

**National Infrastructure
Commission
Call for Evidence**

MWH UK Evidence

**Connecting
Northern Cities**

To what extent are weaknesses in transport connectivity holding back northern city regions (specifically in terms of jobs, enterprise creation and growth, and housing)?

Lost potential due to poor Northern transport connectivity

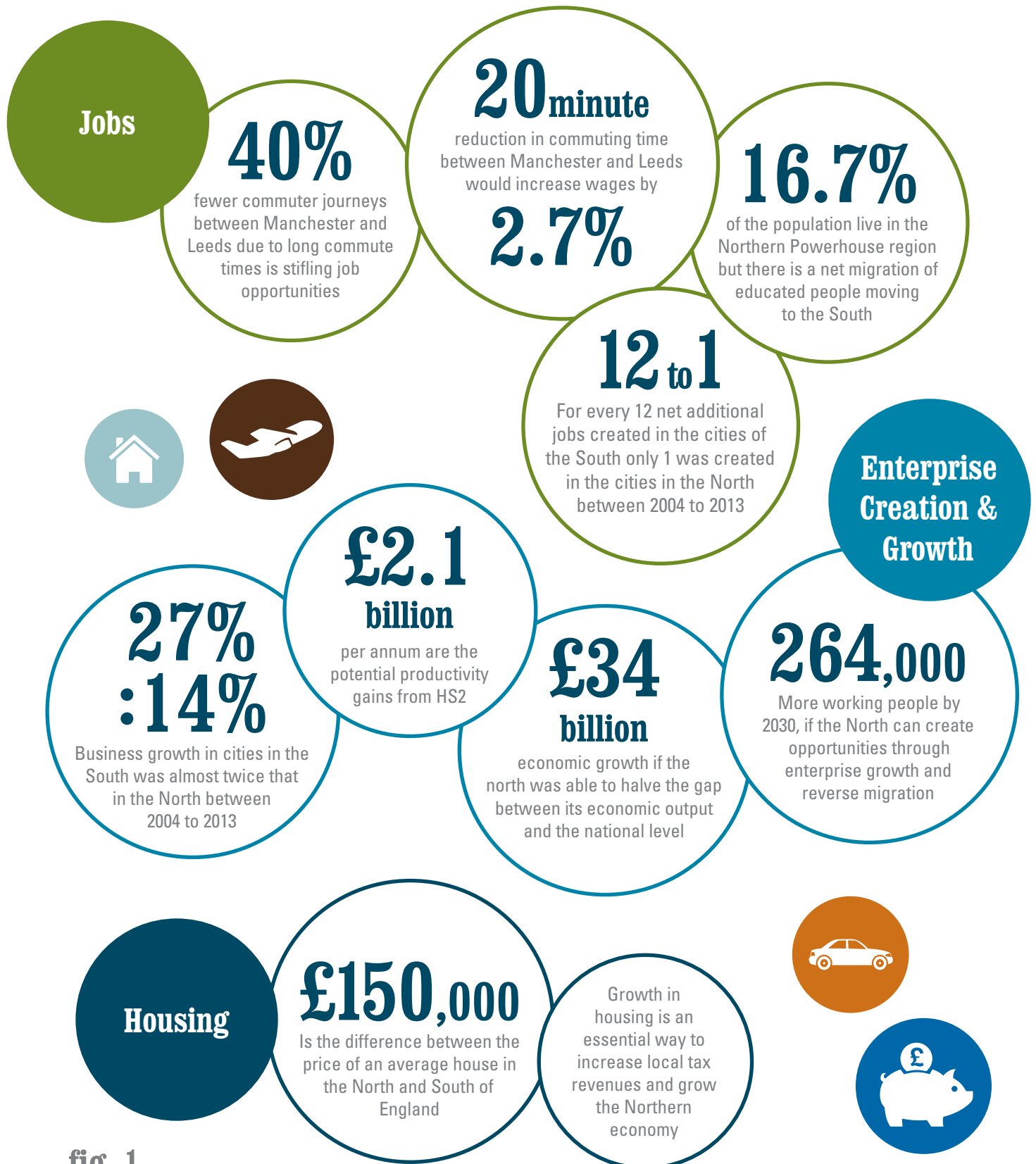


fig. 1

Poor transport links are sapping the productivity of the North

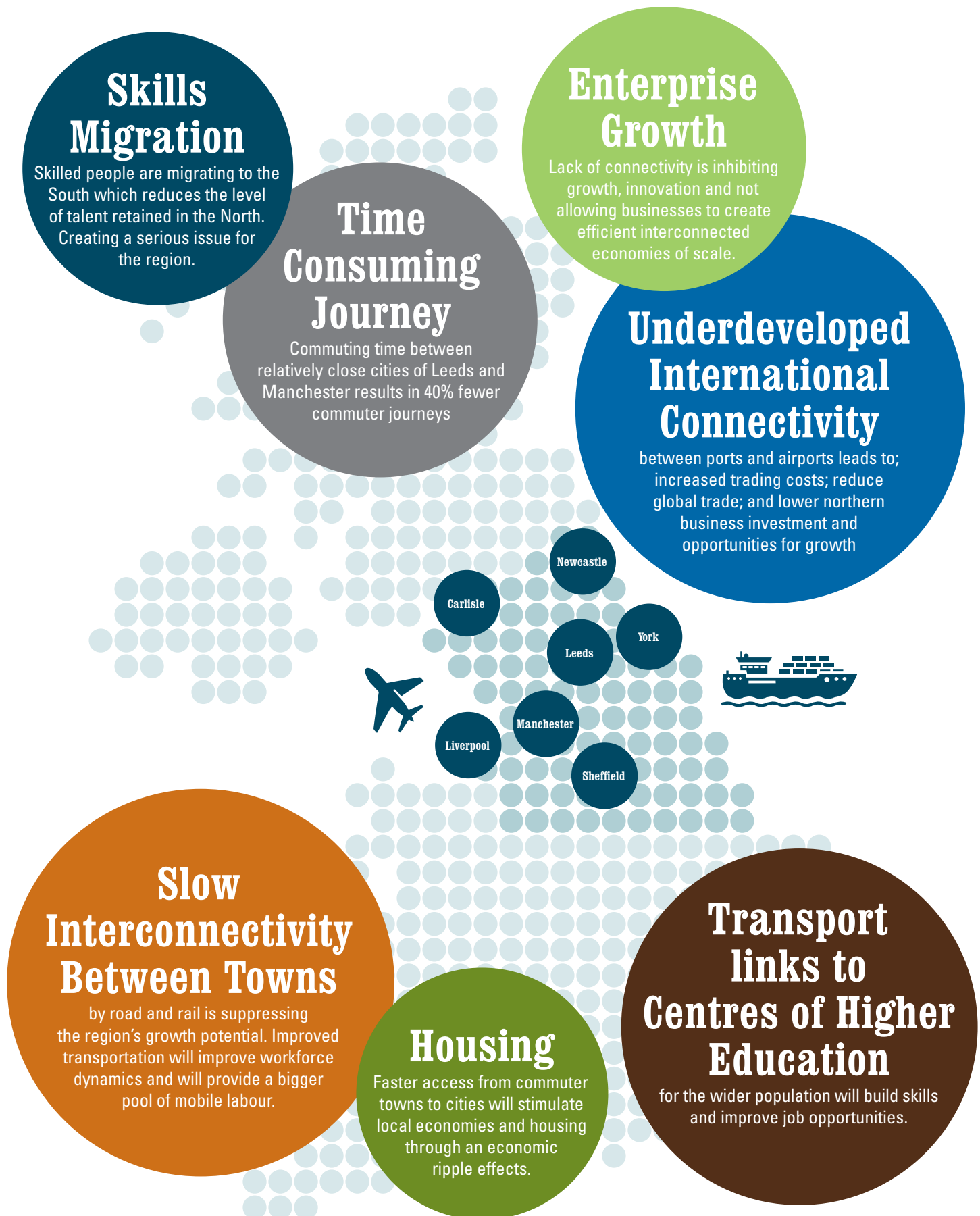


fig. 2

What cost effective infrastructure investments in city to city connectivity could address these weaknesses? We are interested in all modes of transport.



Cost effective road infrastructure investment

A multi-modal approach is needed for both logistical and personal travel that seamlessly joins up the road and rail networks. The main means of travel today is by road and the Northern highway network cannot meet the burden of expected growth. The rail network is extensive across the North, yet it fails to offer a sense of a joined up network (in the way that London Underground does). A multi – modal investment model will therefore ensure that the North's economy will become more productive, more competitive and more efficient as it competes in global markets. Much of the Northern road and rail infrastructure needs huge and long term investment; however there are cost effective upgrades that quickly improve the Northern network infrastructure as follows:



Use of motorways at night

The infrastructure is already there, all that is needed is to make better use of it. The USA and India have adopted a system to encourage hauliers to use motorways in the non-peak hours, to take the load off the roads in peak hours. For example:

- i. Deliveries are restricted to non-peak daytime or night-time hours
- ii. Incentivising haulage companies and businesses through reduced tax and licence fees during non-peak periods
- iii. Prohibiting use of motorways for business deliveries during peak periods.

This would reduce both motorway and city day time congestion and speed up commuter journey times.



Devolution for decision makers (PTEs) for faster journey times

A combined strategy to make it easier for people to commute between northern towns and cities. Devolution of transport decision making to the Public Transport Executives (PTEs) will enable fully integrated transport plans across the Northern region. Integrating train timetables to the timetables, and routes, of Metros and buses will create faster and easier routes to cover end-to-end town to city journeys.



Digitization: Creating a smart ticket infrastructure and smart integrated ticketing system

Linking Northern towns and city transport networks using contactless debit cards and payments through mobile phones. Using Big Data to track the movement of people, knowing how many people are scheduling particular routes and being able to adjust the number of buses and trains to match demand. Hence making travel by public transport hassle free which will encourage people to leave their cars at home. Digital technology has brought us smart phones, real-time planning, open traffic data, and social customer service. For the first time the passenger has as much information as the operator. Transport operators will need to adapt quickly in order to intelligently integrate joined up passenger journeys, in order to provide better customer service and a better, more sustainable transport system for the future.



Creating underground car parks in town/cities centres next to metro stations

In many European cities public parks and spaces such as cities squares and large roundabouts have been excavated to create deep underground car park. The parks, squares and roundabouts are reinstated giving much needed car parking space outside of congested city centres. These car park are often adjacent to metro stations and cycle paths and city bus routes.



Local 'Green Ribbon' corridors and expressways from towns to cities

Proper funding for sustainable transport with an active travel fund for more walking and cycling. 'Green Ribbon' corridors for cyclists, pedestrians and electric buses and the development of a Northern Region Cycle and Walkway only strategy to develop these green routes through the heart of Northern cities and towns. These will be linked to trains and buses that have designated spaces for bikes and stations and bus stops with designated bike storage areas. Many Northern cities are interconnected with canals and waterways. Cycle paths along these existing routes can create fast access into city centres and which avoid congested road networks.



City bikes for rent

Following the example of London, Barcelona and many European cities, having a network of rental bikes placed in strategic stations around cities will provide benefits to the environment, to the well-being of the people using them, potentially reduce congestion and potentially increase the accessibility and speed of travel through inner cities.



Postal and grocery delivery by drones

Singapore and Switzerland have tried this technology and there have been postal-delivery-by-drone trials conducted by DHL in Germany. However, this is an emerging technology and may be some time before drones become a regular sight in the sky. Potentially drone delivery is faster and can reduce congestion, is pollution free and reduces carbon footprint.



Cost effective, short and medium term highway and rail improvements

A number of recent studies have outlined cost effective road and rail improvements that can be delivered in the short and medium term, these are:

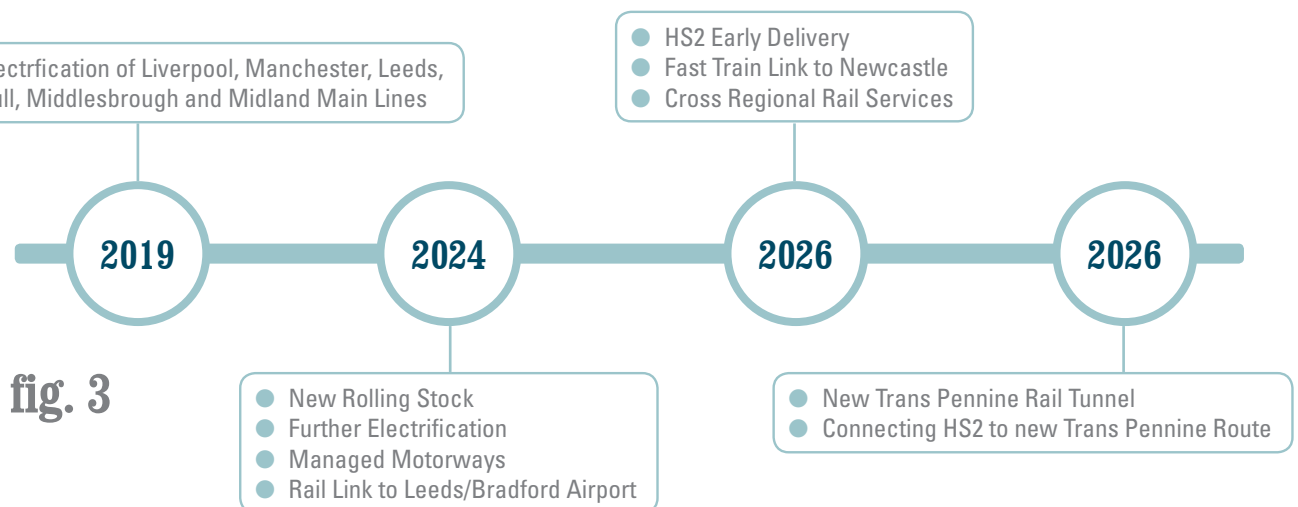


fig. 3



Better connectivity to towns through 'London Underground' thinking

Creating a transport policy which agglomerates business and industry with good quality housing and education: The focus of the government on core 5 cities might hold back the full growth potential of Northern Powerhouse. Smaller towns and cities are a crucial part of the northern powerhouse and can help drive the region's growth, providing they share in the benefits of new powers and prosperity. Better connection with towns through rail and road could provide the North with improved workforce dynamics as it would have a bigger pool of labour, improved university access to a wider population and hence greater number of educated people. Better Northern town connections will help stagnated northern towns to grow and prosper.

Which City to City Corridors should be the priority for early phases of investment?

The Northern Grid – Enterprise Corridors

Investing in a 'Northern Grid' of city to city infrastructure corridors, along which runs high speed rail and free flowing, decongested motorway links, will enable the Northern region to grow to its full economic potential and provide a massive rise in career opportunities for people living in the region. The proposed 'grid' will connect to the 'Y' shaped HS2 and create South to North and West to East corridors. These will link the major Northern cities of Liverpool, Manchester, Leeds, Hull across the country. Sheffield, Leeds, York, Middlesbrough and Newcastle will be linked along the East Coast and Manchester, Preston and Carlisle will be linked up the West Coast. These corridors will also link into the Northern ports and airports. It is proposed that each corridor is designated to be a linear enterprise zone, where planning regulations are relaxed in order to promote growth and business development.

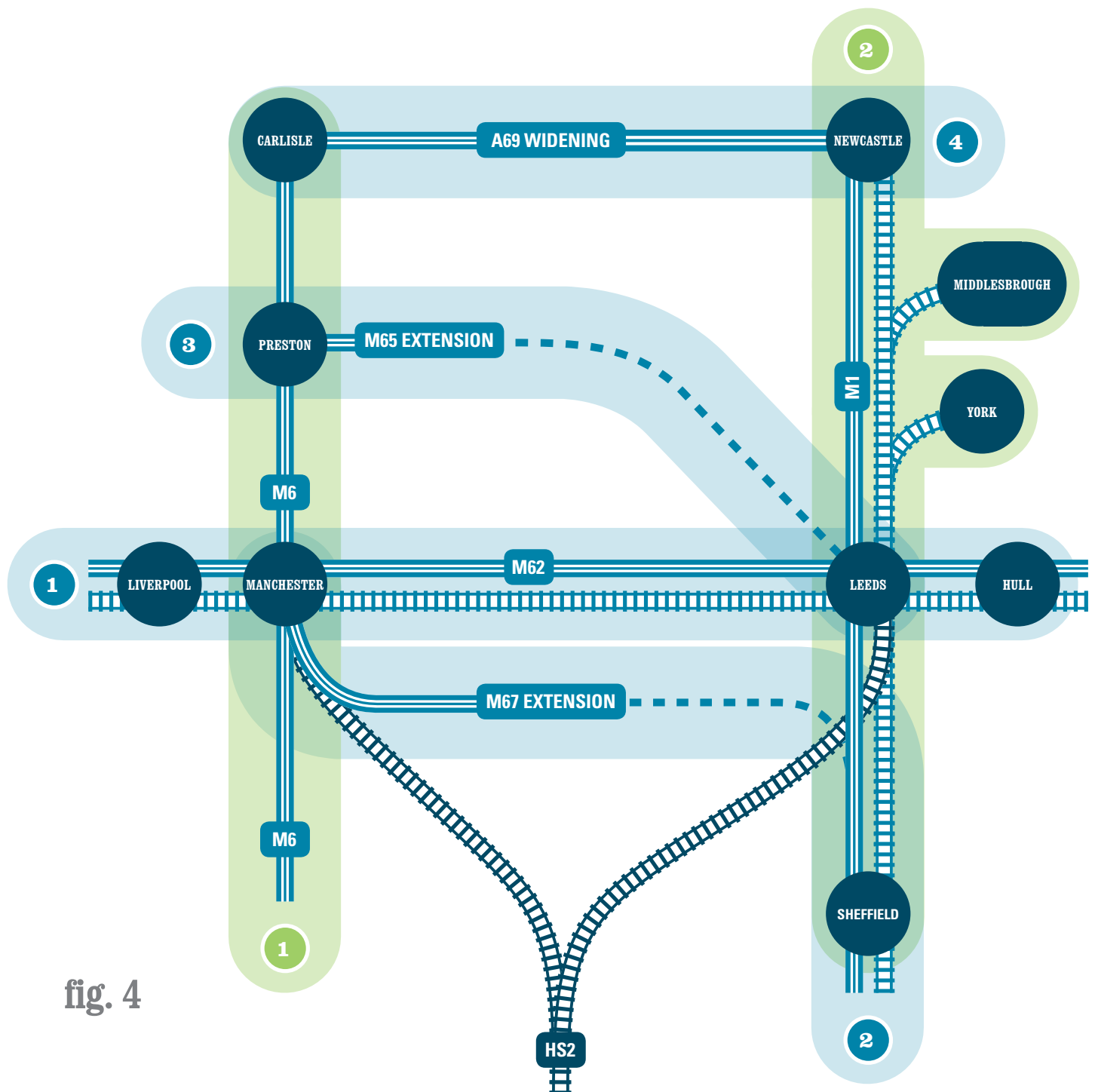


fig. 4

The West to East Grid Corridors

The diagram fig. 4 shows the potential to improve city to city connectivity in the north by creating a 'Northern Grid' of fast transport corridors that are connected to the HS2 rail network. From West to East there is potentially four corridors:



Trans Pennine Corridor that connects Liverpool, Manchester, Leeds and Hull which includes:

- Improving the flow of the M62 motorway the traffic congestion 'black spots' around the Eccles Interchange, and the M61, M60 and M621 junctions
- A new 125mph Trans- Pennine intercity rail tunnel that connects the 'Y' of HS2 underneath the Pennine and links the West to East ports of Liverpool and Hull.
- Improved existing town to city rail lines through electrification, new rolling stock and stations.
- Better inter-connection between city metros, buses and cycle transportation
- Enterprise zones around the ports of Liverpool and Hull and the airports of Manchester and Leeds- Bradford.
- Access to Manchester airport through M56 motorway and rail journey time improvements



Second Trans-Pennine motorway crossing connecting Manchester to Sheffield

- This proposal extends the existing M67 out of Manchester across to the M1, above Sheffield, to the East and also extends the M67 to the West to meet the Liverpool bound M62 underneath Manchester.



Extension of the M65 to connect Preston to Leeds-Bradford

- An extension of the M65 motorway to meet the M621 around Leeds/Bradford would vastly improve the motorway connectivity of the East Lancashire and the West Yorkshire industrial towns of Blackburn, Burnley, Halifax and Bradford.



Widening of the A69 dual carriageway to give a high level grid connection between Carlisle and Newcastle

- This would extend the Northern Grid at the top of the region. Giving better connectivity from the East Coast cities and ports of Newcastle and Middlesbrough.
- Expanding Newcastle airport with a surrounding enterprise zone
- Scheduled commuter flights from Newcastle to Manchester for business travel

The South to North Grid Corridors

From South to North there are potentially two grid corridors:

1

MAN

PRE

CAR

The route along the M6 connecting Manchester, Preston and Carlisle including:

- Improving the West Coast rail network to link rail freight with HS2 from the South and extending this up the West Coast through Manchester, Preston to Carlisle.
- Motorway improvements to de-congest the M6 approaching Manchester and Blackpool

2

SHF

LDS

YRK

NCL

MBR

The route along the M1 connecting Sheffield, Leeds, York, Newcastle and Middlesbrough including:

- Reducing train times between Sheffield, Leeds and Newcastle
- Improving the A1
- Expanding Leeds-Bradford airport, Robin Hood Airport and Newcastle Airport
- Light railway connection from Leeds to Leeds-Bradford airport
- Creating enterprise zones around the airports and ports
- Linking HS2 at Leeds with the East coast ports.

Question 4

What are the key inter-connectivity needs likely to be in the next 20-30 years in the North (focus on ports and airports). What is the most effective way to meet these needs and what constraints on delivery are anticipated?

Key International Connectivity Needs in the North in the next 20- 30 Years

Better road/rail connectivity to northern ports and airports is of strategic importance as it will significantly enhance the growth and the speed to transport goods and people. Underinvestment in international connectivity, through the northern airports and ports comes with a huge cost to the development of trade.

There has been a decline in the use of northern ports but they offer huge potential in helping the North become an economic powerhouse. The benefit brought from the development of northern ports are a more efficient and cost effective supply chain with better distribution networks for business. Investment in the existing Northern ports of Liverpool, Manchester, Heysham, Grimsby, Goole, Hull, and ports on the Tees and Tyne will underpin the North's ability to be the supply chain hub for the UK.

Having globally competitive airports is essential to ensure that people and goods can get to/from international locations quickly and at the right price. The main Northern region airport is Manchester; however, there are smaller city airports at Blackpool, Leeds-Bradford, Robin Hood (Doncaster-Sheffield) and Newcastle that have grown significantly during the last decade, mainly through personal travel. Expanding one of these airports for international trade (say either Leeds-Bradford or Newcastle) to the same scale as Manchester Airport and linking this expansion to the 'Northern Infrastructure Grid' will bring massive growth opportunities to the North. For example, Manchester Airport City is the largest real estate project likely to come forward in the North over the next decade. Replicating this and improving connectivity to and from other regional airports offers a significant growth strategy for the North.



fig. 5

Airports - Effective Ways to meet needs

Investment in better infrastructure connectivity, via rail and metros from city centres and freight routes to ports, to airports will improve access to international markets and bring economic growth.

The North has growing regional airports with Newcastle, Liverpool and Leeds Bradford each handling over 3 million passengers per year. Growing airports in the North and expanding the number of routes they are able to offer is a key consideration. Newcastle is connected by the Tyne & Wear Metro and Liverpool via Liverpool South Parkway rail station. Further recommendations are as follows:

- A rail connection from Leeds to Leeds Bradford airport
- The Manchester Airport Group development plan to 2030 is already in progress. The recommendation is better road and rail access, particularly improvements to the M56 motorway and improved journey time and frequency of trains to other northern cities. The scope to grow airport will increasingly become constrained by road network capacity and there is a need for enhanced rail connectivity (especially in an east-west direction), light rail connectivity and direct cross city services to, what is, the North's principal international gateway airport.
- Another growth area highlighted in the Manchester Airports Groups plan is the launch of the £130 million 'China Cluster' at Airport City with the aim to lure Far East firms to Airport City. It will provide a commercial base for Chinese businesses arriving in the UK and offering a wide range of high quality office premises.
- Robin Hood Airport Doncaster Sheffield, which is the international gateway to Sheffield City Region for passengers and is part of the Sheffield City Region logistics hub. Over £113m is currently being invested via RGF and the Sheffield City Region Growth Deal to improve its surface connectivity which will increase passenger numbers, and hence heighten its strategic significance

Ports – Effective Ways to Meet Needs

Ports and distribution centres are mostly owned and operated by the private sector while highway and rail networks are publicly funded. The Port investment strategy focusses on better transport access to ports and growth in trade from the major northern ports into the business marketplace. The links to ports are extremely important for growth and add a substantial proportion to the GVA of the cities. The current condition and links to ports are weak and recommended effective improvements are as follows:

- Better links between the Humber ports and the rest of UK is critical for Northern regional growth. This is a major hub for bulk cargoes, pharmaceuticals and offshore, worth over £26bn to the national economy every year. However, links to and from the Humber are sub-standard and better road and rail connectivity through the 'Northern Grid' of transport corridors is essential.
- The development of Liverpool SuperPort plans which will bring a post panama capacity and the potential for rapid expansion in containerised goods
- The North of England has 14m m2 of large warehouses. This stock is concentrated along the M62 corridor on both sides of the Pennines, in South Yorkshire, where the M18 provides important connectivity to the expanding logistics sector in Doncaster, and in the major ports. Within the North of England, the M62 plays a particularly important role. Freight accounts for about 40% of traffic on this key Trans-Pennine route. A new 125mph freight rail link will substantially increase connectivity and economic benefits.
- The Atlantic Gateway initiative, spanning of Greater Manchester, the Liverpool City Region and Cheshire and Warrington, is a collection of assets including transport infrastructures that, via their cross-boundary combination, already represents an opportunity for growth. This includes the strategic road and rail network as well as canal infrastructures, access to the Port of Liverpool as a priority, and logistics assets in each of the three sub-regional areas on sites at which jobs can be created.
- There are significant investments being made in the northern ports and it is essential that infrastructure connectivity keeps pace with these developments, for example: Peel Ports £350 million in the Port of Liverpool creating Liverpool2; Siemens who are investing £160 million to build a wind turbine factory and with Associated British Ports who are investing £150 million into the Port of Hull; Able UK who are investing over £450 million in an 850 hectare Logistics and Marine Energy Park on the South Humber Bank; Port of Tyne who plan to invest £180 million in a redevelopment scheme, including a new wood pellet handling and storage facility; Teesport who plan to develop the Northern Gateway Container Terminal; and developers of inland ports and multi-modal distribution centres, such as the port in Doncaster, Goole, Port Salford and Trafford Park to maximise the efficiency of the Northern distribution network.

What form of governance would most effectively deliver transformative infrastructure in the north, how should this be funded and by whom, including appropriate local contributors?

A report by McKinsey: 'Building Inclusive cities and Sustaining Economic Growth', states that, 'the most successful governance is a devolved model that empowers local leaders but holds them accountable'. Examples of this working in practice are:

- South Africa consolidated previously independent municipalities of Johannesburg into a single metropolitan government under a mayor supported by a professional city manager.
- China's major cities have powerful political appointees as mayors and use focused SPVs, as in the case of Shanghai's water supply, to build and run the urban infrastructure.
- The directly elected mayor of London sets policies and executes operations through corporatized agencies such as Transport for London.

To give the Northern cities more power over their economic destinies, it is essential the power to make major economic development decisions is transferred from Whitehall and from unelected quangos. A series of bold steps are needed to give more power and financial devolution to the biggest northern city-regions.

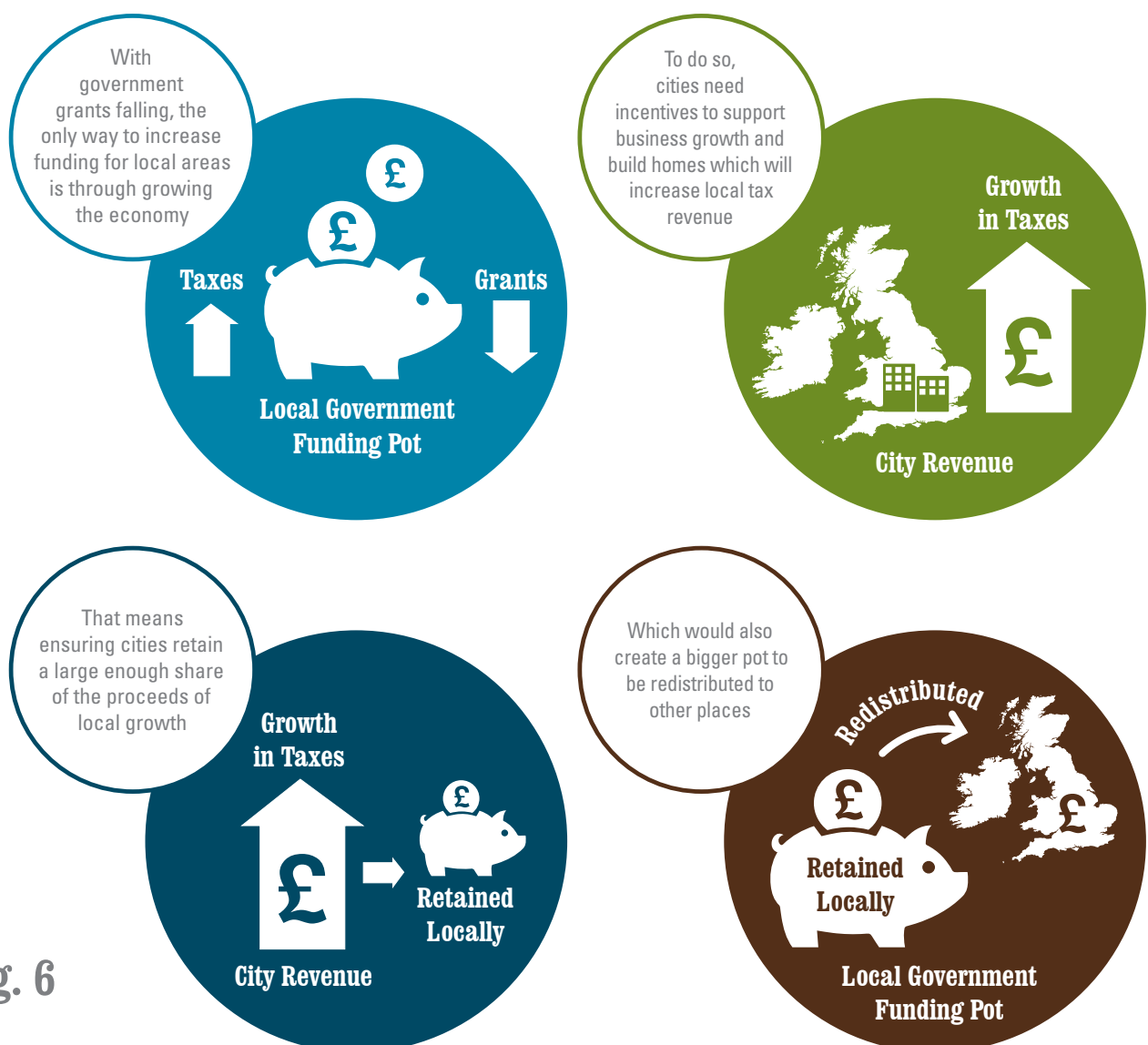


fig. 6

Proposed Governance Structure for the Northern Powerhouse

The governance structure proposed, and in some places being implemented, is that of devolution of powers to the city mayor. The Government's commitment to devolve significant transport powers to mayor-led city regions across the North, including the deals already agreed with Greater Manchester and proposed with Sheffield, the North East, Tees Valley, and Liverpool City Region – together representing more than half of the northern economy. Through these deals the Government has committed more than £4 billion of additional funding to these city regions over the next 30 years to be invested in local priorities, including transport.

A governance structure that would most effectively deliver transformative infrastructure for the North will include the following:

- i. Devolved real power to northern cities including linked metropolitan urban agglomerations
- ii. Directly elected (London style) mayors who have ultimate responsibility for strategic infrastructure development throughout the North.
- iii. Elected leads (from each of the mayors) to lead and join up infrastructure strategies and transport policy across the whole of the Northern region i.e one joined up plan.
- iv. Modernised public sector service delivery structures, that include private sector participation
- v. Recruitment of talented leaders from the private sector

How Should Transformative Infrastructure to the North be Funded?

In developed countries, governments have created transparent, formula based mechanisms to fund their cities, in the UK, 70-80% of city revenues have come from central government grants. With government grants falling, the only way to increase funding in the Northern region is through growing the economy. To do this, cities need to provide incentives to support business growth. They also need to build homes which increases local tax revenues. Financial devolution will allow cities to retain a larger share of the proceeds of local growth and which will provide a bigger pot to channel into infrastructure development and other strategic growth areas.

Particular to infrastructure, specially rail and roads, traditional UK funding has been mostly dependent on government investment/spending and more recently PPP model.

Airports and ports have been more reliant on private investment using the PFI model.

Examples of funding models for infrastructure project delivery are:

- Shared investment models or public private partnerships (PPP), i.e., using private sector capacity and public resources in order to deliver public sector infrastructure.
- Internal revenue generation through raising funds from leasing city land banks
- External sources and leveraging debt/equity, privatisation and loan mechanisms
- Design build, design-build-operate and maintain, and higher-risk concession arrangements such as build-own-operate transfer funding models.
- Public shareholding, crowd funding/crowdsourcing are some example of funding models considered for various forms of construction.

Crowd Funding is a new form of infrastructure funding which has been tried on a few projects in California. This has been achieved through the issue of MUNI bonds have served as a mechanism to encourage citizens to invest in local infrastructure.

In UK itself there have been crowd funding investments in the public architecture. Examples of such projects are Thames Baths project, which raised over £140,000 on Kick-starter in a just a few weeks which inspired the upcoming Thames Deckway floating cycle path proposal in London, by River Cycleway Consortium Ltd. Besides generating money, the crowd funding campaign established a global network of people who believed in the project and wanted to help make it happen.