a modest decline in inbound traffic entering the city centre. The most recent 2012 data indicates the traffic volumes returned to 2010 levels. Total two-way volumes show that overall, AM peak period and peak hour traffic in the years between 2004 and 2012 has reduced by just 1%.

The cordon data also shows that outbound traffic flows in the morning peak period increased by 14.3% between 1990 and 2012. This is considered by the City Council to be a consequence of increased cross-city travel, greater travel to jobs outside of the cordon and to some degree, increased city centre living.

A similar pattern is observed in the PM peak period.

Figure 4.6: AM Peak Inbound Traffic Flows

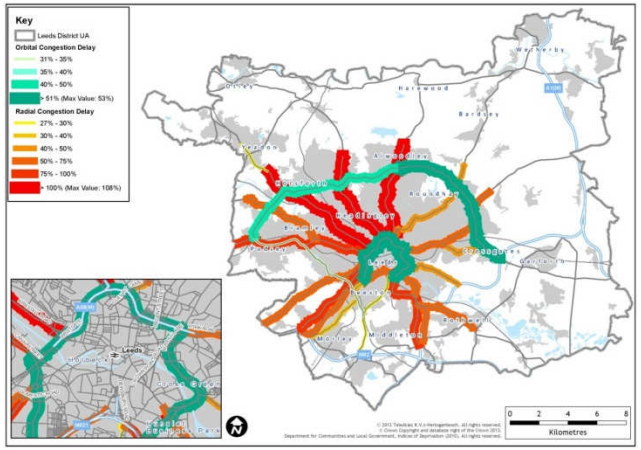


Source: Leeds City Council Monitoring, 2013

The interpretation of this traffic data is that the capacity of the radial road network provides an absolute constraint to the volume of traffic entering the city centre in the morning peak hour and leaving in the evening peak hour. Since 1990 there has been growth in peak period traffic, but this has taken place in the shoulders to the peak hour.

Congestion has been measured by comparing travel times with free-flow daytime travel times between 07:00 and 19:00. The radial routes A61(N), A65 (between Rawdon and the Inner Ring Road), A660, A647, M621(E) and A62 all show high levels of congestion delay with journey times increased by between 80% and 100% because of congestion. The orbital routes of A6110/A647 and A6120 anti-clockwise also show high levels of congestion delay.

Figure 4.7: Congestion in Leeds



Case Study Source: Steer Davies Gleave (2014) *NGT Strategic Fit – A Review*

4.27 The socio-demographic profile of rail travellers was explored by the National Rail Travel Survey[61], a survey undertaken by first the Strategic Rail Authority and then the Department for Transport between 2001 and 2005. This survey showed that:

- The majority of rail travellers are male – 54% male compared with 46% female. Around two-thirds of trips made for business purposes are made by men
- Half of all rail trips are made by people aged between 35 and 60. This proportion increases to nearly two-thirds for business trips
- As a whole, rail travellers have above average household incomes
- Only a fifth of rail travellers do not have access to a car

4.28 NRTS is a national data set. A similar survey of passengers at Leeds City Station[62] undertaken in 2008 showed that:

- In the Leeds survey the majority of rail travellers were female (56%)
- 55% of trips were made by those in the 35 to 64 age bracket
- Household income is above average
- 60% of rail users had access to a car

4.29 Overall, it can be said that rail travellers are older, on average have high household incomes and typically have access to a car.

4.30 From analysis of the National Travel Survey, Le Vine and Jones (2012) have found that nationally[63]:

- Rail growth rates have been relatively low for commuting (+23% over the decade to the 2005/07 NTS survey release) and highest of all for business travel (+168%)[64]
- Growth rates have been virtually flat for shopping and personal business, but high for most other purposes, especially visiting friends and relatives, education, and day trips (each up around 75–85%)
- The fastest growth rates are among employed people who work outside the London area

4.31 In its Long Term Rail Strategy (2014), Rail North identifies that a key driver of the growth in rail demand in the North has been the increases in average commuting distances, noting that rail is particularly well suited to longer distance commuting. It cites evidence that for households with an income of £40,000 or greater, half of all commuting trips are over 10 miles and a quarter are over 25 miles. For households with an income of less than £20,000, only a third of commuting trips are greater than 10 miles. Rail North also identifies that the trend of increasing commuting distances is anticipated to continue.

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[61] DfT (2010) *National Rail Travel Survey Overview Report*

[62] Steer Davies Gleave (2009) *Leeds TIF Surveys – Review of Rail Survey*

[63] Le Vine. S and Jones, P (2012) *On the Move: Making Sense of Car and Train Travel Trends in Britain*, RAC Foundation

[64] Le Vine and Jones set out their findings in terms of rail travel (i.e. passenger kilometres), but as they find that the growth in rail travel is due to a growth in trip making rather than an increase in average trip length, their findings are also applicable to rail trip making

4.32 Also in its Long Term Rail Strategy, Rail North identifies that while for many years rail had excess capacity to accommodate growth in travel into the centres of the Core Cities, now many routes are operating at or close to capacity in the morning and evening peak hours and this is a potential constraint on further growth.

- Like the rest of the country, rail use has grown strongly in the North
- Demand has grown faster than capacity and many rail services in the North experience on-train crowding
- On-train crowding is becoming a potential constraint on future growth of the rail commuting market in the North

Trip making by light rail/metro

4.33 Four of the North's five metropolitan areas have light rail and metro networks. These are:

- Merseyrail Electrics (while actually part of the national rail network, this has many of the characteristics of a metro network)
- Manchester Metrolink
- Sheffield Supertram
- Tyne & Wear Metro

4.34 In 2013/14, collectively Manchester Metrolink, Sheffield Supertram and the Tyne & Wear Metro carried 77.5 million passengers. Total passenger numbers have grown from 69.3 million in 2004/05, mostly due to the expansion of the Manchester Metrolink network[65]. In that period patronage on Sheffield Supertram and the Tyne & Wear Metro grew and then fell, with little change over the entire period. It should be noted though that both Sheffield Supertram and the Tyne & Wear Metro have experienced disruption in recent years due to asset renewal programmes and this has affected patronage.

4.35 As part of its satisfaction surveys, Passenger Focus[66] collects data on the characteristics of tram users. This shows that:

- Around half of tram users are in the 16-34 age bracket
- Travelling to and from work is the predominant journey purpose accounting for 40-50% of trips (depending on the system). Shopping is the next most significant journey purpose
- Around a third of passengers say they have easy access to a car

4.36 Business cases for tram schemes suggest that tram passengers on average have longer journeys than bus passengers but their trips are shorter than rail journeys in the same conurbations. In part this is a function of system design and configuration, with tram stop locations and service patterns purposefully specified to be more attractive for longer journeys than those usually made by bus and to serve markets not already catered for by rail.

[65] Data Source: DfT Table LRT0101

[66] Passenger Focus Tram Passenger Survey – Autumn 2013 Report

- Network expansion in Manchester has supported growth in demand for light rail/metro in the North
- Light rail/metro plays a complementary role to rail and bus. Journeys are typically over a longer distance than bus, but shorter than rail

Looking Ahead

4.37 Each of the North's five city regions has identified that if their economic growth aspirations are to be met, then employment in their respective regional centres must grow. Not only would such growth increase journey to work trips, it will also lead to growth in trips for other purposes, including work-related trips (employers' business) and retail-related trip making.

4.38 To a greater or lesser extent, each city region recognises that to be sustainable, public transport trip making will have to grow to accommodate this increase in city centre activity. Indeed, the goal in Manchester for example, is for there to be no change in the number of peak-period trips into the city centre by car with all additional demand being met entirely by public transport, along with walking and cycling. Similar goals exist elsewhere.

4.39 Currently, city regions' rail and/or metro/tram networks do not have sufficient capacity and coverage to accommodate all growth in public transport patronage into the principal city centres that will be needed if mode share goals are to be met. Increases in network capacity and reach will be needed.

4.40 In addition, trip making to city centres by bus would have to grow.

Roads

4.41 Across the North's Core Cities there is no appetite for significant radial road construction. This has been the position for many years. This said, each of the Core City city regions has a roads programme that is focussed on:

- Enhancing orbital capacity
- Addressing particular pinch points – that is locations where there are significant capacity discontinuities that lead to congestion
- Enhancing access to sites that are identified in policy for regeneration or redevelopment.

4.42 As set out in their respective Strategic Economic Plans, some of these programmes are significant in terms of capital expenditure and their extent. However, and notwithstanding the city regions' programmes, the expectation is that demand will continue to grow and overall congestion will increase. While radial networks may be operating at capacity in the peaks, there remains capacity for growth in the shoulders to the peak, in the inter-peak periods and in the off-peak and at weekends. There is no suggestion from the North's city regions that substantial additional capacity should, or even could be provided to cater for future growth.

4.43 Fiscal measures (i.e. road user charging) to manage and influence road traffic within the city regions are off the agenda for the foreseeable future. Opportunities available to city regions to influence future traffic conditions include:

- Greater use of Urban Traffic Management and Control (UTMC) – extending the scale of existing systems and introducing UTMC in secondary towns and cities
- Integration of local authority UTMC systems with the Highways Agency's management systems

- Creation of city region wide strategic networks that are managed at a Combined Authority level (akin to TfL's strategic road network). Such networks would be subject to a common maintenance policy, investment strategy and policy framework (on development, parking etc.), as well as centrally controlled day-to-day management. While some city regions in the North are actively exploring such approaches (e.g. Manchester), it is noted that elsewhere there is resistance to such approaches from local authorities that are not willing to give up local control and the associated budgets.
- Car parking policy – both in terms of provision and charging. It is noted, however, that in many towns and cities the local authority influence on the supply and cost of parking is limited, with the majority of parking provision being in private sector control. This is true for both public parking and private non-residential parking. Also, local authorities face conflicting pressures to accommodate developers' requests for parking to secure redevelopment while pursuing the goal of limiting parking supply to influence future traffic growth.

Bus

4.44 It is widely accepted by stakeholders across the North that to support growth in bus demand that there needs to be investment to support reduced bus journey times, improve reliability and punctuality, as well as enhance the quality of the bus offer. Bus priority can help deliver a faster and more punctual bus service and can be provided both physically through bus lanes and segregated alignments and by using urban traffic management and control systems.

4.45 There is also a recognition, however, that within the deregulated environment, investment is needed by both operators and by the public sector. As well as the road network, the public sector is responsible for shelters and provides printed timetables, route and timetable information at stops and on-line and real time information that can be provided both at stops and on-line. They provide multi-operator ticketing. Operators provide vehicles and are responsible for their specification, procurement and on-going maintenance. Their operational practices, for example, collecting cash fares and drivers selling multi-trip ticketing can contribute to extended journey times and journey time variability.

4.46 To be most effective, investment by local authorities and bus operators needs to be planned and coordinated. This requires the public and private sectors to work in partnership, which can be formalised using statutory Quality Partnership Scheme and/or Voluntary Partnership Agreements. Such agreements have been successful in supporting growth in bus patronage (see Sheffield Bus Partnership case study).

4.47 It is possible, however, that some local transport authorities come to a view that their policy goals cannot be met through partnership working and that only a Quality Contract Scheme (QCS) will allow these to be met. Thus far, no QCS has been introduced although Nexus has well advanced proposals for Tyne & Wear. Whether these are implemented remains to be seen. What is clear, however, is that introducing a QCS is a particularly challenging course of actions because of the financial and transition risks associated with any proposal.

4.48 Many authorities are investing in bus priority measures, enhanced shelters and web-based solutions to provide passenger information. There is, however, some notable political opposition to on-street bus lanes in some cities in the North with the view that priority should be given to the private car. In Liverpool, bus lanes have been suspended. Elsewhere,

authorities can find it challenging to introduce bus lanes which require road space reallocation or removal of parking or property acquisition. These, however, can be the locations where bus priority can be most effective.

4.49 As well as offering the potential to speed boarding times, smart ticketing can also help make bus more attractive through allowing the introduction of new ticketing products and pricing options, but this can only be introduced in a way that is most attractive for users on a multi-operator and cross-mode basis by local authorities and operators working together. This can be challenging in a deregulated market where operators use fares and ticketing as a way of securing market share.

4.50 In addition to providing city centre access for journey to work trips and the trips that enhanced city centre economic activity will generate, bus is also an important access mode to principal inter-city rail stations. As we set out in the previous Chapter, many city region to city region rail trips, be they for business or other purposes involve a feeder leg at least one end of the journey. Measured by number of passengers, bus has the potential to be the most important public access mode to the development that is anticipated to cluster around the proposed HS2 stations.

4.51 While the discussion here has focussed on bus services into principal city centres, bus services are the core of the public transport network serving other towns and cities within the city regions and the principles set out above apply equally to these services. However, this does not mean that all proposed developments are well suited to being served by bus and the location and access arrangements for many out-of-town retail and commercial developments, as well as many new residential developments can make them challenging to be served by bus in a commercial and deregulated market.

4.52 Overall, there appears to be a gap between the need and ambitions to grow bus use to support sustainable economic growth and local authorities' ability to implement change and secure the service enhancements that are integral to growing the bus market. For bus to play its full potential role in supporting economic growth, this public policy gap needs to be addressed.

- To support growth in the bus market journey times need to be reduced, punctuality and reliability improved and quality on- and off-bus enhanced
- In the deregulated bus market that exists out of London, local authorities cannot achieve this working alone and they need to work together with their operators
- Partnership approaches have delivered improvements and these have supported growth
- However, there appears to be a public policy gap between the ambitions and need to grow the bus market and actions that local authorities can take

Sheffield Bus Partnership – A Case Study

In November 2012, the Sheffield Bus Partnership (SBP) agreement was formally signed by bus operators, SYPTE and Sheffield City Council. The partnership provides the basis for collaborative working between all parties to improve vehicle quality, network stability, fare structures and enhanced service information within the Sheffield and South Rotherham area.

Two years on, the combined operations of bus services has delivered a significant level of improvement to the local transport network and improved local accessibility and connectivity. There have been evidenced reductions in congestion, which have subsequently facilitated improvements to reliability and punctuality of bus services, as well as delivering benefits to other road users. In relation to patronage, there has been a 14% increase in adult fare paying passengers since 2012, reversing a previous trend of declining bus use.

The bus partnership has been instrumental in ensuring a step change in bus services that are provided to customers. The framework of the partnership has been a rigid platform to provide better value, multi-modal ticketing solutions direct to the existing and potential bus services, whilst also promoting an increase in the quality of vehicle. As agreed by the partnership, there is an ambition to have replaced a total of 250 vehicles with new, low floor, environmentally friendly vehicles by 2017.

The outcomes of the partnership have been critically acclaimed, with national recognition of its achievement by bus companies and other local authorities. It has gained substantial political approval which has reinforced its continued operation and roll out to other areas of South Yorkshire. SYPTE remains committed to the delivery of the SBP as improvements to patronage, customer experience and reliability help promote efficient movements on the local transport network and aid accessibility to jobs, education and leisure.

Case Study text provided by SYPTE

Rail

4.53 Rail demand is forecast to continue to grow. Network Rail's Regional Urban Market Study has produced four growth scenarios for peak rail demand. The lowest and highest of these are summarised in Table 4.4 below.

Table 4.4: Network Rail Growth Scenarios – Peak Growth into City Centres to 2042-43

	Lowest growth scenario	Highest growth scenario
Leeds	24%	114%
Liverpool	18%	104%
Manchester	25%	114%
Newcastle	15%	99%
Sheffield	19%	105%

Data source: Figure 6.6, Network Rail (2013) *Long Term Planning Process: Regional Urban Market Study*

4.54 The scenarios produced by Network Rail are deliberately extreme and do not represent a central case forecast comparable to those used for businesses cases for rail infrastructure investment. HS2 Ltd has developed its own forecasts of the growth in rail demand in the North. These have been produced using the Planet Framework Model and are summarised in the previous Chapter in Table 3.10.

4.55 A number of important assumptions underpin these forecasts. In particular:

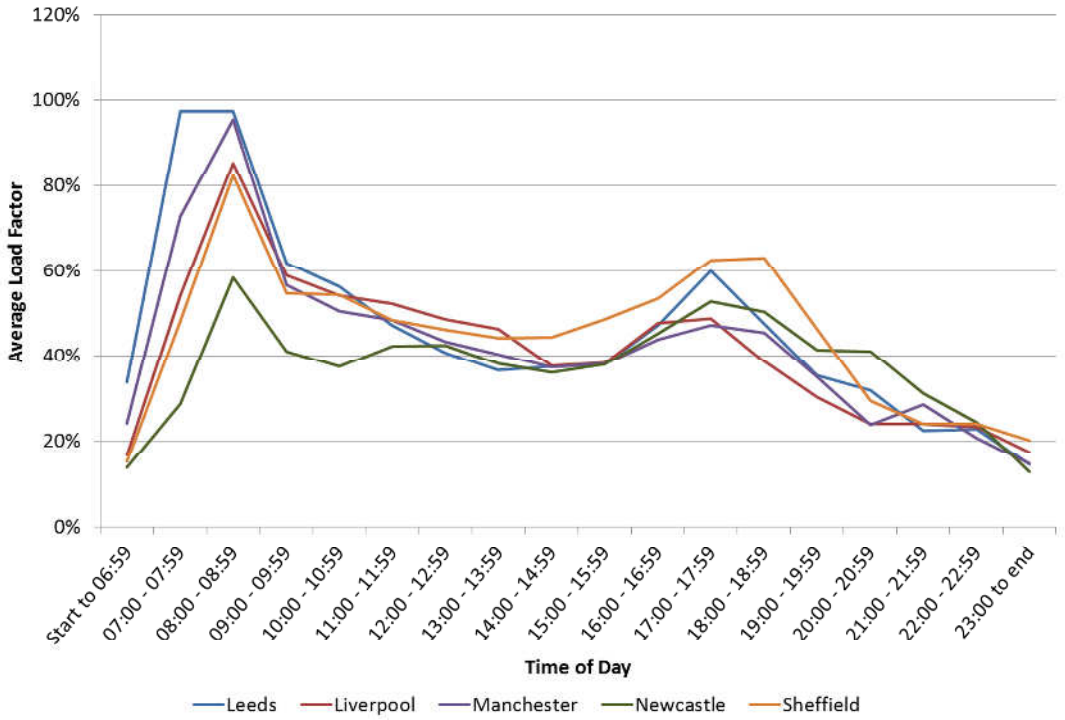
- There will be some further investment in network enhancement and service development. With a few exceptions, these 'do minimum' assumptions are based on committed schemes[67]. There will, however, be future network and timetable development which is either not yet committed, or even not identified, that will influence the number and distribution of future rail trips
- The HS2 Ltd forecasts adopt the Department for Transport's projections and distribution of future population and employment. These assumptions do not reflect the Strategic Economic Plans of the five northern Core City city regions, each of which assumes that employment will increase faster than assumed by DfT and by inference, that there will also be a population increase to support this additional employment. Indeed, it is argued by the Liverpool city region, for example, that the DfT projections do not adequately reflect employment and population growth that has occurred in recent years, never mind its view on future growth. Furthermore, these projections do not capture the impact of HS2 on supporting growth in employment and hence the impact that this will have on trip making
- They assume that there are no significant capacity constraints that will constrain growth.

4.56 Rail North (2014) has identified that there is currently crowding on many services, particularly on those into the major centres at traditional peak times, but also elsewhere on the network and at other times too. Rail North goes on to identify that rolling stock utilisation is now at such a level that there are limited opportunities to handle on-going demand growth with the existing fleet. Shown in Figures 4.8 and 4.9 are average load factors upon arrival and

[67] The specific changes assumed by HS2 Ltd are set out in HS2 Ltd (2013), *The Economic Case For HS2: PFM v4.3 Assumptions Report*

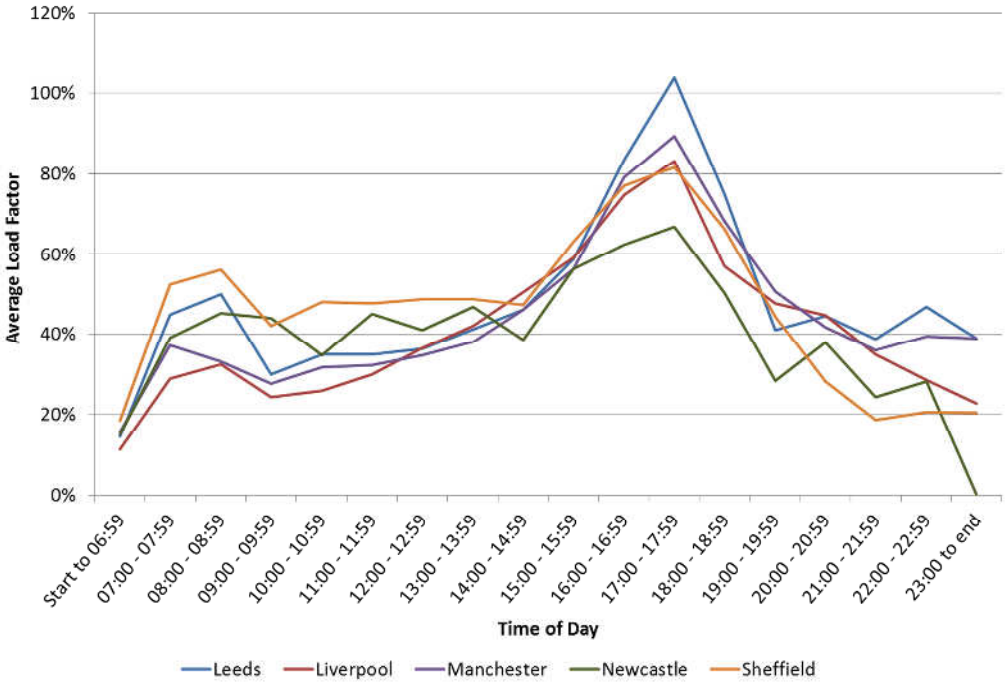
departure from Core City city centre stations across the day. These can mask that some trains will more crowded than the average.

Figure 4.8: Average load factor on arrival into city centre



Data source: Department for Transport: Rail passenger numbers and crowding on weekdays in major cities in England and Wales: 2013

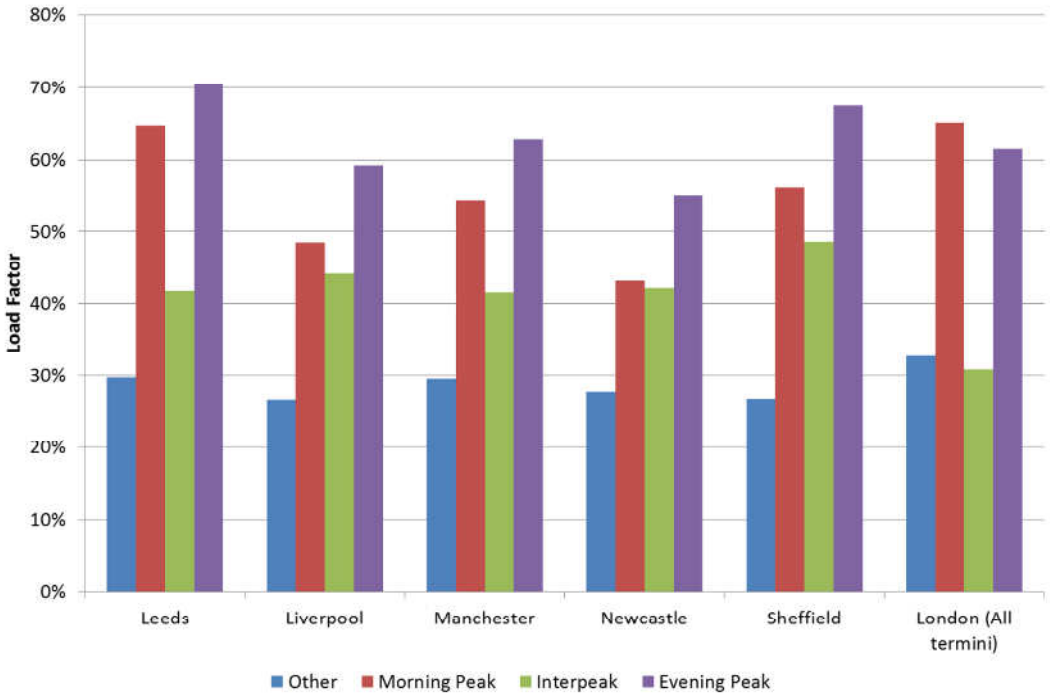
Figure 4.9: Average load factor on departure from city centre



Data source: Department for Transport: Rail passenger numbers and crowding on weekdays in major cities in England and Wales: 2013

4.57 It is evident from Figure 4.10 that load factors in the inter-peak period are higher in the Northern City Regions than in London. This may reflect optimisation of the rolling stock fleet to match supply and demand over the course of the day, but is also likely to reflect the limited availability and capacity of the rolling stock.

Figure 4.10: Average load factor on arriving and departing services



Data source: Department for Transport: Rail passenger numbers and crowding on weekdays in major cities in England and Wales: 2013

4.58 Rail North (2014) also notes that the quality of rolling stock is a very important issue for passengers. It identifies a 2012 Passenger Focus study which found that Northern Rail trains are felt to be at best uncomfortable but at worst dangerous, and passengers feel that the age and poor appearance of trains is symptomatic of a lack of respect for customers.

4.59 The rail network in the North faces infrastructure constraints which limits both the number of additional trains that can be operated and the ability to operate new routes. Enhancements such as the Northern Hub and North West and Trans Pennine electrification will increase network capacity and allow frequency enhancements on some routes. Further electrification proposals are currently being considered by the Electrification Task Force which is due to report to the Secretary of State by December 2014[68]. These will offer further opportunities for capacity enhancement.

[68] https://www.gov.uk/government/news/road-and-rail-projects-to-boost-local-and-regional-transport--2

4.60 Nonetheless, capacity constraints will remain, particularly on the approaches to the stations at the centres of the Core Cities including Liverpool Lime Street[69], Leeds and Sheffield[70] and at the stations themselves, in terms of both the number of platforms and the ability to cater for the longer trains that would be needed as part of a solution to enhance on-train capacity. Both station layouts and the capacity of their approaches limits the opportunities to run trains across cities. As well as offering potential operating efficiencies, cross-city rail services are a way of extending labour markets and connecting areas of population with the location of employment growth.

4.61 A further constraint to be considered is stations themselves. Many stations in the North are unstaffed and while on-going programmes have improved many stations, others are still unattractive to users, especially travellers who may have concerns for their own personal safety[71].

4.62 The current modelled service pattern underpinning the Business Case for HS2 provides some released capacity for additional commuter rail on routes to Manchester from the south via Macclesfield and Wilmslow[72]. However, as the industry is only in the early stages of planning how to make the best possible use of the post-HS2 network, it is too early to draw any definitive conclusions on HS2-related released capacity benefits for commuter services across the North.

4.63 The integration of many stations into their local pedestrian and public transport networks is poor. Those stations that do have car parks find them well used and often at capacity with rail users parking in surrounding (and often unsuitable) streets[73]. Availability of car parking will become a constraint on growth at some stations.

4.64 There are also the main destination stations. Each has capacity constraints on their circulatory capacity and if the projected growth does occur, crowding at barrier lines, stairs and escalators and congestion on some platforms has the potential to be a serious constraint. While facilities at the Core City stations have been improved in recent years, there remains scope for further enhancement which will make them more attractive to users and so support growth. Stations in many secondary towns and cities are particularly poor (e.g. Bradford Forster Square).

- Rail trips on the commuter networks in the North are forecast to grow
- However, rail networks across the North face constraints that if not addressed would mean that this growth cannot be realised
- Many peak hour commuter services in the North are crowded. Many services are operated by old and poor quality rolling stock.
- Core City stations have capacity and capability constraints – these relate to the tracks approaching the stations and platform configurations
- If growth does occur as projected enhancements to Core City stations' circulatory capacity will be needed

[69] See Merseytravel (2014) *Long Term Rail Strategy*

[70] See Network Rail (2009) *Yorkshire and Humber Route Utilisation Strategy*

[71] See Rail North (2014) *Long Term Rail Strategy*

[72] See DfT (2013) *Strategic Case for HS2* p75

[73] See Rail North (2014) *Long Term Rail Strategy*

- Many suburban stations are poor quality, have insufficient car parking and are poorly integrated into their local transport networks. All these factors limit demand growing to its full potential

Light rail/metro

4.65 There are no long term projections of light rail/metro demand that have been produced on a consistent basis for the existing systems in the North. Nonetheless, those city regions in the North that have metro/light rail systems have aspirations for their expansion as they see them as playing a central role in catering sustainably for future trip making in their city regions.

4.66 Given the failure of the previously proposed light rail schemes for Liverpool (Merseytram) and Leeds (Supertram) to secure Government funding (because of escalating costs eroding the value for money case), even with devolved decisions on local transport funding there appears little prospect of any further light rail systems being built in the North. Even if proposals were brought forward, the planning process is such that it would be a minimum of ten years or so from inception to construction.

4.67 The most likely way that the role of metro/light rail in the North can be developed is through the extension and expansion of existing systems. The Manchester Metrolink system has been significantly extended in the last three years with lines added to Oldham and Rochdale (a conversion of a national rail route with street-running sections in the centres of Oldham and Rochdale), Ashton-under-Lyne (predominantly street running), East Didsbury (on a disused rail line) and Manchester Airport (new alignment and street running sections). A second line across Manchester city centre is currently under construction. TfGM is progressing plans for a further extension to Trafford Park, with a Transport & Works Act Order application scheduled for submission next year. Further extensions are being considered.

4.68 In South Yorkshire, funding has been awarded for a 'tram-train' extension of the Supertram network to Rotherham. This is a national trial of this technology that allows street-running trams to operate on the national rail network alongside other rail traffic.

4.69 Network Rail (2013) notes the opportunity in those cities that have established light rail networks for conversion of rail routes to tram-train operation[74]. This offers a potential solution to the twin goals of extending the coverage and reach of metro/light rail systems while relieving capacity at mainline terminal stations. With such conversions, tram-train vehicles would replace conventional trains and operate on the conventional rail network before joining the on-street tram network. However, tram-train vehicles will typically have a lower capacity than conventional trains and will also have lower maximum speeds and so longer journey times. As a consequence, only a limited number of routes will be suitable for such conversions. Nonetheless, tram-train opportunities have been identified in Manchester and in South Yorkshire, and extend the operation of the Tyne & Wear Metro onto the national rail network.

4.70 Finally with regard to light rail/metro it is noted that for these systems to meet their full potential, it is important that they are renewed and enhanced. The Tyne & Wear Metro is undergoing a renewal and enhancement programme at present. Phase 1 of Manchester Metrolink was renewed some years ago and the original tram fleet replaced. The current operating concession for Sheffield Supertram expires in 2022 by which time its tram fleet will

[74] Network Rail (2013) *Network RUS: Alternative Solutions*

be 30 years old and should be anticipated to require replacement alongside a major programme of system renewal. Vehicles on the Tyne & Wear Metro and trains on the Merseyrail network are ageing and there is only so much that can be achieved with refurbishment. At some stage, replacement will be needed. The Liverpool City Region *Long Term Rail Strategy* sets out aspirations for the enhancement of the Merseyrail network and the extension of the Merseyrail standard of service to other local rail services in the city region.

- Light rail/metro should play a central role in the sustainable economic growth of city regions
- System extension can extend the scope and coverage of the existing systems of the North
- There is no prospect of new metro/light rail systems elsewhere
- Tram-train technology can allow further expansion of the Manchester Metrolink, Sheffield Supertram and Tyne & Wear Metro systems while at the same time relieving some of the pressure on city centre rail stations
- To maintain the role of light rail/metro systems in their respective city regions, renewal will be required periodically

Exploiting Opportunities

4.71 Integral to the North's city regions meeting their full economic potential will be policies to support and facilitate the growth of economic clusters. Across the North:

- High productivity services sectors are concentrated in the centres of the Core Cities and these have the potential to grow.
- However, it is not just city centres where there is growth potential. There are service sector clusters being developed elsewhere, for example Airport City in Manchester, and there are secondary centres across the North's city regions
- Manufacturing remains important across the North. These activities are not located in city centres, but within city regions. These sectors have their own labour markets and just like the service sector have the potential to benefit from extending labour markets
- Overall, in order to grow, clusters – whether they be in the service sector or in the wider economy - need access to the largest possible labour market and therefore the journey to work is important

4.72 HS2 will be an accelerant of growth. This will occur both around the HS2 stations[75] and in general across city regions. In isolation this additional growth could exacerbate problems on local road and public transport networks. However, enhancements to the management and connectivity of these networks will:

- Improve the connectivity of the HS2 stations and so offer the opportunity to amplify the economic benefits that they will bring to the North's city regions
- Support further redevelopment and regeneration around the HS2 stations

4.73 For HS2 to maximise its benefits, its stations need to be accessible from across the city regions that they serve. Enhancing linkages and in particular public transport linkages within a city region creates the opportunity to create a virtuous circle: enhanced connectivity will extend the scope and scale of benefits that HS2 will deliver and extend labour markets. The latter will support further growth, which in turn will generate additional demand for HS2.

[75] Atkins (2014) *Maximising the Growth &Regeneration Benefits ofHS2*

5 Access to International Opportunities

Summary

- The North has eight airports that have scheduled international connections
- As well as providing for business travel, international connectivity from the North's airports is part of the North's quality of life offer
- Airports are also important sources of employment in their own right and a focus for inward investment
- Manchester Airport is the largest airport in the North with passenger throughput greater than all the other northern airports combined. It offers intercontinental connectivity. It is the only airport in the North connected directly to the national rail network and Strategic Road Network
- Given the distance to alternatives, Newcastle Airport has an important role serving the North East market
- All other airports in the North have a catchment beyond their immediate city regions
- Passenger numbers through the northern airports are forecast to grow
- Surface access is seen as the biggest single constraint on Manchester Airport's future growth. Central to the Airport's masterplan is growing rail's mode share, but this will require investment as well as changes in the way the rail network operates.
- Leeds Bradford Airport has particularly challenging road access. There are aspirations for improved road access to Liverpool John Lennon and Durham Tees Valley airports.
- The North's estuarial ports of the Humber, Tees and Mersey are of national importance. Other ports in the North play important roles in their regional economies
- The largest forecast growth sector is inter-modal containers, a market well suited for domestic movement by rail
- Each of the largest estuarial ports on the Humber, Tees and Mersey are rail connected, but there are shortfalls in network capability to cater for the latest generation of inter-modal containers on standard wagons and parts of the network face capacity constraints. There is no gauge-cleared trans-Pennine route.
- Road access is, and will remain, important for ports. The ports of Liverpool and Hull both have challenging road access

Introduction

5.1 As we established in Chapter 2, connectivity to international gateways is important for the future economy of the North because it:

- Increases the attractiveness of the North to Foreign Direct Investment (FDI)[76]
- Improves the capability of UK businesses to access and exploit markets abroad
- Permits the import and export of primary inputs, intermediate goods and manufactured final products

5.2 Direct connectivity from the North's airports offers the potential for quicker and more convenient door-to-door journeys for both business and leisure passengers. Similarly, direct connectivity from the North's ports offers the potential for quicker and overall lower cost movement of goods. There are clear economic benefits to be derived from enhancing the North's connectivity to international markets.

5.3 The North's ports and airports are also significant employers in their own right with associated indirect and induced impacts on the economy.

5.4 In this Chapter we consider the current and potential future role of the North's airports and ports, and in particular the constraints and opportunities that they face.

Airports

Current Throughput

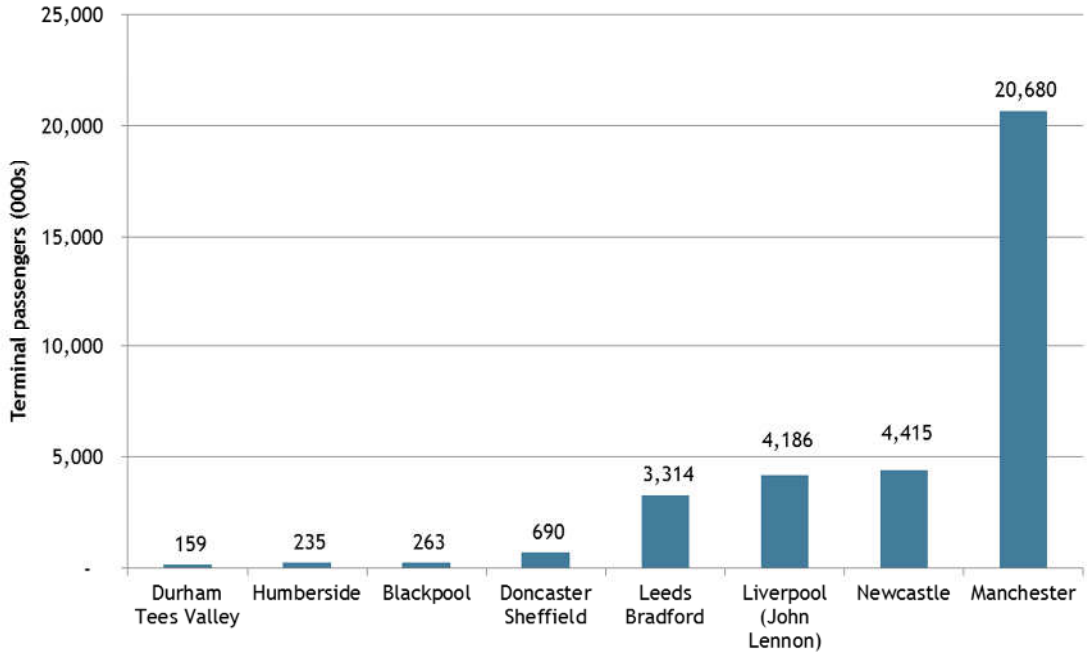
5.5 The North has a number of airports that have international scheduled connections. These are Blackpool, Durham Tees Valley, Humberside, Leeds Bradford, Liverpool John Lennon, Manchester, Newcastle and Robin Hood Doncaster Sheffield. The annual passenger throughput of these airports is shown in Figure 5.1.

5.6 As can be seen from the graph, in terms of passenger numbers, Manchester is by far the largest airport in the North with a throughput 50% larger than the throughput of all the other airports combined. As well as serving an extensive network of European destinations, Manchester Airport offers intercontinental connectivity with scheduled services to North America, the Gulf States (which offer onward connectivity to the Indian Subcontinent, China and the Pacific Rim) and to the Far East (Singapore and soon, Hong Kong). Manchester's comparatively extensive network of scheduled routes means that it is the most important business-focussed airport in the North.

5.7 As shown in Figure 5.2 the airports in the North experienced a reduction in throughput through the Great Recession and associated cut-backs in their scheduled networks. Demand is now recovering and growth in passenger demand has returned to many of the airports in the North. The recoveries of Leeds Bradford and Manchester airports have been particularly strong since 2010. However, the closure of Blackpool Airport was announced by its owners in October 2014.

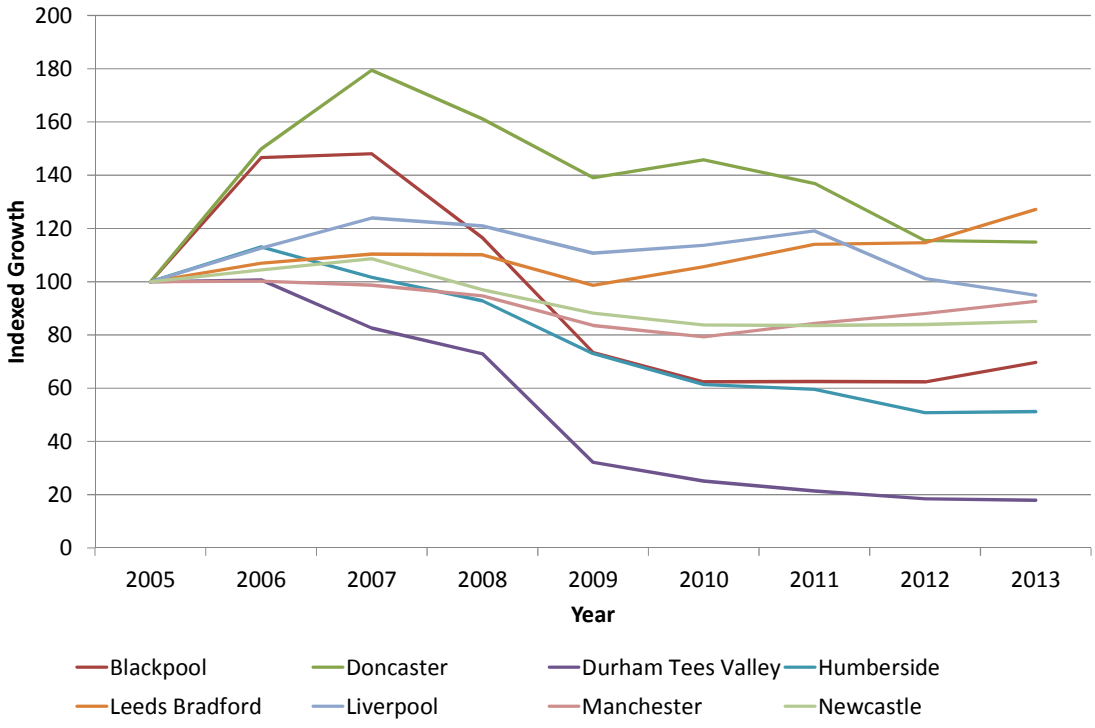
[76] For example, see Northern Way (2011) *The Importance of Improving International Air Connectivity for the North's Economy*

Figure 5.1: Airport Terminal Passengers (2013)



Data Source: CAA Aviation Trends – scheduled and charter terminal passengers

Figure 5.2: Indexed Year on Year Growth of Passenger Demand at Northern Airports (base year 2005)



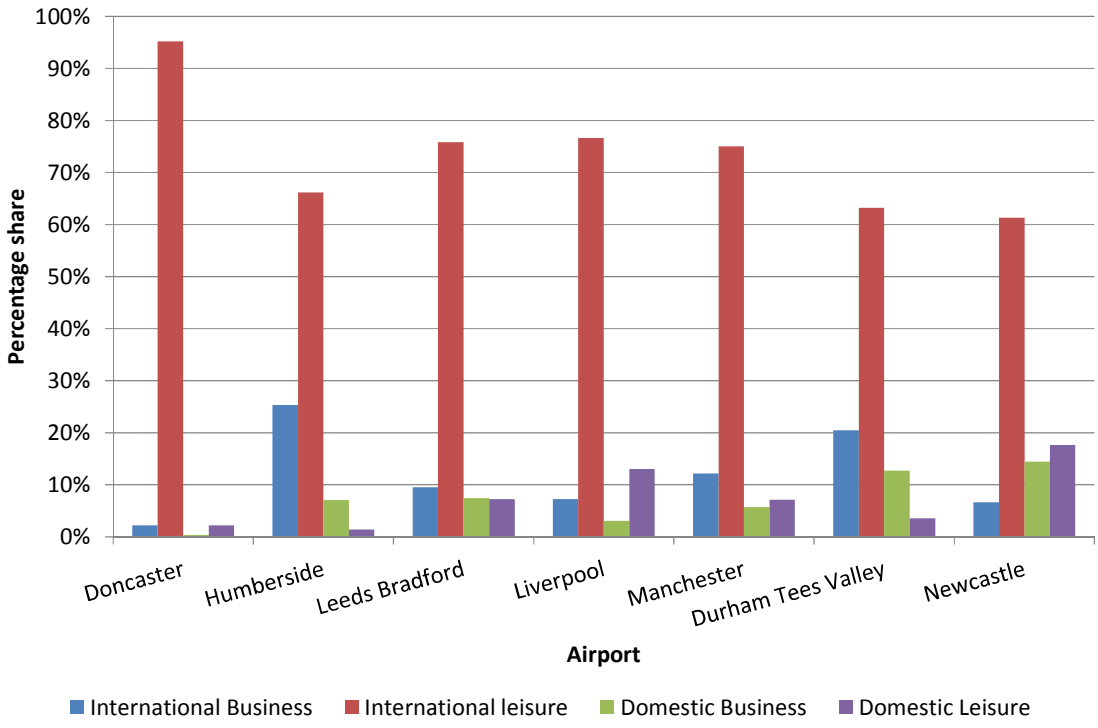
Data Source: CAA Aviation Trends – terminal and transit passengers

5.8 Each of the airports in the North serves a catchment greater than the immediate city regions within which they sit. Manchester Airport's network of scheduled destinations and its charter destinations, many of which are served uniquely in the North, means that it attracts passengers from across the northern regions.

5.9 Each of the other airports draw their demand from a wide area, in no small part because of the route networks offered by the low cost carriers and their competition on price, which extends airport catchment. Because its catchment is relatively distant from the other airports in the North, Newcastle Airport serves a particular local function serving the population of the North East and, as well as scheduled flights to European destinations, it offers intercontinental connectivity via Dubai.

5.10 As shown by Figure 5.3 the majority of airport usage in the North is for international leisure travel. International business, however, makes up a substantial minority of airport usage from the northern airports.

Figure 5.3: Airport Usage by Travel Intention



Data Source: CAA Annual Passenger Surveys 2012 (comparable data for Blackpool airport is not available)

5.11 Access to London Heathrow and the intercontinental connectivity that it offers is currently and is likely to remain very important for Northern business[77]. Scheduled flight to Heathrow are available from Manchester (12 flights per weekday), Newcastle (6 flights per weekday) and Leeds Bradford (3 flights per weekday). Civil Aviation Authority data suggests Manchester serves a substantial number of interlining passengers, with 82.8% of all passengers travelling between Manchester and London Heathrow going on to take a connecting flight to/from

[77] Northern Way (2011) *The Importance of Improving International Air Connectivity for the North's Economy*

Heathrow[78]. We would expect to observe a similar proportion of passengers taking connecting flights when travelling between Leeds Bradford Airport and London Heathrow but, due to the longer journey times involved, a still large but smaller proportion from Newcastle Airport as point-to-point journeys are more likely to be worthwhile.

5.12 Airports are also important for freight. Reflecting the importance of belly-hold capacity on long haul scheduled services, measured by tonnes throughput Heathrow is by far the most important airport for freight in the country accounting for 63%[79] of demand. The next most important airport is East Midlands, which has a nationally important role as a hub for the freight integrators (DHL, FedEx, etc.) and caters for 12% of the national market. Given its national role, access to East Midlands Airport is important for the North. Manchester is the biggest freight airport in the North, with 4% of the national market. The nature of air freight means that it accesses the airport by road.

5.13 Airports also provide a location for economic clusters, particularly those that benefit from international connectivity. These clusters can have high levels of FDI. The first phase of Manchester's Airport City is planned to be the home for 15,000 jobs[80]. The Newcastle International Airport Business Park incorporating the development of 4 sites has the capacity to support 7,000 jobs[81]. Proposals are also being brought forward for development around Robin Hood Doncaster Sheffield, Durham Tees Valley and Liverpool John Lennon airports.

Forecast Demand

5.14 Figure 5.4 summarises the Department for Transport's latest aviation forecasts for airports in the North. Between 2011 and 2040 the level of demand at Manchester Airport is forecast to more than double according to DfT's central scenario. In relative terms, a strong level of demand growth is also forecast at Leeds Bradford Airport, with more modest increases for the remainder of airports in the North[82].

[78] Civil Aviation Authority Survey 2013

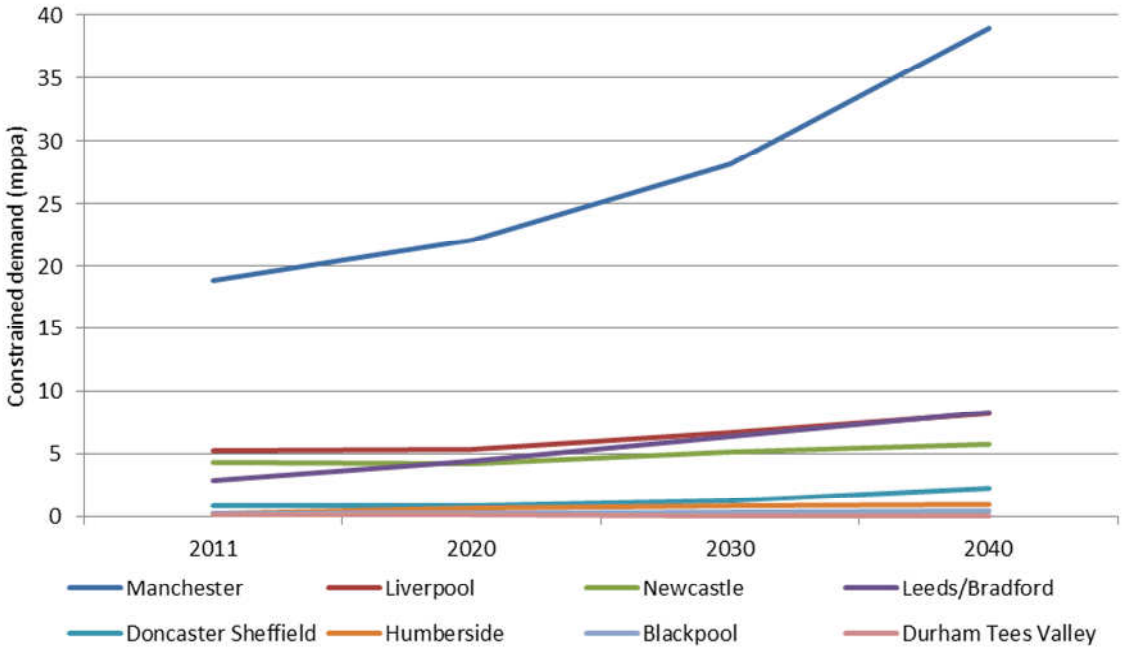
[79] Percentages for Heathrow, East Midlands and Manchester calculated from Table 13.2 UK Airport Statistics

[80] TfGM (2014) HS2 and One North Local Connectivity in Greater Manchester - response to DfT questions

[81] North East LEP (2014) *More and Better Jobs: A Strategic Economic Plan for the North East*

[82] Constrained forecasts not only reflect the attractiveness of a given airport but also the deterrence effects of other airports reaching either terminal

Figure 5.4: Forecast Constrained Demand Growth for Northern Airports



Data source: DfT Aviation Forecasts 2013

Current Constraints

5.15 Airports in the North face a number of constraints which will influence their future development trajectory. Noting that bringing forward airside and terminal development is largely a commercial matter for airport owners, of particular relevance to this report is surface access.

5.16 Manchester Airport currently has capacity for 27 million passengers per annum and has a masterplan to allow for phased expansion to 55 million passengers[83]. Surface access has been identified as the most significant single constraint on its future development[84]. The M56 and M60 motorways are congested and local roads are capacity constrained. The latter is partly being addressed by the construction of the M56 to A6 link road. Nonetheless, central to realising the Airport's masterplan is growing rail's mode share.

5.17 At present, however, while served directly by the national rail network, rail connectivity is seen as a limiting factor in terms of a limited range of destinations with direct connectivity, the hours of rail's operation not aligning with the daily pattern of airport throughout, train service unreliability and airport services being affected by on-train congestion elsewhere on the network. The Northern Hub package and North West and trans-Pennine electrification will facilitate an enhancement of Manchester Airport's rail connectivity by allowing the airport to be served by more trains and introducing the capability to serve a greater range of destinations directly (e.g. the Calder Valley and Bradford).

[83] Manchester Airport Group (2013) *Capacity for Growth: MAG Submission to the Airports Commission*

[84] Manchester Airport Group: *Manchester Airport Master Plan to 2030*

5.18 Leeds Bradford is seen as having particular road access problems and these are currently subject to a Government-sponsored study to develop a way forward. The Strategic Economic Plans for Liverpool and Durham Tees Valley include proposals to enhance road access to their respective airports, partly to facilitate airport growth and partly to support airport-associated development. The Finningley and Rossington Regeneration Route Scheme (FARRRS) road scheme, currently under construction, will improve road access to Robin Hood Doncaster Sheffield Airport. The Mersey Gateway Bridge will improve road access to Liverpool John Lennon Airport from the east. Within their respective SEPs there are longer term aspirations to enhance public transport access to each of these airports.

5.19 Newcastle Airport has recently benefitted from junction improvements on the A1, which have addressed some of its most immediate road access problems. However, given that much of the airport's market is to its south, congestion on the A1 Newcastle Gateshead Western Bypass is seen as affecting the airport too.

Opportunities

5.20 HS2 will enhance airport access to/from the North by:

- Improving access to Heathrow via interchange at Old Oak Common. As well as significantly reducing journey times by rail, the interchange and onward journey from Old Oak Common will be more attractive than the current options from King's Cross, St Pancras and Euston with onward connections to Heathrow via the Piccadilly line or Heathrow Express/Connect through Paddington.
- Improving access to Birmingham Airport via Birmingham Interchange. This will create a new viable airport alternative for many in the North.
- Improving access to Manchester Airport via Manchester Interchange station. This will be particularly so for passengers accessing the airport from the south. However, for much of Manchester Airport's current catchment, rail access from the classic network will be most important post HS2.

5.21 Manchester Airport is the only airport in the North currently served directly by the national rail network. There is evidence[85] that air passengers have a stronger preference for direct rail services to airports than those that involve interchange. This is partly because of the added uncertainties that interchange can bring to usually time critical journeys and also because air passengers often are travelling with luggage. Facilitating more direct links from across the North and the Midlands to Manchester Airport would make access by rail more attractive and would support growth and contribute to the Airport's masterplan mode share targets. Already the Northern Hub package will extend the range of destinations that can be served directly by rail by providing new linkages across Manchester (for example to the Calder Valley and Bradford) and will provide additional capacity at the Airport railway station. However, Newcastle, Durham and Darlington, for example, do not have direct rail services to Manchester Airport and no such services are planned as part of the Northern Hub package.

5.22 Further opportunities to support the growth of rail to access Manchester Airport come from extending the hours of rail's operation to match better the hours of operation of the airport. One of the peak times for check-in at the airport is between 5am and 6am and current rail operating hours do not allow for such journeys to be made by train. Similarly, one of the peak times for arrivals is late in the evening at which time rail services on routes to the airport are

[85] For example, see Northern Way (2009) *Manchester Hub Conditional Output Statement*.

either infrequent or have stopped for the day. Some passengers find that given their flight departure and arrival times it is not possible to make rail journeys for both arrival and departure legs.

5.23 The reliability of rail services is also an issue. When the network experiences disruption one of the recovery strategies is to terminate airport bound services short in the centre of Manchester. While the Northern Hub infrastructure should help improve performance, this issue is not just one of infrastructure – operational practices are important too.

5.24 There are longer term aspirations to enhance public transport accessibility to other airports in the North. These include rail access to Robin Hood Doncaster Sheffield from a new station on the Doncaster to Lincoln line, as well as suggestions for a parkway station on a diverted East Coast Main Line; proposals to serve Leeds Bradford Airport by a tram-train service; and, enhanced rail services on the line between Darlington and Stockton/Thornaby to service Durham Tees Valley airport. The case for each of these schemes will be inherently linked with the case for enhanced rail services in the wider areas that they serve: airport demand will be just one part of the business case.

5.25 Further opportunities to support the development of the North's airports are inextricably linked with the future development of the Strategic Road Network and local roads, as well as the development of local public transport networks. These have been covered in earlier Chapters and so are not repeated here.

Ports

5.26 The three estuarial port complexes in the North around the Humber, the Tees and the Mersey serve national roles. Measured by tonnes lifted in 2013 Grimsby and Immingham on the Humber is the largest port in the country, Tees and Hartlepool is ranked fourth, the Port of Liverpool sixth. Elsewhere in the North, the Port of Hull is the twelfth largest port and the Port of Tyne is seventeenth[86].

5.27 These northern ports are national assets. Together they account for 35%[87] of the tonnes lifted through UK ports in 2013. The Mersey ports are the principal national gateway port for short sea shipping to Ireland and deep sea shipping to North America. The Tees and Humber ports are best located to serve the Scandinavian, Baltic and North European markets. Coal and biomass for the electricity supply industry is imported through northern ports. They also play a key role in the export of goods, for example cars manufactured by Nissan from the Port of Tyne. The hinterland of the North's ports extends well beyond the three northern regions into the Midlands and Scotland, and into the South East for some traffic[88].

5.28 Total weight of goods passing through the nation's ports is now lower than it was a decade ago. In part this is due to the impact of the Great Recession, but in part is a function of the changing nature and structure of the national economy, and as we set out in Chapter 1, these changes have been happening over many decades.

5.29 One area where significant future growth in port throughput is expected is in unitised trade (containers). These arrive in UK as roll-on roll-off (Ro-Ro) on ferries from the near Continent

[86] DfT PORT 0101

[87] Derived from DfT PORT 0101

[88] See Northern Way (2008) *Airports, Ports and the Northern Economy*

and Ireland and as load-on load-off (Lo-Lo) on short sea shipping routes from the Continent and on inter-continental deep sea shipping routes. Network Rail (2013)[89] reports that deep sea containerised cargo is forecast to increase by 2.7% per annum to 2023, by 2.0% per annum between 2023 to 2033 and by 1.7% between 2033 and 2043. While projecting a significant increase, it should be noted that the average growth rate in deep sea containerised cargo between 2001 and 2007 was much higher at 6.4% per annum.

5.30 However measured, nationally Felixstowe in the most important port for Lo-Lo traffic. In 2013, it accounted for 41% of all Lo-Lo goods lifted. Between them Southampton and the Thames Estuary ports account for a further 28% of Lo-Lo goods lifted. In the North, Liverpool is the largest Lo-Lo port accounting for 8% of national throughput and together Teesport, Hull and Immingham account for a further 8%[90]. Reflecting the projected growth in Lo-Lo traffic, there are proposals to expand capacity on the Mersey, Tees and Humber estuaries. For example, the "Liverpool Two" container terminal, will increase the Lo-Lo cargo that can be handled by the port from 700,000 Twenty-foot Equivalent Units (TEUs) per annum to 2m TEUs by 2020 and 3.7m TEUs per annum by 2030. As set out in the Liverpool City Region SEP, this is one part of a wider "Superport" proposal to create a logistics hub focussed around the port and airport with the goal of securing value-added activities (e.g. distribution), as well as cargo handling. The development of port facilities is a commercial decision for the respective owners of the ports.

5.31 The ports on the Mersey, Humber (Grimsby/Immingham and Hull), Tees and Tyne are all rail connected. Rail is important for the onward movement of bulk goods, such as coal for the electricity supply industry. Highlighting the importance of rail for bulk goods, according to its owners, ABP, Immingham handles 260 freight train movements per week. Rail is also an attractive mode for the onward carriage of Lo-Lo containers, given the economies that it can offer over road for longer distance movements. However, if the latest generation of containers are to be carried on standard wagons (the most economical way of hauling containers), then the rail network needs to be gauge cleared to at least W10 standard.

5.32 Electrification in the North West and across the Pennines and elsewhere in the country is extending the scope of the gauge cleared network, as is the implementation of Network Rail's Strategic Freight Network. It remains the case, however, that even with these enhancements the access from northern ports to a gauge cleared network is limited, both in terms of the routes available and the paths that can be utilised. In particular, even with trans-Pennine electrification there will be no available gauge cleared route and no additional day-time freight paths across the Pennines, which limits the Port of Liverpool's rail access to the distribution hub in South and West Yorkshire and rail access from the Tees and Humber to the North West.

5.33 Furthermore, immediate access routes to the ports are not electrified. Container trains from these ports either have to use diesel traction (which is higher cost and is slower, with a greater call on network capacity) or change traction, which also incurs additional time and money costs.

5.34 Road access is, and will remain, important for ports. Almost all Ro-Ro traffic uses road haulage to get to and from the port gate. Road haulage is also important for Lo-Lo and some bulk goods where either the length of haul and/or volume of goods do not make rail an attractive option. A number of ports in the North have road access problems which cause congestion on

[89] Network Rail (2013) *Long Term Planning Process: Freight Market Study*

[90] DfT PORT 0203

the local road network, traffic noise and contribute to poor air quality relative to EU defined thresholds. Of note is the access to the Port of Liverpool along the A5036 and from the M57 and M58 at Switch Island. Access to the Port of Hull involves goods vehicles travelling through the centre of the city.

Opportunities

5.35 One of the benefits of HS2 is the release of capacity on the West Coast Main Line (WCML) south of Crewe. In terms of traffic volumes the WCML is the most important of the north-south main line routes. However, the challenge for the Port of Liverpool is to gain access to this released capacity. There are two alternative routes from Liverpool via Runcorn to the WCML at Weaver Junction and the Chat Moss route from Liverpool to the WCML at Newton-le-Willows. The former route does not have direct access to the Port of Liverpool. The latter route faces capacity constraints, as does (pre and post HS2) the section of WCML south of Newton-le-Willows to Crewe. Further work would need to be undertaken to develop value for money solutions to these constraints facing the Port of Liverpool and other Superport developments.

6 Cross Cutting Themes

Introduction

6.1 As we set out in Chapters 1 and 2 of this report, there is a strong consensus that for the North's economy to grow to meet its full potential – to use the phrase of the Chancellor, to create a Northern Powerhouse – there is a need to:

- Support the economics of agglomeration by increasing the effective labour markets of key clusters in the both the service and other sectors of the economy
- Deepen and extend the geographic scope of labour markets to move away from several markets focussed on a number of city regions towards a single functional economic area
- Support and facilitate the increasing volume of business to business interaction that a growing northern economy will generate and require
- Support international trade by enhancing access for goods and people to markets

6.2 The consequences of the North growing to meet its full potential will be:

- More people travelling to work, more of whom will be travelling over long distances than today
- Reflecting the targeted growth of knowledge intensive business sectors located in city centres, more people travelling to work in the centres of the North's core cities than do now
- Reflecting the targeted growth of service and other sectors outside city centres, a greater volume and more complex pattern of trip making elsewhere
- A greater number of people travelling between city regions for business purposes
- More people travelling for leisure and other purposes to city centres and between city regions – without a sea-change in the relationship between economic activity and travel this is simply a reflection of a more prosperous economy
- Greater movement of goods, both domestically and internationally
- A greater demand for air travel, both to support business and reflecting a more prosperous population

6.3 In the three previous chapters we have considered the transport opportunities and constraints facing the North by looking first in Chapter 3 at the principal networks that link the North's city regions, namely the national rail network and the Strategic Road Network. We then considered in Chapter 4 the road and public transport networks that are used by journeys to work within city regions, before turning in Chapter 5 to the networks used to access port and airport international gateways. However, while this categorisation is useful for looking at elements of the North's road and public transport networks and, as has been noted already in preceding chapters, actual trip making does not conform to this neat network classification.

6.4 Almost all journeys using the Strategic Road Network use the local road network at the origin and destination ends of the journey and so are affected by the level of service on these roads. The North's Strategic Road Network forms an integral part of city regions' commuter networks, as evidenced by the congestion that they experience in the peaks. Similarly, many longer distance rail trips use local road and public transport networks at one or both ends of the journey. The Strategic Road Network is used by road freight, including that accessing ports and airports.

6.5 As well as providing links between the centres of the North's Core Cities, the North's longer distance rail services, such as those operated by Trans Pennine Express, are an integral part of each city region's public transport network. They also provide rail access to Manchester Airport. The North's classic rail network is largely mixed-use with freight and passenger services operating over the same tracks.

6.6 In the future, HS2 will add to the connectivity between city regions in the North and from the North to international airports. It is the local road and public transport networks and the Strategic Road Network that will be used to access the proposed stations. The surrounding land-use developments that HS2 stations will encourage will also be accessed by the same networks. The benefits that HS2 will deliver are inextricably linked with the future of the transport networks that serve its stations.

Roads

6.7 The demand for travel on both the Strategic Road Network and locally controlled roads is forecast to grow. While the Highways Agency is investing heavily in Managed Motorways, eventually demand growth will outstrip the extra capacity that is released. This is anticipated to happen within 10 to 15 years. While there are some sizeable and extensive road programmes within the Strategic Economic Plans for the North, these are largely focussed on addressing known pinch points (that is addressing current problems) or opening up land for development. Even with all the planned investment, demand is forecast to grow faster than supply. The net result is that congestion will increase – its effects will be more intense and will be felt over a wider area.

6.8 At both a national and local level there is no appetite at the present time to pursue road user charging as a way of managing demand for road travel. Technology advancement leading to an increase in the effective capacity of the network still appears a distant prospect.

6.9 Looking across the North, the opportunities are therefore:

- Targeted enhancements to the Strategic Road Network and local road network to address the most significant pinch points
- Greater use of Urban Traffic Management and Control (UTMC) on locally controlled roads
- Creation of city region strategic road networks that are managed centrally within a city region on a day-to-day and subject to a consistent policy framework and investment strategy
- Application of the Highways Agency's management approaches over a wider area (e.g. in the North East)
- Integration of Highways Agency and local systems and coordinated day-to-day management of local and strategic networks.

6.10 In the stakeholder engagement undertaken to support this work, there was a warm welcome for the Highways Agency's move to a longer term planning framework and in particular, the development of a Road Investment Strategy. What stakeholders did observe though was that:

- To be most effective any medium term programme needs to be set in the context of a longer term strategy, as is promised for the Roads Investment Strategy[91]
- They would like to see the Highways Agency's medium term programmes and in the future, longer term strategy to be more reflective, and more supportive, of locally-derived plans and programmes

Rail

6.11 Like the rest of the national rail network, rail in the North has experienced a significant increase in patronage over the last two decades and now experiences the negative consequences of this, on-train crowding for example. The North's rail network will experience substantial investment during Control Period 5 and as well as addressing some of these consequences on some routes, this will lead to connectivity enhancements for city to city movements, for commuter networks, to access Manchester Airport and for freight traffic, each of which will support the growth of the economy. However, demand is forecast to continue to grow and if this is to be accommodated further, investment to increase network capacity, enhance capability and reduce journey times will be needed beyond Control Period 5.

6.12 Through the high passenger capacity it can provide, rail has a central role to play in facilitating the sustainable growth of town and city centres. Rail is well suited to support the growth in labour markets and the longer commuting distances that this will require. While rail in the North already has a competitive advantage over the car for some city centre to city centre movements, for others it is comparatively slow and trains and infrequent.

6.13 Working collaboratively as Rail North, local authorities across the North have set out a Long Term Rail Strategy which identifies the conditional outputs for the classic network that Rail North considers need to be met if rail is to make the fullest possible contribution to supporting the North realise its future economic potential. Rail North has set an ambitious goal of doubling rail's mode share in the North. Through the One North initiative the five northern Core City city regions along with Hull have set in motion thinking about developing rail beyond the bounds of the established network.

6.14 The next step must be to integrate the thinking from Rail North and One North with the national rail strategic planning process so that within the context of a longer term plan the investment programmes for Control Period 6 take forward the implementation of the network enhancements that the North needs. Central to this needs to be exploiting the complementarity of city region metro/light rail and bus networks and integration of rail planning and scheme implementation with the enhancement of local networks and land use developments, as well as the further integration of ticketing and information provision.

6.15 The North's passenger rail network is heavily subsidised. There is a Government commitment to reduce the net subsidy paid nationally to rail franchises. As well as enhancing connectivity and providing sufficient capacity to accommodate demand, capital investment that reduces unit operating costs (e.g. electrification) is one way of supporting a reduction in subsidy. Similarly capital investment that supports further growth in passenger numbers will support

[91] DfT (2014) *Setting the Road Investment Strategy: Now and in the Future*

an increase in revenue. However, such investments can result in an increase in overall operating costs which exceed revenue growth, if only for the short term. If the twin goals of reducing subsidy and supporting growth are to be met, it will be important that when investment decisions are made appropriate time horizons are considered.

6.16 During the stakeholder engagement process, a number of stakeholders identified that joint promotion of enhancements with Network Rail is a costly business, both in terms of their own staff time and Network Rail's charges. It was suggested that a more collaborative approach could lead to mutual efficiencies as well as the earlier delivery of enhancements.

Integration

6.17 Throughout this report and for ease of exposition, we have tended to consider the North's transport networks in isolation - be these road or public transport networks. This, however, can over-look the potential benefit that can come about from further integration in the planning, operation and day-to-day management of public transport modes, public transport and the highway network, and locally-managed roads and the Strategic Road Network.

6.18 Already the Combined Authorities in the North's Core Cities provide printed and on-line information for bus, metro/light rail and rail services in their areas. They host real-time information systems for buses. They provide multi-modal and multi-operator ticketing products and are promoting implementation of smart ticketing. There is more that could be achieved in terms of provision of information, ticketing products, smart ticketing and coordination of services. This is particularly important at major interchanges where large numbers of travellers are seeking onward transit to their ultimate destination, and where there is the greatest proportion of longer-distance travellers, many of whom will be unfamiliar with local transport networks.

6.19 There are, however, barriers that have to be overcome to realise these benefits. The deregulated environment in which bus services operate in the North can be a barrier to bus service integration in terms of timetables, ticketing and fares. The Sheffield Bus Quality Partnership case study in Chapter 4 set out one way that these can be overcome and authorities elsewhere are going further by exploring Quality Contracts. Currently neither the Trans Pennine Express nor Northern Rail franchises have obligations to introduce smart ticketing. While it is anticipated that the new franchises which will start in April 2016 will include the provision of smart tickets, it is not yet clear how Combined Authority products will be accommodated.

6.20 There are potential gains to be had through clock-face standard hour rail timetables which increase the legibility of the network to users. Rail North's *Long Term Rail Strategy* identifies that just 1 in 8 rail journeys in the North involve interchange and that the current timetabled and operational practices act as a deterrent to journeys that involve interchange. However, with a railway that in key locations is operating at or close to capacity and where operations are optimised on a route-by-route basis, there are limits to what can be achieved without the provision of additional network capacity and changes to planning practice. Any coordination of bus and rail timetables tends to require unilateral action by the bus operator.

6.21 Park and ride offers an opportunity to integrate public transport provision, be it bus, light rail/metro and rail with local roads and the Strategic Road Network. Provision of park and ride access has the potential to increase traffic flows in the immediate vicinity of the park and ride site and this require a balance to struck between local impacts and strategic benefit.

6.22 The potential for greater integration of the day-to-day management of the Strategic Road Network and local roads has already been identified in Chapter 4.

Planning

6.23 Each of the five northern Core City city regions now has a Combined Authority and these provide an institutional framework for local authorities within a city region to work together and with their Local Enterprise Partnership. Combined Authorities can increase institutional capability and capacity, although it is also clear that there is not currently a consistent capability and capacity across the North. In some respects this is to be anticipated as each Combined Authority is different in terms of its make-up, the areas that they serve and past and current policy focus. Some local authorities across the North have experienced substantial reductions in their revenue budgets and staff complements and this has had a consequent impact on their capacity and capability to develop and implement policies, plans and programmes.

6.24 While each Core City city region has produced a Strategic Economic Plan, it is not the case that they have been produced with a shared set of planning assumptions or a common planning horizon. In part this is because of the nature of SEPs in that they are intended to have a deliberately competitive element[92], both for the associated Regional Growth Funding and for the rewards (jobs, economic growth, etc.) that come from their plan. Also, by their nature the SEPs have a short to medium term perspective. Because of this, however, it is also not clear that there is no potentially wasteful duplication between the SEPs and where there can be complementarity between the programmes of the respective SEPs that this is being exploited to the full. Consequently, it is not clear that the outcomes of these programmes (e.g. jobs/GVA) are being maximised.

6.25 From the transport perspective and, as this report has shown, the transport networks across the North cannot be considered in isolation and so neither can the strategies for their management, maintenance and enhancement. In addition, there is a need to take a longer term view – say 20 to 30 years. Through initiatives such as Rail North and One North, northern authorities have recognised the benefits of collaborative working across city regions looking over longer term time horizons. There are opportunities to extend the scope and scale of such collaboration to ensure that each city region is pursuing plans and programmes that are complementary, while at the same time making the most from their comparative advantages. A pan-northern view on the trajectory for the North's economy, as well as its population and employment may be helpful. Collaborative challenges do remain, however: once strategies have been agreed, the next task is to agree a prioritised programme. In some Combined Authority areas, there remains an unwillingness to pool local authority functions and make full use of the powers and freedoms that a Combined Authority can have.

Sustainability

6.26 The focus of this report has been on how transport can support the economic growth of the North and the constraints and opportunities that are faced. Cross-cutting all of the connectivity needs that have been considered is the need to consider environmental sustainability. Already the North's town and city centres face air quality problems and transport emissions are the most significant contributor to these. There is a need for the

[92] The Regional Growth Fund was allocated with regard to the submitted Strategic Economic Plans rather than by formula as was the previous system of devolved major scheme funding.

transport sector to contribute to the nation's obligations to reduce carbon emissions. Returning to the economic perspective, the long term prospects for North's economy are not well served by losing sight of these issues.

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