



RAIL NEEDS ASSESSMENT FOR THE MIDLANDS AND THE NORTH

Interim report

NATIONAL
INFRASTRUCTURE
COMMISSION

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The Commission

The Commission's remit

The Commission provides the government with impartial, expert advice on major long term infrastructure challenges. Its remit covers all sectors of economic infrastructure: energy, transport, water and wastewater (drainage and sewerage), waste, flood risk management and digital communications. While the Commission considers the potential interactions between its infrastructure recommendations and housing supply, housing itself is not in its remit. Also out of the scope of the Commission are social infrastructure, such as schools, hospitals or prisons, agriculture, and land use.

The Commission's objectives are to support sustainable economic growth across all regions of the UK, improve competitiveness, and improve quality of life.

The Commission delivers the following core pieces of work:

- a *National Infrastructure Assessment* once in every Parliament, setting out the Commission's assessment of long term infrastructure needs with recommendations to the government
- specific studies on pressing infrastructure challenges as set by the government, taking into account the views of the Commission and stakeholders, including recommendations to government
- an *Annual Monitoring Report*, taking stock of the government's progress in areas where it has committed to taking forward recommendations of the Commission.

While the Commission is required to carry out its work in accordance with the remit and the terms of reference for specific studies, in all other respects the Commission has complete discretion to determine independently its work programme, methodologies and recommendations, as well as the content of its reports and public statements.

The Commission's binding fiscal remit requires it to demonstrate that all its recommendations for economic infrastructure are consistent with, and set out how they can be accommodated within, gross public investment in economic infrastructure of between 1.0 per cent and 1.2 per cent of gross domestic product each year between 2020 and 2050. The Commission's reports must also include a transparent assessment of the impact on costs to businesses, consumers, government, public bodies and other end users of infrastructure that would arise from implementing the recommendations.

When making its recommendations, the Commission is required to take into account both the role of the economic regulators in regulating infrastructure providers, and the government's legal obligations, such as carbon emissions reduction targets or making assessments of environmental impacts. The Commission's remit letter also states that the Commission must ensure its recommendations do not reopen decision making processes where programmes and work have been decided by the government or will be decided in the immediate future.

The Commission's remit extends to economic infrastructure within the UK government's competence and will evolve in line with devolution settlements. This means the Commission has a role in relation to non devolved UK government infrastructure responsibilities in Scotland, Wales and Northern Ireland (and all sectors in England).

The Infrastructure and Projects Authority (IPA), a separate body, is responsible for ensuring the long term planning carried out by the Commission is translated into successful project delivery, once the plans have been endorsed by government.

The Commission's members

Sir John Armitt CBE (Chair) published an independent review on long term infrastructure planning in the UK in September 2013, which resulted in the National Infrastructure Commission. Sir John is the Chair of National Express Group and the City & Guilds Group. He also sits on the boards of the Berkeley Group and Expo 2020.

Professor Sir Tim Besley CBE is School Professor of Economics and Political Science and W. Arthur Lewis Professor of Development Economics at the LSE. He served as an external member of the Bank of England Monetary Policy Committee from 2006 to 2009.

Professor David Fisk CB is the Director of the Laing O'Rourke Centre for Systems Engineering and Innovation Research at Imperial College London. He has served as Chief Scientist across several government departments including those for environment and transport, and as a member of the Gas and Electricity Markets Authority.

Andy Green CBE holds several Chair, Non-Executive Director and advisory roles, linked by his passion for how technology transforms business and our daily lives. He chairs Lowell, a major European credit management company and has served as Chair of the Digital Catapult, an initiative to help grow the UK's digital economy.

Bridget Rosewell CBE is a director, policy maker and economist. She served as Chief Economic Adviser to the Greater London Authority from 2002 to 2012 and worked extensively on infrastructure business cases. She has served as a Non-executive Director of Network Rail and Non-executive Chair of the Driver and Vehicle Standards Agency. She is currently Chair of the Atom Bank and the M6 Toll Road.

Professor Sadie Morgan OBE is a founding director of the Stirling Prize winning architectural practice dRMM. She is also Chair of the Independent Design Panel for High Speed Two and one of the Mayor of London's Design Advocates. She sits on the boards of the Major Projects Association and Homes England.

Julia Prescott is a co-founder and Chief Strategy Officer of Meridiam and sits on the Executive Committee of Meridiam SAS. She has been involved in long term infrastructure development and investment in the UK, Europe, North America and Africa. Since 2019 she has sat on the board of the Port of Tyne.

Foreword

There are two important truths about railways. First, they are a means to an end. We build them to support connectivity between people and places, and to enable economic growth. Second, railways are often necessary but rarely sufficient to drive economic growth in advanced economies. Both these truths are central to the Commission's approach to assessing the rail needs of the Midlands and the North.



For as long as we can remember, the productivity of the Midlands and the North has been eclipsed by London and the South East. In part, this is attributed to the better connectivity in these areas, with the capital home to an urban transport network which is peerless among British cities. In contrast, the Midlands and the North can suffer from unreliable services and long journey times, causing frustration and hampering economic potential.

While improved transport links are only one part of the solution, the Commission has been asked to examine the rail needs of the Midlands and the North to help inform government's plans to reduce regional inequalities. There are a series of major strategic rail investments in the pipeline, alongside other interventions, that will seek to improve the experiences of the passengers who rely on rail for work and leisure. This interim report summarises the objectives, approach and methodology for the Rail Needs Assessment, which will inform the development of government's Integrated Rail Plan for the Midlands and the North.

The government's Integrated Rail Plan provides an opportunity to reimagine the links between some of our great cities in the Midlands and the North and create an enduring legacy. Realising this will require government to make strategic choices. While many of the major projects in the pipeline are long term, communities should be able to experience the benefits of improved transport links as soon as possible. Government will also need to work to deliver benefits from investments faster.

The Commission's work will be undertaken against the backdrop of the Covid-19 pandemic. This challenging period has sent shockwaves through the economy and carries a huge social burden. This context means that it is even more important for government to harness the power of infrastructure investment to support the recovery, where that is in the long term interests of citizens.

There is much speculation about the impact the pandemic will have on mobility. While we have seen a reduction in rail journeys and patterns may change in future, it is unlikely that the crisis will end the desire or need to travel within and between our cities and towns.

The Commission will investigate the existing needs of people and places, as well as understanding how future needs can best be met. To inform our analysis, we will continue to engage with a wide range of stakeholders, including, of course, the public.

The assessment will help to lay the foundations for a new era of British railways, which better connect people and places, and support economic growth alongside wider policies.

Sir John Armitt
Chair, National Infrastructure Commission

Executive summary

The UK needs to take the right decisions to deliver rail projects that maximise the benefits to the Midlands and the North over the long term. The number of people commuting by rail into cities in the Midlands and the North is growing, but journeys can be slow and unreliable. There are many proposals for improvements, including major strategic investments. The Integrated Rail Plan presents an opportunity for government to integrate these major proposals into one coherent, affordable plan. This assessment will support government to make strategic choices to best meet the rail needs of the Midlands and the North.

London and the South East are the only regions in the UK with productivity above the UK average. The Midlands and the North lag significantly behind. Improvements in rail infrastructure are necessary, but not sufficient, to transform economic outcomes in the Midlands and the North. Maximising the benefits of investments in rail will depend on other factors, including interventions to increase the level of skilled workers, and improvements to urban transport. However, rail connectivity and capacity can increase the ability to exploit such interventions and attract the firms with the capability to do so.

The ongoing Covid-19 outbreak, and its impact on the economy, means it is even more important that the government makes long term investments that can boost confidence and support the UK's economic recovery. While the outbreak has led to a, possibly temporary, reduction in journeys on the UK's rail network, there remains a need for long term funding for transformative public transport projects that reduce journey times and improve reliability between and within key economic centres, while meeting changing commuting patterns.

The government has asked the Commission to carry out an assessment of the rail needs of the Midlands and the North, to inform the development of the government's Integrated Rail Plan. This interim report sets out the Commission's objectives, approach and methodology for its assessment. The final report will set out an assessment of a menu of options for packages of proposals that are deliverable, affordable, and that accelerate and maximise benefits to the Midlands and the North.

The assessment

Following the Oakervee review of HS2 in February 2020, the government announced its intention to draw up an Integrated Rail Plan for the North and the Midlands, which will identify the most effective scoping, phasing and sequencing of relevant investments and how to integrate HS2, Northern Powerhouse Rail, Midlands Rail Hub and other proposed rail investments. This plan will be informed by the Commission's independent assessment of the rail needs of the Midlands and the North.

The Infrastructure and Projects Authority is conducting a review of the lessons learned from HS2 Phases 1 and 2a for the delivery of the rest of the project (including the effects of planning and consents process, engineering specification and procurement models on the costs of delivery), which will also feed into the government's plan.

The Commission has previously recommended investing in better rail in the North, particularly in High Speed North, the Commission's report on strategic improvements to transport connectivity in the North. However, the Commission has not previously considered HS2, as its remit excludes consideration of decisions that have already been made and spending that has already been committed, unless specifically requested.

The Commission's final assessment, which will be published in November 2020, will assess strategic rail proposals. The government has already taken decisions on HS2 Phases 1 and 2a, and therefore these schemes are out of scope of this review. This review will only look at major rail proposals, and therefore, while critically important, local transport, which the Commission made recommendations on in the *National Infrastructure Assessment*, will not be considered. The Commission will only consider proposals where plausible cost estimates and evidence on the impact of the proposal on journey time and capacity have been provided, although the Commission may also consider proposals where this information can be obtained or generated.

The scale of these proposals, both in terms of what needs to be built, and the affordability of building it, means that choices are likely to be necessary. Spreading investment thinly between as many places as possible will not address geographical variation in economic outcomes – investment needs to be concentrated to make a difference. Getting the sequencing right will also be important – both supply chain capacity and integration may well imply necessary sequencing of investments in both renewals of the existing network and new investments. A long term plan is essential to build confidence for investors. The Commission will set out options for packages of investments, assess the benefits of these against the Commission's objectives, and clarify the strategic choices between these for government.

The government has said that its Integrated Rail Plan will consider how best to integrate HS2 Phase 2b and wider transport plans in the North and Midlands, delivering benefits from investments more quickly. However, on current timelines, major rail proposals, including HS2 Phase 2b, may not be completed before 2040. It should not take 20 years to address problems that are already acute. The Commission will therefore consider options for:

- **accelerating delivery**, for example by speeding up approvals for construction to start, starting construction sooner, and completing it more quickly, with reference to the outcomes of the Infrastructure and Projects Authority's review of lessons learned from cost overruns on HS2 Phases 1 and 2a
- **getting the timing and mix of interventions right**, by considering how proposals can be sequenced to deliver benefits more quickly, for example by building the highest priority things first or making investments earlier to address known problems (where these also deliver long term benefits)
- **delivering confidence by agreeing plans**, by ensuring government takes the necessary strategic decisions to deliver confidence to investors, developers and local government to bring forward plans.

In this assessment, the Commission will work to understand both the needs of existing rail users and those of potential users of future services. Alongside its programme of analysis and stakeholder engagement, the Commission will conduct social research to explore which service improvements would most meet the needs of existing passengers and encourage infrequent rail users to use new services. The social research will also test the public's views on greater short term service disruption in exchange for faster delivery of improvement projects. The findings will be published alongside the final report.

Emerging findings from the Commission's initial stakeholder engagement process reinforce the Commission's proposed approach. Key themes from responses included:

- **prioritisation and sequencing** – the need to deliver major schemes earlier where possible, integrate major schemes, and address existing challenges on the network
- **local impact** – delivering capacity benefits and encouraging local investment
- **resilience and reliability** – including addressing bottlenecks
- **providing certainty** – to give businesses the confidence to invest and provide certainty to the supply chain
- **environmental impact** – ensuring that proposed interventions take account of potential impacts on natural capital and carbon emissions.

Rail and economic outcomes

Improving economic outcomes in the Midlands and the North is on agendas across the political spectrum. Regional variation in economic outcomes exists in other countries. But the extent of this appears to be unusually high in the UK, where few major cities, aside from London, have productivity above the national average. While all regions have areas that are doing better than others, there is a concentration of deprived areas within the Midlands and the North – the ten local authorities with the highest concentrations of deprived neighbourhoods are all in the Midlands or the North. There is no easy answer to address this.

Regional variation in economic outcomes is driven by a range of interacting factors. Highly skilled people and businesses tend to cluster together as they are more productive, and earn higher wages, when they do – an effect known as 'agglomeration'. Amenities, such as hospitality, entertainment and other services, also tend to concentrate in areas of highly paid people. This in turn attracts further highly skilled and paid workers, which raises property prices, and pushes out lower paid workers, who then seek places with lower rents or property prices, and cheaper shops and services, creating self-reinforcing cycles of success and deprivation. As the UK's economy has shifted towards business services, cities have tended to particularly benefit from these factors, leaving some smaller towns and rural areas behind.

Improvements to rail services have long been proposed as a way to boost economic growth in the Midlands and the North. The number of people commuting by rail into cities in the Midlands and the North is growing. Between 2010 and 2018, arrivals by rail during the morning peak increased 36 per cent in Manchester and 34 per cent in Birmingham.

However, rail journeys between major cities in the Midlands and the North tend to be slower than those in the south. Trains between Reading and London travel at almost 90 miles per hour, almost double the speed of trains between Manchester and Leeds, which have an average speed of 48 miles per hour. Even outside of London, trains between Bristol and Swindon travel at an average speed of 58 miles per hour, faster than most connections between northern cities. Train services in the North and the Midlands can also be unreliable, with services including Northern Trains, CrossCountry, TransPennine Express, and Hull Trains performing worse than the national average for trains arriving on time.

Rail can contribute toward supporting the growth of cities and nearby towns in the Midlands and the North. Rail can effectively move very large numbers of people in and out of city centres. This produces stronger agglomeration effects and provides increased access to amenities such as entertainment and services, supporting economic growth within city centres, and the nearby towns that people commute from. Rail can also offer faster journeys between city centres, increasing the market for firms in each city and allowing successful businesses to grow. And major rail investment in an area can encourage businesses to invest in that location.

But rail schemes alone are not a solution to delivering economic transformation. Successful interventions to move a place from a downward cycle to an upward one require a range of factors to be in place, including skilled employment and workers, local transport and public services. Other factors, such as the availability of good housing, schools, and amenities, low crime rates and good governance will also affect where people choose to live. Local decision making, and knowledge about specific circumstances, will also be important.

Methodology

To select options that maximise the benefits to the Midlands and the North, the Commission will consider major, strategic rail proposals that are within the scope of the review, and where sufficient information has been provided, or can be obtained or generated, for the proposal to be assessed. This will cover the scoping, phasing and sequencing of HS2 Phase 2b, Northern Powerhouse Rail and Midlands Engine Rail, as well as the redevelopment of Manchester Piccadilly, the Transpennine Route Upgrade, and improvements to existing lines (e.g. the East Coast Main Line). The Commission will sift all options suggested through the recent call for evidence and stakeholder engagement processes to identify those that will be considered in the assessment.

Government should not be presented with a choice between an obvious ‘best’ option that is unaffordable and less attractive but cheaper options. The Commission will therefore develop packages of rail proposals in the Midlands and the North with similar cost profiles between now and 2045. These will fall within one of three possible cost profiles, allowing for different levels of government spending on rail. These will be based on the Commission’s binding fiscal remit.

Rail has a history of overspends. Costs for the West Coast Main Line upgrade rose by almost £8 billion (2019-20 prices), and the Oakervee Review found that the HS2 project, as currently scoped, no longer falls within the existing funding envelope. To develop packages with realistic costs, the Commission will also be scrutinising the costs of each proposal and taking account of optimism bias.

The Commission has developed its own methodology to assess these packages. Existing approaches to assessing the impact of rail investments on economic growth, such as conventional cost benefit analysis, fail to fully capture the interactions between rail investments and other factors, such as skilled employment and urban development. This risks public investment in transport being channelled to areas that are already doing well, as the effects of transport in isolation are highest there. Alternatives to this approach often rely on complex models that try to capture interactions, but lack transparency.

The Commission's methodology instead aims to measure the potential of different packages to deliver economic benefits. It will also set out clearly what decision-makers would have to believe to think that this potential would be realised – for example, that other interventions in areas such as skills, governance and local transport are successful. The Commission's assessment will also focus on what rail is good at compared to other modes of transport: transporting people into dense city centres and providing high speed links between cities.

The assessment will focus on:

- **Economic growth and competitiveness** – including improving productivity through agglomeration, unlocking investment in land around stations, improving trade and connectivity between places in the Midlands and the North, with Scotland, and with the rest of the world
- **Sustainability and quality of life** – including increasing access to amenities such as hospitality, entertainment, and other services, improving reliability and assessing the lifecycle carbon emissions and impact on natural capital, including by considering the impact of freight on carbon emissions and congestion.

The assessment will consider how potential rail investments in the Midlands and the North would affect connectivity to Scotland, rather than the connectivity of Scotland with the rest of the UK. The Commission's assessment will take account of expected developments in transport in the coming years, including considering the decarbonisation of rail and other modes. The assessment will consider the impact of freight on carbon emissions in future, but also its impact on congestion on transport networks, including around international gateways such as Liverpool Port and Port of Tyne.

In the final report of this assessment, the Commission will set out the different options for packages, alongside an assessment of the potential benefits of each package. Each package will present a different set of potential benefits. Some may deliver greater benefits for economic growth and competitiveness, and some for sustainability and quality of life. Some packages may benefit certain areas more than others. The Commission will aim to clarify the strategic choices that government needs to make between proposals and help identify those that will maximise the benefits to the Midlands and the North. It will be for government to decide which of the options, or which combination of proposals, best meets the objectives of the Integrated Rail Plan.

Next steps

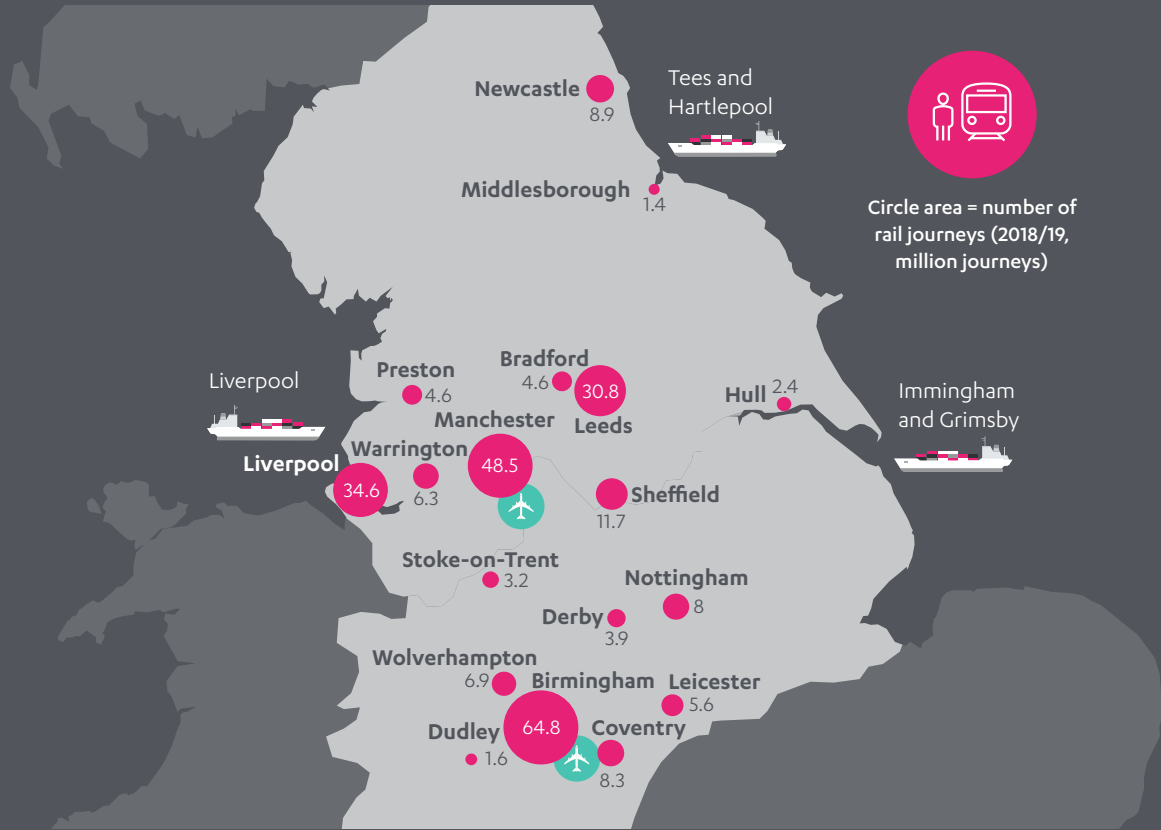
This report includes some questions on the proposed methodology, in Chapter 3. Chapter 4 sets out how to respond to these questions. The Commission will hold a series of roundtables, seminars and discussions with a range of stakeholders throughout the summer to gather views on its methodology and broader approach to the assessment and to test emerging conclusions. The final report, setting out an assessment of options for packages for investment in rail in the Midlands and the North, will be published in November.

Indicative rail journey flows in the Midlands and the North

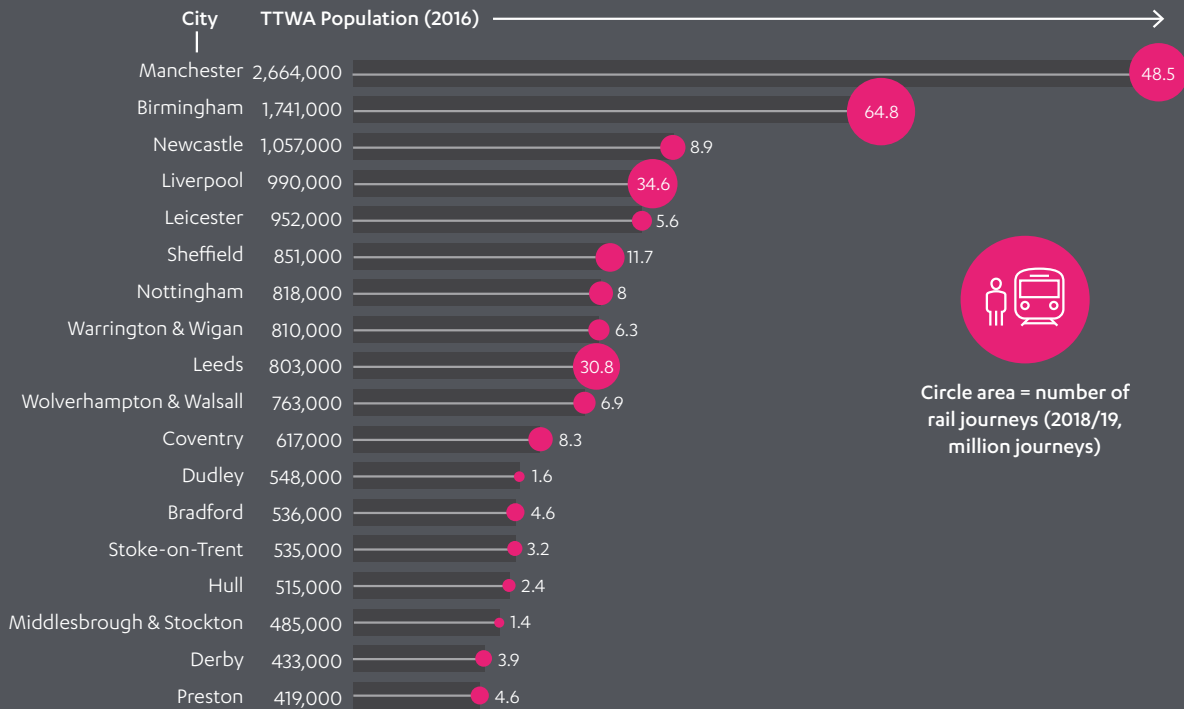


The pink arrows show indicative journey flows rather than specific routes. Places shown in the lighter grey area are Travel to Work Areas in the North and Midlands with an estimated population of over 400,000 (ONS, 2016). Where Travel to Work Areas are a combination of places, we have labelled the larger area only. Airports with in excess of 10 million passengers (2019) and Sea Ports handling in excess of 20 million tonnes of cargo (2019) within the lighter grey area are also shown. Places shown outside the area are the capital cities of the UK, Scotland and Wales.

Rail journey numbers in the Midlands and the North



The places included on this map are Travel to Work Areas in the North and the Midlands with an estimated population in 2016 of over 400,000 (ONS, 2016). Where Travel to Work Areas are a combination of places, we have labelled the larger area only. Airports with in excess of 10 million passengers (2019) and Sea Ports handling in excess of 20 million tonnes of cargo (2019) are also shown.



Rail journeys data represents the number of people travelling to and from city centre stations in each highlighted Travel to Work Area, not including interchanges (2018/19, million passengers; ORR, 2020)

1. The assessment

The government has asked the Commission to carry out an assessment of rail needs in the Midlands and the North of England, to inform the development of the government’s Integrated Rail Plan. The Commission plans to develop a menu of options for government and will assess how these different options can support the best outcomes for people and places. This will include how they facilitate the Commission’s objectives to support sustainable economic growth across all regions of the UK, improve competitiveness, and improve quality of life.

The assessment will:

- consider how best to integrate HS2 Phase 2b with wider transport plans in the North and Midlands, and accelerate benefits from investments
- include recommended options for scoping, phasing and sequencing delivery of HS2 Phase 2b, Northern Powerhouse Rail, Midlands Engine Rail – including Midlands Rail Hub – and other proposed rail investments
- consider the impact of proposals on rail connectivity with Scotland.

1.1 Background

The Oakervee review of HS2, published in February this year, concluded that Phase 2b of HS2 (the route from Birmingham to Manchester and Leeds), needs to be considered as part of an Integrated Rail Plan for the North and the Midlands.²

“The Review has, therefore, recommended establishing a further study to develop an integrated railway plan embracing Phase 2b alongside an integrated railway investment programme, with a regular, planned annual spend, for the Midlands and the North of England” – Oakervee Review³

The government has committed to developing an Integrated Rail Plan for the Midlands and the North, working with HS2 Ltd and local leaders. The plan will, among other things, consider how best to integrate HS2 Phase 2b and wider transport plans in the North and Midlands, delivering benefits from investments more quickly.⁴

The government has requested the Commission to carry out an assessment to inform the development of government’s Integrated Rail Plan, looking at the rail needs of the Midlands and the North, and the available evidence on Northern Powerhouse Rail, Midlands Rail Hub, HS2 Phase 2b and other proposed Network Rail projects.

The Commission has not previously considered HS2, as its remit excludes making recommendations that re-open decision-making processes where programmes and work have been decided by government, or will be decided in the immediate future, unless specifically requested.⁵ High Speed North, the Commission's report on transport connectivity in the North, recommended immediate and very significant investment to improve transport connectivity in the North, alongside a plan for longer term transformation to reduce journey times, increase capacity and improve reliability.⁶ The Commission also made recommendations to improve urban transport in the *National Infrastructure Assessment*.⁷

The recent Covid-19 outbreak has had a huge impact on the economy and on passenger demand for rail services. However, there is continued uncertainty as to the long term impact on the economy and on passenger behaviour. The Commission will work with stakeholders to understand the potential long term impact of Covid-19 on rail during this study, to the extent that this is possible as the situation develops.

1.2 Scope

As requested by government, the Commission is carrying out an assessment looking at the rail needs of the Midlands and the North, to inform the development of government's Integrated Rail Plan. The Commission will:

- **Consider how best to integrate HS2 Phase 2b and wider transport plans in the North and Midlands and accelerate benefits from investments:** The Commission will develop a menu of packages of rail investments in the Midlands and the North, which will include both short and long term investments. In developing the packages, the Commission will consider how to accelerate the benefits from investment for the Midlands and the North.
- **Include recommended options for scoping, phasing and sequencing delivery of HS2 Phase 2b, Northern Powerhouse Rail, Midlands Engine Rail – including Midlands Rail Hub – and other proposed rail investments:** The Commission will assess the strategic benefits of different proposals against a range of criteria, set out in Chapter 3. The Commission will aim to clarify the strategic choices that government needs to make between proposals and help identify those that will maximise the benefits to the Midlands and the North.
- **Consider the impact of proposals on connectivity with Scotland:** The assessment will focus on how potential rail investments in the Midlands and the North would affect connectivity to Scotland. However, extending or building new high speed lines to Scotland is out of scope of the assessment, see below.

More detail on the Commission's proposed methodology is set out in Chapter 3.

Areas out of scope

The Commission will only consider proposals for major rail investments in the Midlands and the North. This means any proposals outside the Midlands and the North or proposals for other modes of transport will be out of scope. The government has already taken decisions on HS2 Phases 1 and 2a, and therefore these schemes are out of scope of this review. And the Commission will only consider proposals where plausible cost estimates and evidence on the impact of the proposal on journey time, capacity, and reliability of service have been provided, or can be obtained. More detail on how the Commission will decide which proposals will be assessed is set out in Chapter 3.

The Commission's focus in the assessment will be on infrastructure requirements themselves and not how the railway will be run once investments have been completed. This means that commercial issues such as the approach to franchising and ticket prices will not be considered as part of the Commission's analysis. While commercial and organisational considerations may be relevant to the government's approach to the Integrated Rail Plan, these are currently being considered in detail by the Williams Review.⁸

The government has also asked the Infrastructure and Projects Authority to carry out a review on lessons learned from cost overruns on HS2 Phases 1 and 2a to inform the Integrated Rail Plan. This review will consider the effect of issues including the planning and consents process, engineering specifications and procurement models on costs of delivery.⁹ The Commission will also take into account the outcomes of this review, but the issues it covers will be out of scope of the Commission's assessment.

Rail plays a specialised role within transport interventions, offering key advantages for moving large numbers of people in and out of city centres, and for fast journeys between cities.¹⁰ The Commission's assessment will therefore focus on strategic rail investments between and into cities. This aligns with the projects that the government has committed to considering as part of the Integrated Rail Plan.¹¹ Local transport, while important, will not be considered, although the Commission will consider how strategic transport investment supports local transport plans. The scope of the assessment is limited to rail, and so the Commission will not consider how other transport modes could be used to achieve similar objectives.

Scotland, Wales and Northern Ireland

The Commission's role is to make recommendations to the UK Government, meaning devolved matters are outside its remit. In this study, the Commission has been asked to focus on the rail needs of the Midlands and the North specifically, and therefore the study will focus on these areas in England.

This means that, although most aspects of rail travel in Wales are reserved, the rail network in Wales is largely outside the focus of the assessment. While the assessment will look at connectivity with Scotland – as set out in the terms of reference for the Integrated Rail Plan – it will not consider options that would fall within the competence of the Scottish Government. All matters relating to rail travel in Northern Ireland are also out of scope of the assessment.

1.3 The Commission's objectives

The Commission will carry out the assessment in line with its objectives to:

- support sustainable economic growth across all regions of the UK
- improve competitiveness
- improve quality of life.

The Commission will therefore focus its assessment on:

- **Economic growth and competitiveness** – including improving productivity through agglomeration, unlocking investment in land around stations, improving trade and connectivity between places in the Midlands and the North, with Scotland, and with the rest of the world

- **Sustainability and quality of life** – including increasing access to amenities such as hospitality, entertainment, and other services, improving reliability, and assessing the lifecycle carbon emissions and impact on natural capital, including by considering the impact of freight on carbon emissions and congestion.

The assessment will consider the impact of freight on carbon emissions in future, but also its impact on congestion on transport networks, including around international gateways such as Liverpool Port and Port of Tyne. Freight will be considered for its impacts on sustainability and quality of life, rather than economic growth and competitiveness, as explained in box 3.3.

1.4 Emerging findings from stakeholder engagement

The Commission has conducted an extensive stakeholder engagement process and has carried out a Call for Evidence,¹² asking for evidence on the benefits and drawbacks of different schemes. The Commission received around 150 responses from interested organisations in civil society, business, government and community groups. The Commission is still analysing the many responses. A summary of that analysis as well as redacted responses will be published alongside the final report. The engagement so far has highlighted several key themes in terms of priorities, which support the Commission's work planned for the assessment, set out below.

Prioritising and sequencing

Stakeholders highlighted several issues around prioritising and sequencing. Responses suggested the Commission should consider areas where improvements such as station upgrades or electrification could begin earlier, for example if improvements do not rely on time intensive processes such as new legislation, and the need to ensure that integration points between HS2, Northern Powerhouse Rail, and other major rail upgrades are properly planned to address the needs of both schemes and ensure a coherent network.

Other points raised included the need to address specific constraints on the network early, such as congested lines across the Pennines and limited capacity on the East Coast Main Line, and the need for new infrastructure to accommodate growing rail needs. Several areas were identified as needing action before the arrival of major interventions such as HS2.

Resilience and reliability

Stakeholders highlighted that across the network there are bottlenecks which lead to congestion and disruption, particularly where limited track infrastructure is shared by inter-regional and local passenger services, as well as freight services. Some of these, like the Castlefield corridor in the North West or the current Transpennine route between Manchester and Leeds, create cross-network problems as the delays or cancellations they cause have knock-on effects on other parts of the network.

Connectivity and capacity

Stakeholders, including multiple cities and regions, reported that an important part of the value of major high speed rail projects is found in capacity benefits for existing local rail networks. By taking pressure off congested existing track more trains would be able to run on local networks, improving connectivity and the quality and frequency of services across local networks.

Supporting investment

Another common theme was the value of major rail investments in spurring investment in their areas. In some cases, this was focussed on associated station redevelopments and masterplans that would regenerate areas or deliver housing. Some places and cities also highlighted local growth strategies they had developed which were dependent on those schemes going ahead. In some cases, planned major projects were already seen to be stimulating investment.

However, a key priority for business and rail infrastructure providers was the importance of government providing certainty in its long term plans for the rail network. Certainty in terms of routes and delivery schedules is necessary for businesses to plan effectively and invest with confidence. For the engineering sector, certainty in terms of the pipeline of projects was raised as necessary for planning their resourcing and securing the right skills to meet the challenge.

Environmental impact

Stakeholders also raised the importance of ensuring that proposed interventions take account of potential impacts on natural capital and carbon emissions.

1.5 Providing a realistic assessment

Managing uncertainty

Uncertainty is inherent to any large investment decision. There has been significant discussion about the uncertainty around major rail projects, which has played out primarily in the debate over the costs and benefits of HS2. While progress has been made on HS2, a significant degree of uncertainty remains – particularly around phase 2b.¹³ This is also true for other projects, like Northern Powerhouse Rail, which are at an earlier stage of development.

The potential long term impacts of Covid-19 on rail travel imposes a further degree of uncertainty, alongside other factors that could impact demand for rail travel, including the development of autonomous vehicles, the price of driving, the structure of the economy and the sectors people work in, the extent of urbanisation, and the level of the population.

Against this backdrop, the Commission will seek to ensure that its analysis is as robust as possible, while recognising that some uncertainty is unavoidable given the timescales for infrastructure investment. Chapter 3 sets out some specific approaches the Commission will use to manage the uncertainty around the costs and impacts of investments. The overarching approach will be to be as transparent as possible about assumptions made and to acknowledge where uncertainty requires the Commission to make a judgement.

Affordability

The Rail Needs Assessment will be consistent with the government's wider fiscal framework and will need to consider the Commission's fiscal remit. The Commission's binding fiscal remit requires it to demonstrate that all its recommendations for economic infrastructure are consistent with, and set out how they can be accommodated within, gross public investment in economic infrastructure of between 1.0 per cent and 1.2 per cent of GDP each year between 2020 and 2050.¹⁴ This includes all public economic infrastructure within the Commission's remit, not just rail, and also includes existing schemes.¹⁵

The Commission last published a full fiscal remit table in the *National Infrastructure Assessment*.¹⁶

There is a lot more uncertainty now than when the *National Infrastructure Assessment* was published as to the amount of money available under the fiscal remit, due to the current economic uncertainty following the Covid-19 outbreak. The government will need to set the budget for rail investments in the Midlands and the North once the outlook for the economy and public finances are clearer.

To accommodate this uncertainty, the Commission will set out what the priorities for investment should be within a range of options for rail budgets in the Midlands and the North between now and 2045, using the rail spending proposed in the *National Infrastructure Assessment* as a starting point. More detail on these budgets is set out in Chapter 3.

The Integrated Rail Plan will have strategic choices to make about which projects to prioritise. Many of the proposals for investment in rail in the Midlands and the North, including HS2 Phase 2b, Northern Powerhouse Rail, and Midlands Engine Rail, require significant levels of investment over a long period of time. The scale of the investment required means that it is unlikely to be affordable, or deliverable, to do everything at once. The proposals that bring the highest benefits should be done first.

Finally, it will be important to ensure that the projected costs of proposals are realistic. Rail has a long history of overspends.¹⁷ Costs are hard to get right, and cost estimates are inevitably uncertain, especially for very large projects like HS2.¹⁸ The Commission will therefore scrutinise costs of proposals as much as possible, particularly considering optimism bias where there has been a tendency to underestimate the true cost. More detail on the Commission's methodology is set out in Chapter 3.

Deliverability

It will also be important to consider how many major interventions can be built at the same time. The Commission will consider the total cost of programmes, as will other areas including supply chain capacity, the ability to deliver the intervention whilst maintaining a service, and interdependencies with other major programmes.

The Infrastructure and Projects Authority's review of HS2 Phases 1 and 2a will draw on the lessons from HS2 to make recommendations for the delivery of the Integrated Rail Plan, particularly HS2 Phase 2b. This will include the effects of planning and consents processes, engineering specifications, and other issues on costs of delivery. The Infrastructure and Projects Authority will also provide a view on the capacity of the supply chain and what it is capable of delivering efficiently. The review will make recommendations for infrastructure including in the areas of legislation, planning, procurement and governance, to ensure all infrastructure projects can be delivered effectively.¹⁹ The Commission will take account of the outcomes of the review in this assessment.

Understanding rail needs

The Commission will conduct a programme of social research to understand the needs of both current rail users and potential users of future services. This research will explore why existing users use the railway and which improvements to their service they would most value. It will also examine what is preventing non-rail users from using the railway and whether any proposed improvements, such as greater service frequency, or more direct services, might encourage them to use new services in future. This will enable the commission to consider how to weight individual criterion within its multi-criteria analysis of proposed schemes, to ensure it incorporates the needs of current and potential passengers.

Secondly, proposed investment schemes will entail a level of disruption to the current network while delivery is in progress. There is a trade-off between greater levels of disruption to current services and the faster delivery of service improvements. The research will assess what level of disruption passengers are prepared to accept for the faster delivery of improvements and whether any mitigations, such as replacing services with slower direct trains rather than buses, might make disruption more acceptable. This information will support the Commission in considering the needs of existing passengers while developing proposals for the phasing of service improvements.

1.6 Accelerating benefits

The government has said that its Integrated Rail Plan will consider how best to integrate HS2 Phase 2b and wider transport plans in the North and Midlands, delivering benefits from investments more quickly.

The Commission therefore intends to consider the following areas while carrying out this assessment, to help ensure that plans are delivered that meet the needs of people and places as soon as possible:

- **Accelerating delivery:** The Commission will consider the feasibility of starting construction earlier and completing it more quickly. The Commission will also consider how the construction phase can be reached sooner, for example by making the process for gaining consent or regulatory approvals more efficient. This will draw on the work being carried out by the Infrastructure and Projects Authority.
- **Getting the timing and mix of interventions right:** The Commission will consider the sequencing of proposals to ensure that the needs of people and places are met effectively, for example by building the highest priority things first or making investments earlier to address known problems (where these also deliver long term benefits).
- **Delivering confidence by agreeing plans:** The Commission will consider how to ensure that government takes the necessary strategic decisions and agrees long term plans. Agreed long term plans will help provide investors and developers with the confidence to bring forward their plans and investments. In addition, this will support local government planning to maximise the benefits of schemes and start to deliver them sooner.

1.7 Next steps

The Commission will hold a series of roundtables, seminars and discussions with a range of stakeholders throughout the summer to gather views on its methodology and broader approach to the assessment. The final report, setting out an assessment of options for packages of investment in rail in the Midlands and the North, will be published in November.

2. Rail and economic outcomes

Despite being home to seven out of ten of England's largest cities²⁰ – many of which are not far apart – economic outcomes in the Midlands and the North of England are lagging behind those in the South of England. Geographic variation in economic outcomes is a long standing, self reinforcing problem that is complex to address. Rail cannot address this problem singlehandedly. Instead, rail interventions should form part of a comprehensive strategy to make cities and towns attractive places to live, work and invest in, alongside other factors including skilled employment, urban transport, good governance and local decision making.

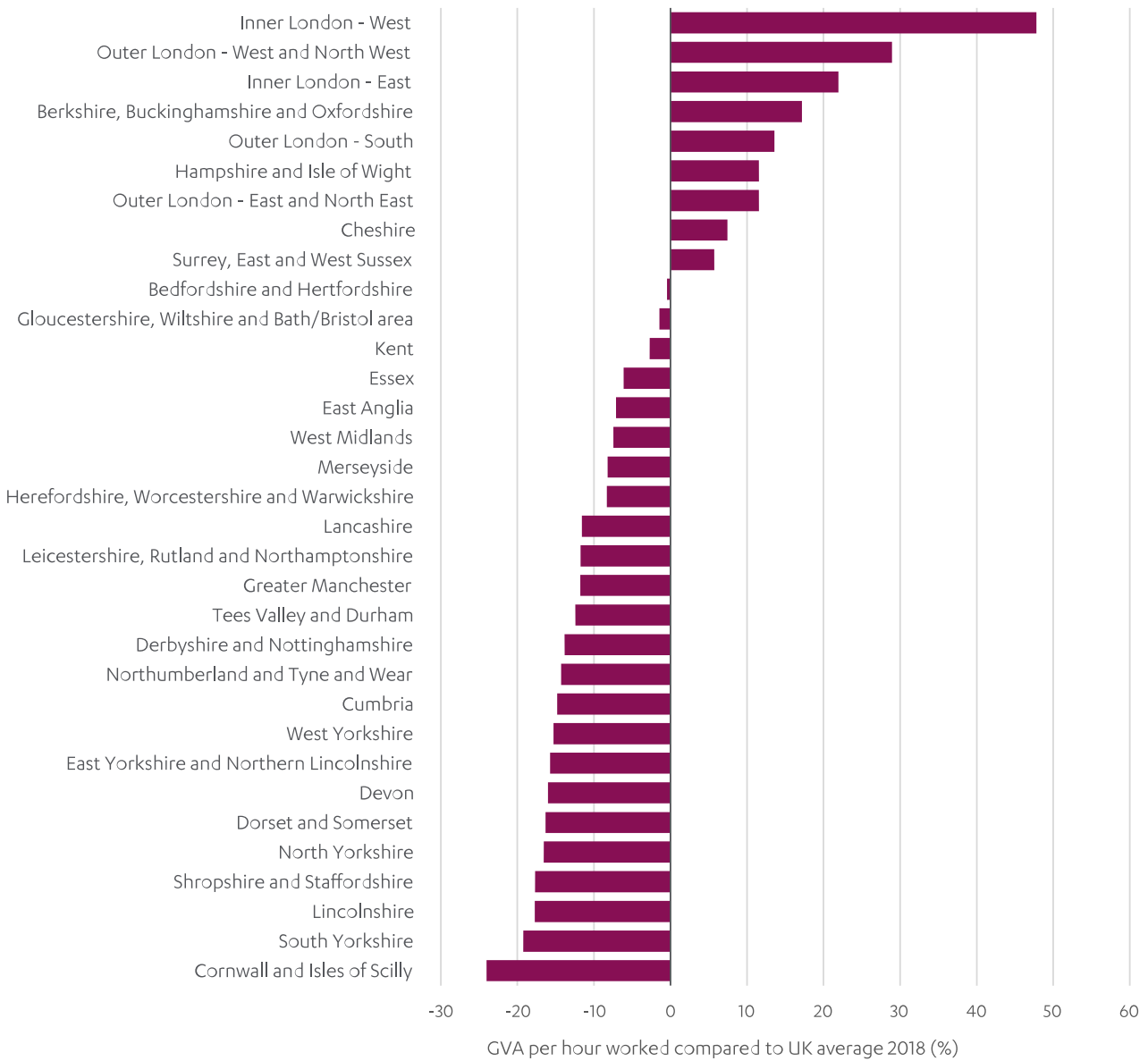
When working effectively, rail can transport large numbers of people into dense city centres and reduce travel times between large cities. This can support economic growth in cities and, consequently, in nearby towns. However, good rail connections must be combined with other interventions to make a difference to economic outcomes.

Rail journeys between major cities in the Midlands and the North can be slow, and the service unreliable. As the number of people commuting into cities in the regions grows, these problems need to be addressed to enable growth in cities and the surrounding towns.

2.1 Geographic variation in economic outcomes

The north-south divide in England has long been on the political agenda, and plans for improvements to rail services in the North and Midlands have been proposed as a way to grow their economies. England has an extensive and long-standing geographic variation in economic outcomes. Productivity and wages, which are closely related, vary widely both within and across regions.²¹

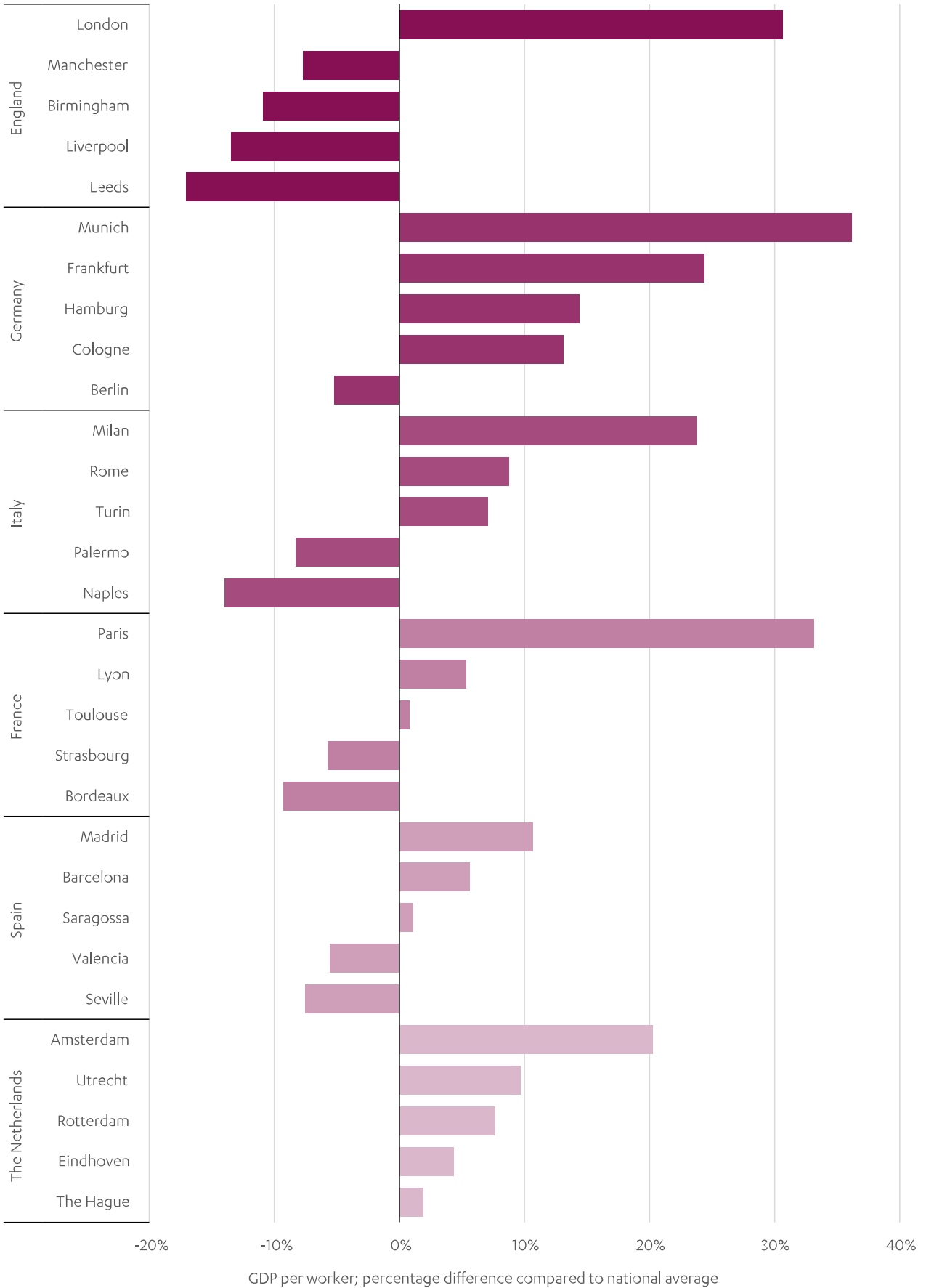
Figure 2.1: Regional productivity variation in England²²



As similar types of people and businesses tend to cluster together, some variation between places is inevitable. London was richer and more productive than the North of England even in 1900, despite the industrial revolution beginning in the North.²³ Other countries also face persistent regional economic variation.

However, the extent of regional variation within England appears to be unusually high compared to other countries.²⁴ England is also unusual in that few of its major cities, apart from London, have productivity above the national average, see figure 2.2, leading to a high productivity gap between the North and the South.

Figure 2.2: Productivity in selected major cities in England and comparable countries²⁵



Addressing this regional disparity is important. Patterns of local productivity underpin national productivity, and shape an individual's quality of life, view of the world (including perceptions of other regions) and opportunities, which can differ profoundly between low and high productivity places.²⁶ Whilst all regions have areas that are doing well and badly, there is a concentration of deprived areas within the Midlands and the North - the ten local authorities with the highest concentrations of deprived neighbourhoods are all in the Midlands or the North.²⁷

The Commission recognises that addressing regional disparities is part of its objective to 'support sustainable economic growth across all regions of the UK'. This involves supporting faster growth in low productivity regions and balancing this with the needs of high productivity regions to maintain their economic performance. The Commission will set out its interpretation of this objective in more detail through a discussion paper to be published later this year.

Variations are caused by multiple interacting factors

There are several factors which interact to create self-reinforcing cycles of success or deprivation in different places.²⁸ Firstly, highly skilled people and businesses tend to cluster together. This makes individuals more productive and able to earn higher wages, by allowing them to achieve greater expertise through increased specialisation and by learning from each other.²⁹ Businesses in highly skilled sectors also tend to cluster together with interrelated firms, which also makes them more productive. Highly skilled workers also attract highly skilled businesses, and vice versa. This 'agglomeration' effect is particularly true for the highly skilled business services that the UK specialises in.

Clusters of highly skilled businesses and people also attract other businesses, such as high end restaurants, which concentrate in areas where there are large numbers of well paid, skilled people who can pay for the services they provide. The availability of amenities and other services attracts other highly paid people who can afford their services, and this high demand pushes up property prices, further concentrating those who can afford them, and pricing out people with lower incomes.³⁰

These effects also work in reverse. People on low incomes seek out areas with low property prices and more affordable shops and services and move out of places where property prices are rising, and services are unaffordable. Therefore, people on lower incomes also tend to cluster together. Likewise, businesses that employ lower skilled people will tend to cluster in the same places as lower income workers.³¹

Geography can also increase the attractiveness of some places to certain people or businesses. For example, the offshore wind industry is centred in places such as Hull and Grimsby.³²

Cities are seeing more productivity benefits

Cities have gained from the rising relative importance of agglomeration effects as the economy has shifted towards high skilled services, and consumption has shifted towards services produced in cities.³³ The growth of student numbers has helped cities, where most universities are located. Cities with the best research focused universities have also benefited from knowledge spillovers.³⁴

In recent decades, cities such as Manchester and Leeds have shifted away from traditional manufacturing towards higher value added activities including research, creative, digital and business services that benefit from dense urban locations.^{35,36} This has led to rapid population growth in city centres (mainly driven by young professionals) where the population has doubled in size in the past 20 years, significantly outpacing central London.³⁷

The *National Infrastructure Assessment* also recognised these cities and others such as Birmingham and Sheffield as places with high employment growth and high congestion.³⁸ However, productivity in cities in the North and Midlands is still below the national average³⁹ and significantly less than cities in the South.⁴⁰ There are also large disparities in economic performance across city regions. Within Greater Manchester for example, productivity in Trafford is over a third higher than in Oldham.⁴¹

In contrast, some smaller cities and towns have experienced steady decline. Coastal communities have suffered from structural shifts in traditional industries including fishing, ship building and tourism.⁴² In general, isolated towns tend to have the worst employment outcomes, whereas towns with strong links to productive cities tend to have lower unemployment rates.⁴³ More recent economic shifts, particularly the rise of online shopping and services seem to be having a disproportionate impact on smaller cities and towns.⁴⁴

Variation can be persistent over long periods of time

These cycles of success and deprivation are highly persistent over time. Spatial disparities in economic and social outcomes have been a persistent feature in England for at least the last 150 years.⁴⁵ Many cities have a pronounced west to east pattern of wealth and deprivation that originates in the 19th century, when the industrial revolution made the eastern side of cities less desirable because prevailing winds blew smoke their way. These patterns remain today, decades after the cause was eliminated by clean air legislation.⁴⁶

However, persistence is not a certainty. Economic and social changes have shifted patterns of variation in recent decades. Regional variation in productivity reduced from the 1930s to the 1960s, before increasing again from the 1970s onwards, and becoming especially marked in the 1990s.⁴⁷ Over the past decade, variation in productivity between regions has declined, but variation within regions has increased.⁴⁸

Addressing variations in economic outcomes is necessary but difficult

Although addressing these regional disparities is important, there are no easy answers. Future economic or social shifts may change the balance of success and deprivation again, but traditional industries are unlikely to return. The magnitude of the challenge can be seen by how much firms and workers are willing to pay in higher rents to locate in successful areas.

There is a long history of government attempts to redress geographical variation in economic outcomes with at best mixed success, see box 2.1.

Box 2.1: History of regional regeneration policies

Regional policy can perhaps be dated at least as far back as the 1920s and has been a feature of government policy since. Following the Great Depression, the government introduced the 'Special Areas' legislation between 1934 and 1937, which made provision of aid to areas experiencing severe unemployment.⁴⁹ A Royal Commission in 1940 recommended "encouragement of a reasonable balance of industrial development, so far as possible, throughout the various divisions or regions of Great Britain."⁵⁰

There was broad political consensus on this goal in the post war administrations. The 1945-51 Labour government introduced policies to incentivise industrial relocation.⁵¹ The concept of regional plans was put forward by the Conservative government in 1963, and the 1964-1970 Labour administration established regional planning bodies.⁵² Despite the political consensus, progress was elusive. By 1969, regional differences remained and the regions needing support were approximately the same as in 1934.⁵³

Government in the 1980s aimed to encourage private investment through 'enterprise zones.' Growth was encouraged in areas that had lost out from industrial decline through tax incentives and simpler planning procedures to attract private developers and investors. Thirty-eight enterprise zones were designated between 1981 and 1996.⁵⁴

The Labour governments of 1997-2010 launched many initiatives aimed at economic, social and environmental regeneration. These have been summarised as focusing on four themes: neighbourhood renewal, urban renaissance, sustainable communities and competitive cities.⁵⁵ The 2010-2015 coalition government said it was taking a "different approach" to regeneration, providing local rewards and incentives to drive growth and improve the social and physical quality of areas.⁵⁶ The Chancellor of the Exchequer George Osborne launched the 'Northern Powerhouse' in 2014.⁵⁷

In 2017 the government launched an Industrial Strategy, which contained policies to address regional disparities.⁵⁸ In his first speech after becoming Prime Minister, Boris Johnson said he would "unite our country and level up" the UK.⁵⁹ The Industrial Strategy Council, which advises on the implementation of the Industrial Strategy, published a report in February 2020 on regional productivity differences which found them to be large and longstanding. It called for the government to "end the tendency to abolish and recreate regional policy".⁶⁰

A further factor is whether interventions move economic activity from one place to another, rather than increasing total activity, an effect known as 'displacement'. If this is the case, looking at gains overestimates the total impact on economic growth. Shifting economic activity between areas may be worthwhile on distributional grounds even if there is no net gain, if it improves outcomes in a relatively less successful area. However, evidence from economic regeneration policies shows that displacement instead often shifts activity from one struggling area to another.⁶¹

Any successful strategy for economic transformation will therefore need to be comprehensive and will need to recognise the scale of the regional variation challenge and its self-reinforcing nature. There are many interrelated issues, including skills, that would need to be addressed to break the cycle. It is important that interventions are targeted at increasing overall productivity, not simply relocating activities between relatively similar places. However, transport infrastructure investments can play a part in shifting places from a downwards cycle of deprivation into a cycle of success.

As part of a major regeneration project, begun in the 1980s, the Manchester Metrolink was extended to Salford Quays, a former seaport. The Metrolink line was a major incentive to prospective developers. In 2010, the BBC, which had long been considering relocating part of its activities to the North of England, moved five departments to the Quays, forming part of Media City.⁶² By 2015, there were around 3,500 residents and 900 businesses supporting over 26,000 jobs in Salford Quays.⁶³

Finally, an element of fate also seems to play a part in many successful transformations. In the United States of America, Seattle shifted from a declining city in the 1970s to a successful technology hub in part because Microsoft co-founders Bill Gates and Paul Allen grew up in the city and relocated Microsoft there in the early 1980s.⁶⁴ And in England, the tragedy of the IRA bombing of Manchester city centre was used as an opportunity to accelerate regeneration.⁶⁵ While policy can support transformational changes, fate also plays a part.

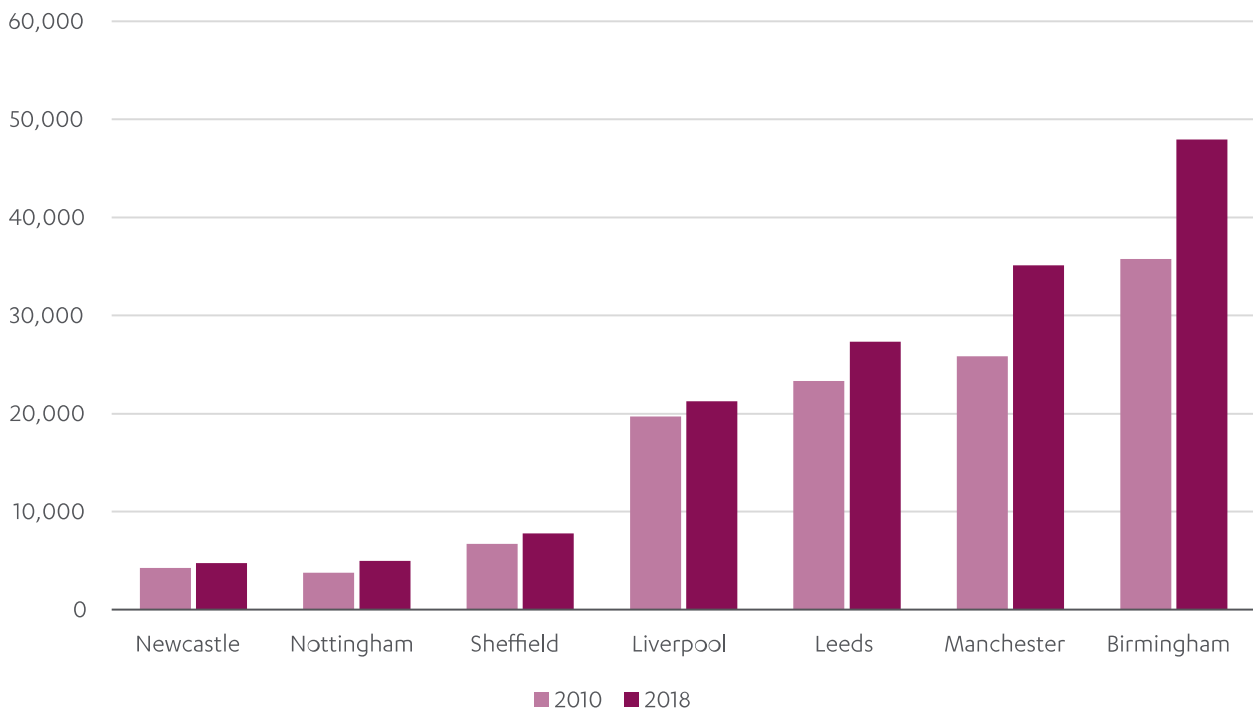
2.2 Rail in the Midlands and the North

Rail can contribute to improving regional economic outcomes. Rail commuting is growing, and the Midlands and the North are no exception. However, rail journeys between major cities in the Midlands and the North can be slow, and the service unreliable. But while London has seen large scale investment to increase capacity, the Midlands and the North also need investment to address the issues with rail and realise its economic benefits.

Rail commuting is growing

The major period of expansion in the country's railway network was between 1840 and 1890. However, railways peaked around the First World War. Between the 1920s and 1980s, rail entered a lengthy decline, with passenger numbers rapidly reducing. This decline reversed in the late 1980s and growth in passenger numbers accelerated again in the 1990s.⁶⁶ Rail use has continued to increase over the last two decades.

The number of people commuting by rail into cities in the Midlands and the North is growing, and this is happening particularly fast in Birmingham and Manchester. Between 2010 and 2018, passenger arrivals by rail during the morning peak increased 36 per cent in Manchester and 34 per cent in Birmingham. Nottingham also saw a large percentage increase in morning arrivals, but its overall number of arrivals remain relatively low. Figure 2.3 shows how arrivals into major cities in the North and Midlands have grown over the past between 2010 and 2018.⁶⁷

Figure 2.3: Morning peak rail arrivals by city

The numbers of overcrowded trains arriving in Birmingham, Manchester, Newcastle and Sheffield have increased over recent years.⁶⁸

Rail journeys between major cities are too slow and unreliable

In recent years, there have been major programmes of rail investment to catch up with the growth in passenger journeys. However, this has primarily focussed where rail use was close to capacity, particularly in London. There has not been a proactive strategy to improve rail in the Midlands and the North, where journeys between major cities are slower than similar journeys in the South and comparable European cities, and the service can be unreliable.

Faster rail connections between major cities can facilitate trade links and support economic growth in those cities. However, trains between Reading and London travel at an average speed of almost 90 miles per hour, almost double the speed of trains between Manchester and Leeds, which have an average speed of 48 miles per hour. Even outside London, trains between Bristol and Swindon travel at an average speed of 58 miles per hour, faster than most connections between northern cities.⁶⁹ And for some major cities, rail connections are even slower than travelling by road, see table 2.1.

Table 2.1: Connectivity – current average peak journey speed* between major cities in North & Midlands⁷⁰

	Manchester	Leeds	Nottingham	Sheffield	Liverpool	Newcastle	Bradford
Birmingham	55	58	45	65	52	66	45
Manchester		48	35	45	51	62	40
Leeds			41	45	50	74	28
Nottingham				44	35	54	34
Sheffield					40	66	34
Liverpool						61	37
Newcastle							57

*Estimated speed (miles per hour)

There is also a considerable difference between journey times in the Midlands and the North, and similar journeys in other countries. While the fastest train between Manchester and Leeds travels at 52 miles per hour, the fastest train between Amsterdam and Rotterdam travels at 67 miles per hour, and the fastest train between Dusseldorf and Cologne at 80 miles per hour.⁷¹ Train journeys in the Midlands and the North have a lot of catching up to do.

Table 2.2: Rail speed* comparisons with other countries⁷²

Randstad

	Rotterdam	The Hague	Utrecht
Amsterdam	67	62	56
Rotterdam		39	55
The Hague			60

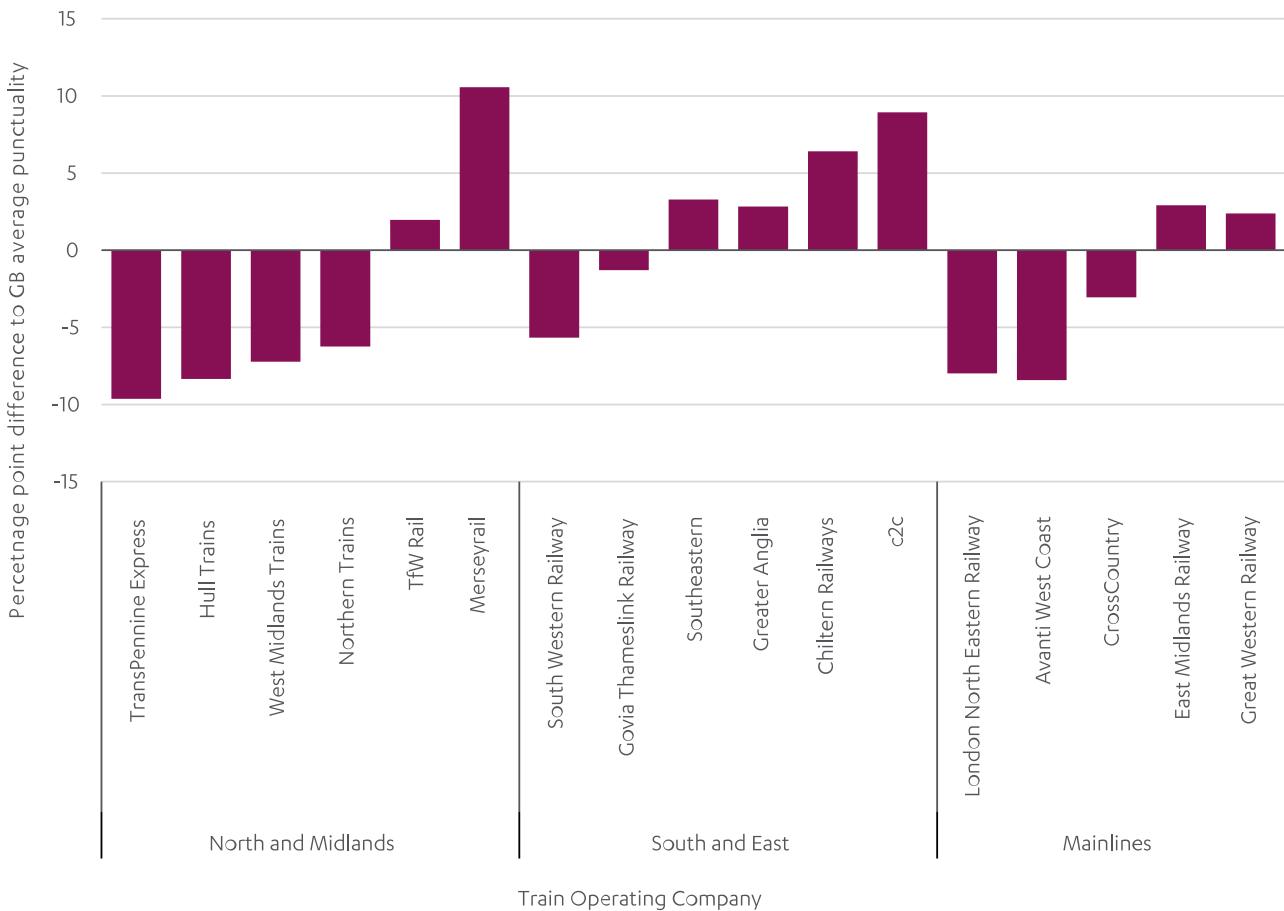
Rhine-Ruhr

	Bochum	Dortmund	Duisburg	Dusseldorf	Essen	Hamm	Cologne	Krefeld	Wuppertal
Bonn	59	53	65	66	61	61	77	42	59
Bochum		75	59	62	75	66	64	43	41
Dortmund			62	60	63	80	53	49	53
Duisburg				71	64	55	64	47	47
Dusseldorf					60	53	80	46	50
Essen						55	62	48	36
Hamm							60	48	64
Cologne								44	68

*Estimated speed (miles per hour)

Train operating companies in the Midlands and the North have poor performance overall compared to the national average, see figure 2.4. Performance in the Midlands and the North is a challenge, due to factors including the number of trains on the network, existing bottlenecks, ageing infrastructure and overcrowding.⁷³

Figure 2.4: Train Operating Company punctuality relative to national average, 2019-20⁷⁴



Source: Office of Road and Rail

Northern Rail, CrossCountry, TransPennine Express, and Hull Trains, four train services in the Midlands and the North, all performed worse than the national average for the percentage of trains arriving on time in 2018-19 and 2019-20. In addition, West Midlands Trains also performed slightly below average for trains arriving on time. Merseyrail, which is a self contained train network,⁷⁵ is an exception in the North, as it is one of the best performing train operating companies nationwide.⁷⁶

Investment is needed in rail in the Midlands and the North

Improvements to rail services in the Midlands and the North are needed to accommodate the growing number of people commuting by rail. The problems with reliability and speed of services need to be addressed, to ensure that people can travel between major cities more quickly and reliably. And improvements to rail services can also catalyse other economic activity.

2.3 The role of rail in economic transformation

Good transport connections and services are necessary to deliver economic transformation. However, they cannot deliver economic transformation alone. When the railway was a new innovation, and the alternative for most people was horse-drawn coaches or walking, it had a transformative effect on the economy.⁷⁷ However, upgrading rail today will not have the same effect. England already has extensive road and rail networks. Few places are genuinely isolated, so the effect of transport is less transformative.⁷⁸

But good rail connections can contribute to a solution by:

- **Increasing the density of clusters of people and businesses** – Only high density transport modes, such as rail, can support the highest densities of businesses and workers in city centres.⁷⁹ Rail connects cities and towns, supporting the highest densities in city centres by supporting commuting from nearby towns to support high density clusters of businesses and workers. Increased density can increase the productivity of existing firms and workers in cities, improve the environment for innovation, and make them more attractive locations for businesses and workers to locate in.
- **Facilitating ‘trade’ between cities** – Faster, more frequent rail connections can enable businesses to source a wider range and better quality of inputs to their supply chains by reducing the cost of distance. Rail connections between cities can also increase the size of market that any one provider can access, allowing successful firms to grow, benefit from economies of scale, and potentially specialise in higher value niche services that would be uneconomic in smaller markets. In turn, this increases the incentives on workers to specialise and upskill. These trade links can also allow a more successful business in one city to put an equivalent business in another city out of business by taking their customers, as the former competes for market share across a wider customer base.⁸⁰
- **Making places more attractive to live and work in** – Rail connections can make a place a better option to live in, by facilitating access to a wider range of other places, businesses and services, and giving an alternative to using the car in congested streets, reducing air pollution.
- **Encouraging investment** - Major infrastructure investments can act as anchor investments, signalling to the market that locations are worth investing in, because other people or businesses are also likely to move there. This helps to solve coordination problems where the value of private sector investment depends on other investors making similar choices.⁸¹

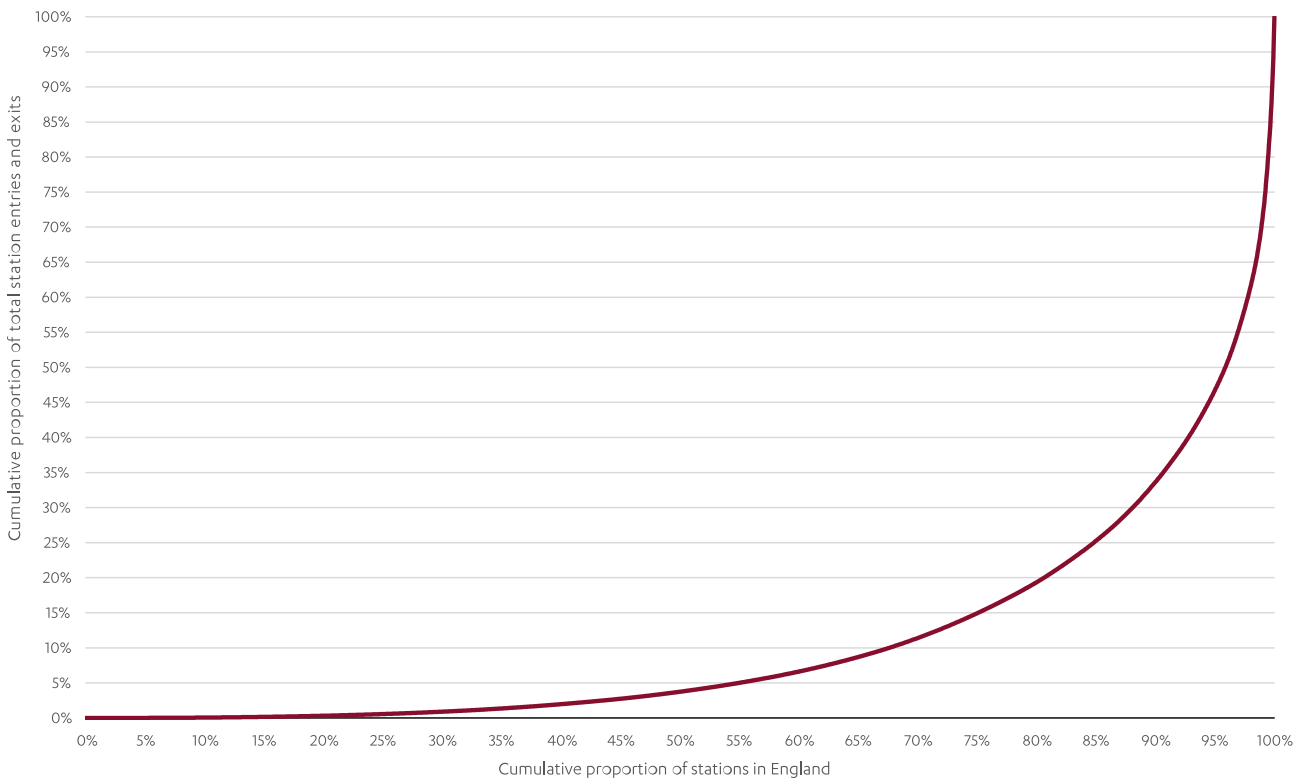
While rail can contribute to a solution, it is not the whole answer. Rail interventions should form part of a comprehensive strategy to make cities and towns attractive places to live, work and invest in, alongside other factors including skilled employment, urban transport, good governance and local decision making. In the *National Infrastructure Assessment*, the Commission recommended that cities should have the powers and funding they need to pursue ambitious, integrated strategies for transport, employment and housing.⁸²

Rail is most effective for journeys between or into big cities

Within transport interventions, rail plays a specialised role. Only nine per cent of journey miles are by rail.⁸³ Cars are relatively cheap, comfortable and offer privacy and end-to-end journeys. Electric vehicles, combined with renewable or other low carbon electricity, will offer low cost, low carbon transport for more and more people in the coming years;⁸⁴ government is consulting on bringing forward the phase out date for petrol and diesel cars to 2035 or earlier.⁸⁵ For people on low incomes, cars and buses are the main transport mode.⁸⁶ Rail is predominantly used by higher income travellers.⁸⁷ However, rail offers key advantages for certain journeys.

Firstly, rail can move large numbers of people in and out of congested city centres, where there isn't enough space for everyone to use cars, and where air pollution is a concern. Rail connects cities with the surrounding area, allowing people to commute into major cities from nearby towns. Most rail journeys start or end in one of England's biggest cities; 25 per cent of rail journeys in England start from or finish at less than 1 per cent of all stations.⁸⁸ The most common reason for taking the train is commuting.⁸⁹

Figure 2.5: Cumulative proportion of station entries and exits against cumulative proportion of stations in England⁹⁰



Secondly, rail offers fast journeys between city centres. For long distance journeys, trains on high speed lines like HS1 can reach speeds of 185 miles per hour.⁹¹ Even slower trains can offer faster journeys into crowded city centres than by car.

The benefits from rail are stronger where cities have a core of high skilled employment, because gains from agglomeration and specialisation are highest in high skilled sectors and because rail is predominantly used by higher income travellers.⁹² Conversely, some cities continue to have low productivity and a low skilled population despite strong rail connections because other factors are not in place, such as Doncaster on the East Coast Main Line.⁹³

To contribute successfully to a wider strategy of tackling regional variability, rail investment should therefore focus on journeys both between major cities, and into major cities from their surrounding areas. High speed, longer distance lines can only serve the largest destinations, as these higher speeds are only possible when trains make infrequent stops. The evidence suggests that people do not often commute between cities, even where there are good transport links – for example, in Germany, although Dusseldorf is located between two other city regions in the Rhine-Ruhr, and has good transport links, no more than six per cent of total working residents commute to each of the other two, which is not significantly higher than the share of working residents commuting from Liverpool to Manchester (four per cent) or from Sheffield to Leeds (five per cent).⁹⁴

Therefore, the predominant effect of enhancing high speed long distance links is to improve the prospects for trade between cities, offering firms a wider choice of potential supply chain partners in high skilled services where face-to-face contacts matter.⁹⁵

Box 2.2 Who benefits from rail investment?

Only nine per cent of journey miles are by rail.⁹⁶ However, the benefits of rail investment do not just fall to those who use the railway. Rail investment also brings benefits to the cities it connects and the towns nearby. Who uses the railway?⁹⁷

- Rail is mostly used for commuting, and it tends to be used for longer journeys
- Most rail journeys are made by working age commuters who work in managerial and professional occupations
- Rail is primarily used by those in the highest income groups – in 2018, the people with the highest real income level in the UK made three times more journeys by rail than those in the lowest income group
- Men, on average, take slightly more rail journeys per year than women, although the differences are small between some age groups – women aged 21-29 made 37 rail trips on average in 2017, compared to 41 rail trips for men aged 30-39⁹⁸
- As a proportion of journeys by public transport, people aged 17-39 took more trips by rail than other age groups
- People without mobility disabilities use rail more than people with mobility disabilities
- Although between 2014 and 2018 Black people on average travelled the shortest distance and made the fewest trips in England, Black people made more trips by rail per person (five per cent) than any other ethnic group, and the share of total distance travelled by rail by Black people (16 per cent) was twice that of white people (the least for any ethnic group).⁹⁹

Who will share the wider benefits of rail investment in the Midlands and the North?

- The economic benefits of rail tend to fall primarily to cities, which generally have a more diverse ethnic makeup than rural areas¹⁰⁰
- The population of cities also tends to be younger – the population in major cities in the Midlands and the North is younger on average than the population as a whole¹⁰¹
- Disposable income in the Midlands and the North is below the UK average,¹⁰² and all major cities in the region have a lower disposable income per person than the UK average¹⁰³
- As a proportion of the population of the region, the regions in the Midlands and the North have a higher percentage of disabled people than other regions¹⁰⁴
- The majority of the regions of the Midlands and the North have around 85-87 per cent white British population, compared to an average of 86 per cent across England and Wales¹⁰⁵ – the North East is the least ethnically diverse region of the UK, with 95 per cent white British population, while the West Midlands has a 79 per cent white British population, making it the most diverse region outside London.¹⁰⁶

Successful cities also improve the prospects for nearby towns

Although rail interventions can most successfully support big cities, this is not to say that towns should be left behind. Successful cities can improve the prospects for struggling towns in the vicinity. Most successful towns in England are close to successful cities.¹⁰⁷ Increased capacity on rail links between the major cities of the Midlands and the North and their surrounding towns can support towns by creating the opportunity for them to attract high skilled commuters. Typically, highly skilled people move to cities when they are young, often when they start or finish university.¹⁰⁸ Later in life, many choose to live in the surrounding area, often still working in the city. Increasing the number of highly skilled residents in towns leads to a similar upward cycle of success in towns as in the nearby city.

Again, transport links on their own are unlikely to be enough to transform the economic outcomes of any town. Highly skilled commuters can choose between towns. Some towns will have natural advantages such as beautiful locations or historic centres that they may be able to exploit to attract more highly skilled workers to live there. But other factors, such as the availability of good housing, schools, local transport, and amenities, low crime rates and good governance will also affect where people choose to live. Local decision making, and knowledge about specific circumstances, will also be important.

Interventions that simply relocate skilled commuters from one town to another are unlikely to improve prospects in the region overall, since one town's gain would then be another's loss. However, interventions that increase productivity for the city-region as a whole can improve prospects for some towns without others losing out.

While other factors need to be in place, good transport links are important for towns. The programme of rail disinvestment in the 1960s, known as 'the Beeching Axe', dismantled underused and unprofitable railway lines. The removal of railways is often blamed for contributing to the decline of rural areas and peripheral towns in post-war Britain. The loss of rail access, where road access was not improved to make up for the loss, led to a decline in population, including a relative decline in skilled workers and a decline in the proportion of younger people, in the areas affected.¹⁰⁹ This shows the importance of transport infrastructure in the economic success of towns. The right mix of road, rail and other modes such as tram and bus links will vary between towns, as will the mix of other interventions needed to bring success. Many of these decisions can only be taken at local level.

3. Methodology

In this assessment’s final report, the Commission intends to present the government with options for packages of rail investments that will maximise benefits to the Midlands and the North.

Government should not be presented with a proposed best option that is unaffordable or would crowd out investment in other infrastructure priorities. The Commission will instead group proposals for rail investment into packages with similar cost profiles over time. This will enable the Commission to compare these packages based on their potential benefits, irrespective of cost. The existing estimates for costs of schemes will be scrutinised to take account of optimism bias.

The Commission will use its own methodology, set out in this chapter, to assess the potential benefits of the packages, focussing on what rail is good at compared to other modes: transporting people into dense city centres and providing high speed links between cities. Existing approaches to assessing the impact of rail investments on economic growth, such as conventional cost benefit analysis, while a useful starting point and the basis for many previous investment decisions, fail to fully capture the interactions between rail investments and other factors, such as skilled employment and urban development. The Commission’s methodology will instead focus on the potential benefits rail can bring, which may or may not be realised depending on other factors.

The Commission welcomes views on the specific questions on the methodology set out in this chapter. Details on how to respond are set out in Chapter 4.

3.1 Identifying proposals for investment

The Commission has conducted an extensive stakeholder engagement process including a Call for Evidence asking for evidence on the benefits and drawbacks of different rail interventions. As part of the Call for Evidence, the Commission asked which potential investments should be in scope of the Commission’s assessment of the rail need of the Midlands and the North.¹¹⁰ The Commission is still analysing the many responses, and a summary of that analysis as well as the responses (redacted as appropriate e.g. for commercial sensitivity or individual privacy) will be published alongside the final report. In developing its assessment, the Commission is intending to assess the potential investments proposed through the recent Call for Evidence, and the extensive stakeholder engagement exercise conducted alongside it, to identify viable proposals.

To select options that maximise the benefits to the Midlands and the North, the Commission will consider strategic rail proposals that meet the following two considerations:

- **Is the proposal in the scope of this assessment?** The Commission will only consider proposals for investment in rail in the Midlands and the North that have benefits beyond the immediate location of the intervention. The Commission will not consider specific local schemes, interventions best dealt with through the rail franchising process such as local station upgrades, or interventions in the scope of the government’s Restoring Your Railway fund. Chapter 1 sets out the scope of this assessment in more detail.

- **Is there enough information available for the Commission to assess the proposal?** The Commission will only consider proposals where plausible cost estimates and evidence on the impact of the proposal on journey time and capacity have been provided. The Commission may also consider proposals where this information can be obtained or generated.

Proposals that meet both criteria will be considered. This means that the Commission will consider a range of options for potential major rail investments in the Midlands and the North, including:

- the scoping, phasing and sequencing of HS2 Phase 2b, Northern Powerhouse Rail and Midlands Engine Rail
- options for the redevelopment of Manchester Piccadilly station
- the Transpennine Route Upgrade
- improvements to existing lines, including the Midland and East Coast Main Lines.

The Commission will also consider more generic interventions such as electrification, digital signalling and the role of rail freight, and relatively smaller interventions which might yield earlier benefits.

Question 1: Please provide specific sources for evidence that the Commission could use in estimating costs and the impact of proposals on journey time and capacity.

3.2 Developing packages of proposals

It is for the government to decide on the level of spending on rail investments in the Midlands and the North. The Commission's assessment will consider what to spend a given amount of funding on and so clarify the strategic choices for government.

Once the Commission has identified proposals, there needs to be a way to assess the relative merits of each. The Commission does not propose to produce estimates of the costs and benefits of each proposal based upon standard cost benefit analysis. Instead, the Commission will group the proposals into packages.

Each package will come under one of three options for cost profiles between now and 2045, one consistent with strategic rail spending proposed in the *National Infrastructure Assessment*, one that assumes, for illustrative purposes, the money available for rail spending is 25 per cent higher, and one that assumes the money available for rail spending is 50 per cent higher.

This will allow a like for like comparison between packages of proposals, within three scenarios for possible government spending on rail. The packages will each be assessed to see which yields the largest potential benefits against a range of criteria (set out in table 3.2 and below), subject to consistent assumptions.

To do this, the Commission will need to develop an understanding of the realistic costs of each proposal, using existing estimates as a starting point, set an overall budget for three cost profiles, and group the proposals into packages that sit within these cost profiles.

Assessing proposal costs

There is a long history of overspends on major rail projects.¹¹¹ The cost of electrification of the Great Western railway grew by £2.4 billion between 2013 and 2016.¹¹² Costs for the West Coast Main Line upgrade rose by £7.8 billion.¹¹³ The central section of the Elizabeth line was initially planned to open in December 2018, but this has since been delayed to 2021, and the costs of the project have increased by £2.8 billion since 2011.¹¹⁴ And the Oakervee Review found that the HS2 project, as currently scoped, no longer falls within the existing funding envelope.¹¹⁵

Cost overruns are driven by several factors, from underestimation of the cost and quantity of materials required, to external factors such as changes in standards during construction. However, cost estimates for projects continue to not sufficiently consider these possibilities, in part down to optimism, and current allowances for optimism do not seem to be enough to offset this. There is a body of evidence to support the use of data and improved estimation methods to reduce the need for judgements to be made that may be at risk of optimism bias.¹¹⁶

Therefore, rather than just accepting the current estimated costs for proposals, the Commission will undertake further analysis of optimism bias, based on historic data on rail scheme costs (reference class forecasting). The Commission will also consider the review being carried out by the Infrastructure and Projects Authority on lessons learned from cost overruns on HS2 Phases 1 and 2a, and how the costs of major schemes may be reduced in future.

Setting an overall budget for rail packages

Once an internal view of proposal costs has been developed, the Commission will be able to group proposals into packages with similar cost profiles over time. The bounds of these cost profiles will be based on the Commission's binding fiscal remit.

The Commission's binding fiscal remit requires it to demonstrate that all its recommendations for economic infrastructure are consistent with, and set out how they can be accommodated within, gross public investment in economic infrastructure of between 1.0 per cent and 1.2 per cent of GDP each year between 2020 and 2050. This includes all public sector economic infrastructure within the Commission's remit, not just rail, and also includes existing schemes.¹¹⁷

The Commission last published a full fiscal remit table in the *National Infrastructure Assessment*.¹¹⁸ The Commission prioritised support for new infrastructure networks, such as full fibre broadband and the electric vehicle charging network, which are time critical and present major opportunities for growth. In rail, the Commission noted that there would be a large increase in expenditure in the 2020s including due to HS2 and Northern Powerhouse Rail.

However, the Commission stated that, in the late 2020s, this should be balanced with other priorities, while protecting funding for rail maintenance and renewals. In particular, the Commission prioritised urban transport over intercity networks in the 2030s, by which time intercity rail will have seen at least a decade of sustained high investment.¹¹⁹

The Commission will use the proportion of the fiscal remit spent on strategic rail enhancements in the *National Infrastructure Assessment* as a starting point for setting potential budgets for major rail investments in the Midlands and the North. HS2 and Northern Powerhouse Rail are already included in the fiscal remit.¹²⁰ These were based on earlier cost estimates, and the anticipated cost of both schemes has since risen.¹²¹

The fiscal remit calculations in the *National Infrastructure Assessment* also included some ongoing rail spending on improvements and renewals, and other schemes have been developed since the *National Infrastructure Assessment*. The annex published alongside this report sets out which schemes are included in the existing fiscal remit figures.¹²²

The total estimated cost of HS2, Northern Powerhouse Rail and Midlands Engine Rail is in the region of £101 – 139 billion in 2019/20 prices between 2020 and 2045,¹²³ significantly above the £86.2 billion assumed in the *National Infrastructure Assessment* for rail spending within the remit of this assessment between 2020 and 2045. This is a tentative range based on the information available, and the Commission will be attempting to understand the full detail on costs further throughout the course of this assessment. It also does not include the costs of other major investments, such as the TransPennine Route Upgrade and other networks upgrades, which the assessment will consider.

The principle of balancing spending on rail against other infrastructure spend remains relevant. The Commission will not reopen other sections of its fiscal remit recommendations to fund strategic rail. While important, rail accounts for less than 10 per cent of total journey miles. This means that the recommended fiscal remit allocations to roads, local and urban transport, and other infrastructure sectors will all remain as specified in the *National Infrastructure Assessment*.

It is for the government to decide on the level of spending on rail investments in the Midlands and the North. There is a lot more uncertainty now than when the *National Infrastructure Assessment* was published as to the amount of money available under the fiscal remit. Current estimates for GDP have higher levels of uncertainty, due to the ongoing Covid-19 outbreak. The government has stated that they intend to review their fiscal framework ahead of Autumn Budget 2020, and the latest Budget implied a significant uplift in capital spending.¹²⁴ The government will also need to make choices on the balance between investment in social and economic infrastructure, the balance between spending on different types of infrastructure and how 'levelling up' should influence spending between and within regions.

To inform these choices, the Commission will set out what the priorities for investment should be within three illustrative options for budgets for rail spending in the Midlands and the North.

These will be:

- **NIA consistent** – A fiscal envelope consistent with rail spending proposed in the *National Infrastructure Assessment's* fiscal remit table¹²⁵
- **+ 25 per cent** - A fiscal envelope that assumes the money available for rail spending is 25 per cent higher than in the 'NIA consistent' scenario
- **+ 50 per cent** – as above, but assumes the money available for rail spending is 50 per cent higher than in the 'NIA consistent' scenario.

The + 25 per cent and + 50 per cent scenarios could be achieved through a combination of additional government spending, or reprioritisation of spending, although the Commission advises the government not to reprioritise spending within the fiscal remit.

Although the full expected costs of the schemes does not fall within the + 50 per cent scenario, making cost reductions on existing schemes could enable more suggested proposals to be included in this fiscal envelope.

The annex published alongside this report sets out how the fiscal envelopes for packages have been derived from the strategic rail budgets in the *National Infrastructure Assessment's* fiscal remit.¹²⁶

Developing the rail packages

All packages of proposals will include the Commission's 'baseline', which will include any spending on major rail investments that government has already committed to and HS2 Phase 1 and 2a (based on the latest costing). Packages will take Control Period 6 (Network Rail's five-year financial plan for 2019-2024) commitments in the North/Midlands into consideration, but the investment is assumed to be committed so they will not be included in the packages' funding envelope. The Commission will consider whether this should also include decarbonisation schemes to fit with the government's commitment to achieve net zero greenhouse gas emissions by 2050, and digital signalling.

In addition to the baseline package, the packages will initially be based around prioritising each of the major proposals. Other complementary proposals will then be added to the package, where it makes sense for proposals to go together, as the value of one is increased by the other. The remainder of the package will be made up by other medium and smaller sized proposals, to reach a package of proposals the cost of which falls within five yearly budgets set out in the cost profile. In drawing together proposals to form packages, the Commission will need to carry out careful analysis of interdependencies between various proposals and will test these with key stakeholders.

Packages will then be assessed using the methodology set out in section 3.3. The Commission may then need to iterate the packages, and test several variants of the same basic package, to ensure that interdependencies and complementarities have been properly captured. For example, if there are multiple options for a piece of routing, each of which would be consistent with the remainder of a particular package, it may be necessary to test variants of that package with each option.

The Commission will also develop a package of potential new investments which does not include any of the major schemes. This will provide a comparator against which to assess the potential benefits of major schemes.

While each package will set out plans for spending on proposals between now and 2045, there is also a need to consider ways to meet the needs of people and places as soon as possible, as discussed in Chapter 1. This could be achieved in packages either through sequencing proposals to ensure the highest priority proposals are built first or making investments earlier to address known problems (where these also deliver long term benefits).

The proposed approach to developing packages of investments reflects the way most public expenditure decisions are taken. Departmental budgets are fixed in multi-year spending reviews and then allocated between projects. Choices are made between projects within largely fixed sums of money. Once the packages have been developed, the Commission will assess the potential benefits of each package against a number of criteria, see below.

3.3 Assessing the packages

Rail interventions are necessary but not sufficient to drive economic transformation in cities and regions in the UK, (see Chapter 2). Rail investments have the potential to deliver wider economic benefits, but without other factors in place, these benefits may not be realised. However, this means that it is difficult to assess the impact of proposed rail investments. The Commission has developed a new methodology to assess the potential benefits of rail investment packages.

The challenges of conventional approaches

Conventional approaches to cost benefit analysis aim to assess the impact of transport interventions in isolation, focussing on the marginal impacts of the intervention on economic growth.¹²⁷ This avoids claiming that rail investments will deliver benefits that are due to other factors, but fails to fully capture more dynamic interactions between transport and economic growth (as discussed in Chapter 2). Some have argued that this leads public investment to be channelled into areas that are already doing well, because the effects of transport alone are highest there, creating a further self-reinforcing cycle of divergence.¹²⁸

The alternative is to assume that other factors, such as skilled employment or urban transport, will be in place and rail investment is the final piece of the puzzle that will enable wider transformational benefits. However, this approach fails to capture either the costs or the probability of success of those other necessary factors, likely leading to exaggerated results.¹²⁹

Ideally, it would be possible to assess the impacts of all the relevant factors and interventions jointly. However, this is very complex:

- even if full information on all the interventions were available, it is difficult to assess their effects in combination
- relevant decisions (e.g. on skills, housing, local transport, and rail) are made by different decision-makers at different levels of government with different objectives, so there is not a clearly defined package of interventions to assess
- there is too much uncertainty, as social and economic changes will occur in ways that cannot be predicted in advance.

Approaches using complex ‘black box’ models may seek to capture the interactions, but lack transparency. None of these approaches are therefore suitable for assessing transformational changes, and therefore aren’t appropriate to use for this assessment.¹³⁰

The Commission’s approach

The Commission has therefore developed an alternative methodology for the Rail Needs Assessment. Instead of trying to directly assess the effect of rail interventions on growth, which presents challenges (as set out above), the Commission’s methodology takes the more straightforward approach of assessing the potential for rail investments to support both economic growth and competitiveness, and sustainability and quality of life (see table 3.2). Whether that potential is realised will depend on other factors, many outside the scope of the Commission’s remit.

The following table sets out the criteria that will be used to assess packages against economic growth and competitiveness, as well as sustainability and quality of life. Each of the criteria are explored in more detail below, with an explanation of why they are important and how they will be calculated.

Table 3.2: Criteria against which the packages will be assessed

Criteria		
Economic growth and competitiveness	Productivity (through rail agglomeration impacts ¹³¹)	
	Connectivity	...between places in the Midlands and the North
		...to Scotland
		...with the rest of the world
Unlocking investment in land around stations		
Sustainability and quality of life	Amenity benefits from services concentrated in cities ¹³²	
	Impact of rail freight on congestion and carbon emissions	
	Natural capital ¹³³	
	Lifecycle carbon (CO ₂ e) emissions	
	Reliability	

Productivity

Rail can move large numbers of people in and out of congested city centres, enabling a higher density of skilled employment. This increases productivity of people and businesses,¹³⁴ in an effect known as ‘agglomeration’. Since many of the problems with rail capacity are in the commuting peak periods, increasing rail capacity for journeys into and out of major cities can deliver increased agglomeration benefits.

The Commission will calculate agglomeration benefits from the increase in effective density enabled by greater capacity delivered by rail proposals in the packages. This increase will then be multiplied by the impact of greater density on productivity, for which a range of estimates already exist. This approach was set out in the Commission’s working paper *Capturing the value of urban transport investments*.¹³⁵ More detail on the approach is set out in box 3.1. This will establish the potential for improvements in productivity enabled by delivering greater capacity on the rail network.

Box 3.1: The Commission’s methodology for agglomeration impacts

Conventional cost-benefit analysis in transport starts from ‘user benefits’ such as journey time savings. Wider economic benefits from agglomeration can then be added provided care is taken to avoid double-counting. However, this approach has been criticised for commuter journeys, because assumptions made around time savings do not appear consistent with the empirical evidence on travel times.¹³⁶

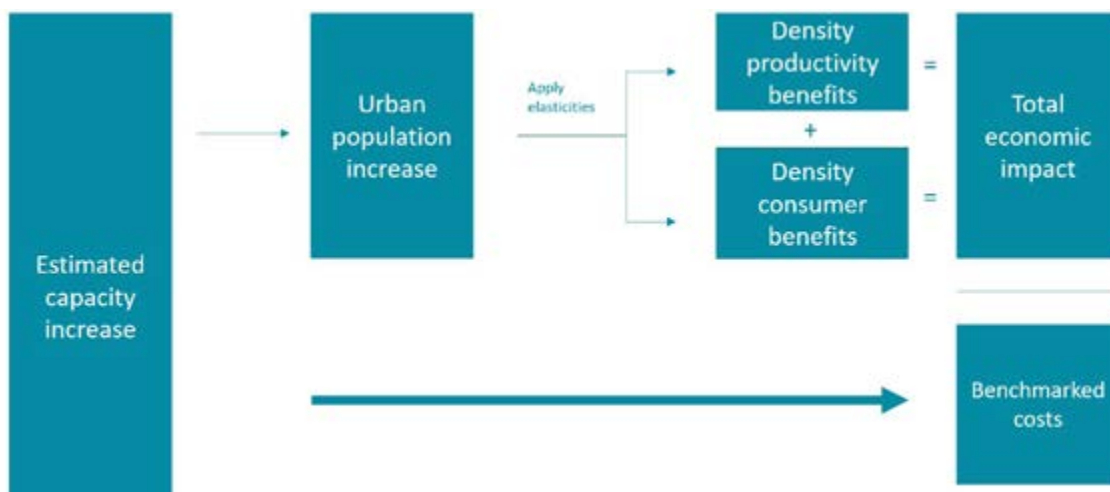
The Commission has therefore developed an alternative approach, as set out in *Capturing the value of urban transport investment*.¹³⁷ This starts from an assumption that, in growing cities, new transport capacity is fully used. For example, new roads lead to more journeys rather than reductions in congestion.¹³⁸ For rail, this would imply that additional capacity does not lead to a reduction in crowding, but rather to an increase in the number of passengers carried.

Starting from this assumption, it is possible to estimate the benefits of capacity increases without relying on contested assumptions around user benefits. A key aspect of this is the ability for larger numbers of people to work in city centres, where current transport capacity constrains it. Increasing the density of employment in the centre of the city will increase productivity even if the total number of people living in or employed in the city overall does not change. Increasing the density of employment in a city centre will reduce the density of employment elsewhere. The Commission’s methodology therefore uses bespoke estimates for the impact (elasticity) of increased density, holding constant the population of the wider Travel to Work Area within which a city centre is located.¹³⁹

By compiling data on a range of variables for different cities over time, statistical techniques can be used to estimate the relationship (‘elasticity’) between economic output (GVA) and city density. When people and firms are close together this has been shown to have a range of benefits, which go some way towards explaining why cities are successful and productive places. Not all the benefits of denser cities are captured through more productive jobs. Denser places also offer a wider selection of services and amenities, which people value (see main text). This is also captured in the Commission’s approach. Figure 3.3 sets out the approach used in *Capturing the value of urban transport investments*.

The assumption that new capacity is fully used will only be valid in the largest cities where rail is a significant commuting mode and where demand is growing. This element of the Commission’s methodology will therefore only be applied to a subset of cities within the region.

Figure 3.3: Approach used in *Capturing the value of urban transport investments*.



Connectivity

Rail can enable benefits of trade between firms in more distant cities by offering faster journeys between city centres. Speed is significantly higher on long distance railway journeys, offering firms a wider choice of potential supply chain partners in high skilled services.¹⁴⁰

The scale of trade benefits can be estimated from the increase in connectivity between cities in the Midlands and the North and other destinations accessed by rail. This approach builds on the connectivity measures set out by the Commission in Transport Connectivity,¹⁴¹ as well as recent academic literature estimating the trade benefits from rail investments.¹⁴² Annex A sets out the list of places that the Commission will consider in the connectivity analysis.

The Commission will consider the impact of the packages of rail investments on connectivity with Scotland. It will also consider connectivity with Birmingham International and Manchester Airport, as the larger airports in the Midlands and the North that are on the rail network and used for business travel.

Box 3.2: The Commission's approach to connectivity

As part of the evidence base for the *National Infrastructure Assessment*, the Commission asked Prospective Labs to construct a set of measures of transport connectivity. The measures assess the effectiveness of the transport network at moving people around the country. Two sets of measures were calculated; urban connectivity (connectivity within places) and inter-urban connectivity (between places), for both public and private transport.

The measures were calculated using the average travel times between two places. The average travel time is divided by the time it would take to travel in a straight line between the places at an assumed speed of 50 km per hour (the crow-flies travel time), as shown below:

$$\text{connectivity} = \frac{\text{(observed travel time connectivity)}}{\text{(crow fly connectivity)}}$$

This metric is then weighted by the demand in each place (population or employment) and calibrated so that places further away are given less weight, to reflect the impact of travel time on willingness to travel.

The metric captures the speed of travel and the directness of the route, weighted by the likelihood that people will want to make that particular journey.

This Commission's approach to connectivity in this assessment is based on this methodology. The Commission intends to calculate inter urban rail connectivity metrics for places in the region. This will enable the Commission to assess the current rail connectivity of places, and how this could change in the future following proposed investments.¹⁴³

Unlocking investment in land around stations

Some of the benefits of agglomeration and connectivity improvements will be capitalised into higher land prices. However, in some cases, there will be an effect on land prices above this. Rail investment, particularly in and around railway stations, can act as an anchor investment, signalling to the market that the location is worth investing in, because other people or businesses are also likely to move there. This helps to solve coordination problems where the value of private sector investment depends on other investors making similar choices.¹⁴⁴

Potential land value coordination benefits will be estimated based on the difference between land values around key station investments, and those in other well connected areas of the same city, considering the extent of proposed densification. These effects will only be expected where land values elsewhere in the city are high, signalling scarcity, and where development will increase density so that scarcity constraints are eased.

Question 2: Given the evidence for how transport impacts growth and competitiveness, is assessing against the Commission’s proposed criteria of productivity, connectivity, and unlocking investment in land around stations a reasonable approach to estimating the impacts of proposed rail investments? Please provide links to any specific sources of evidence you think that the Commission should use to support this methodology.

Sustainability and quality of life

Quality of life has many dimensions. There are many ways that rail impacts quality of life, but some of these are more difficult to quantify than others. The Commission intends to carry out an analysis of the potential impacts of the packages on the following criteria:

- **Amenity benefits:** Many amenities, such as hospitality, entertainment and public services such as specialist hospitals, are in city centres. Increasing access to city centres therefore leads to benefits to people in the surrounding area, who are more easily able to access these services.¹⁴⁵ The Commission is undertaking new analysis to assess how much transport allows people to access these benefits, building on the approach set out in Capturing the value of urban transport investments¹⁴⁶ and based on estimates from academic literature.¹⁴⁷
- **Impact of rail freight:** The Commission will assess the potential impact of rail freight on congestion at key bottlenecks on the rail network and the benefits delivered by different options for freight, including the potential benefits in terms of congestion and carbon emissions.
- **Natural capital:** The Commission will use the University of Exeter’s Natural Environment Valuation Online tool to estimate the order of magnitude of the value of ecosystem services that are lost through construction,¹⁴⁸ and supplement this with any existing route specific research on particular site issues such as habitat connectivity and protected areas.
- **Lifecycle carbon emissions:** The Commission’s analysis will focus on all carbon emissions from packages of rail proposals, including embodied carbon and land use change. The Commission will use data on the amount of materials used by previous rail projects, and projections of industrial emissions for the relevant materials from the Committee on Climate Change’s latest carbon budget advice. To calculate the operational emissions the Commission will use a marginal electricity emissions factor based on previous analysis carried out on renewables and net zero.¹⁴⁹

- **Reliability:** The Commission will also be building on existing analysis to understand the impacts of the packages of rail proposals on reliability of services.

The Commission will also bear in mind the importance of good design across all the packages.

The Commission will also consider differential impacts across different groups in society.

Question 3: Given the evidence for how transport impacts sustainability and quality of life, is assessing against the Commission’s proposed criteria of amenity benefits, impact of rail freight, natural capital, and lifecycle carbon emissions, a reasonable approach to estimating the sustainability and quality of life impacts of proposed rail investments? Please provide links to any specific sources of evidence you think that the Commission should use to support this methodology.

Box 3.3 Calculating the potential impact of rail freight

The Commission will be considering freight impacts as one of its sustainability and quality of life criteria.

The Commission will assess the freight impacts of different interventions on the network by quantifying the impact on congestion and carbon emissions of freight being moved by rail rather than road, particularly at bottlenecks or around ports and distribution centres.

The methodology will not consider the impact of changes in volume of rail freight on economic growth and competitiveness. This is due to uncertainty in projecting volume changes over time, and because any reduction in the volume of rail freight is likely to be offset by an increase in road freight at a similar price.

Understanding the needs and preferences of rail users

The Commission will conduct a programme of social research to understand the needs of both current rail passengers and potential users of future services. This research will explore why existing passengers use the railway and which improvements to their service they would most value. It will also examine what is preventing non-rail users from using the railway and whether any proposed improvements, such as greater service frequency, or more direct services, might encourage them to use new services in future.

Secondly, proposed investment schemes will entail a level of disruption to the current network while delivery is in progress. There is a trade-off between greater levels of disruption to current services and the faster delivery of service improvements. The research will assess what level of disruption passengers are prepared to accept for the faster delivery of improvements and whether any mitigations, such as replacing services with slower direct trains rather than buses, might make disruption more acceptable. This information will support the Commission in considering the needs of existing passengers while developing proposals for the phasing of service improvements.

Sensitivity testing

This methodology captures the potential for transport to support economic growth and is therefore less dependent on the existing characteristics of individual places. However, it does not completely eliminate the challenge of assessing the impact of packages of rail proposals when these are only one of a number of interventions intended to shift places from negative self-reinforcing cycles of deprivation to cycles of success (see Chapter 2). The Commission will therefore undertake sensitivity analysis – testing how much the results change when the inputs and assumptions are varied – to allow for the fact that some inputs in the analysis may themselves change, particularly if the cycle is reversed.

Managing uncertainty

There is an irreducible degree of uncertainty involved in making any large investment decision. Therefore, alongside its assessment of the potential benefits of each package against the criteria listed above, the Commission will also publish a list of what a decision maker would have to accept in order to believe that the potential benefits the Commission is measuring would be realised.

These assumptions are likely to include fairly straightforward, although not certain, assumptions – for example, that other interventions in areas such as skills, governance and local transport are successful – alongside more complex ones such as the assumed impact of city density on skills, or the expected availability of urban transport.

Question 4: Do you agree with the Commission’s proposed approach to uncertainty?

3.4 Presenting options to government

In the final report of this assessment, the Commission will set out the different options for packages, alongside an assessment of the potential benefits of each package against the criteria set out above. Each package will sit within one of the three fiscal envelopes. But each will present a different set of potential benefits. Some may deliver more economic growth and competitiveness benefits, and some more sustainability and quality of life benefits. Some may present a mixture of both, and some packages may benefit certain areas more than others.

Assessing against multiple criteria raises challenges of comparability between different sources of benefits. Conventional approaches to cost benefit analysis weight the different benefits, so they can be summed to a single figure for overall benefits. This has the advantage of being consistent and removes the scope for arbitrary valuations by basing the weights on available evidence.

However, there is often uncertainty on the correct conversion of different benefits into common units. This uncertainty can arise in part from the differing value placed on sources of benefits, due to the contrasting objectives of different stakeholders. This nuance is easily lost when presenting decision-makers with a single overall figure, or even a range, for benefits.

The Commission will seek to reflect different benefits in comparable units where possible, but it is unlikely to be possible for the entire set of criteria. Where direct comparison is not available, the Commission will be transparent about the judgements required to interpret benefits across different criteria.

It will be for government to decide which of the options, or which combination of proposals, best meets the objectives of the Integrated Rail Plan based on their benefits across the different criteria. The government will also need to decide the right budget for rail investments in the Midlands and the North.

3.5 Questions

The Commission welcomes views from stakeholders on the following specific questions about the methodology, as included in the text above. Chapter 4 sets out details on how to respond to these questions.

The Commission will hold a series of roundtables, seminars and discussions with a range of stakeholders throughout the summer to gather views on its methodology and broader approach to the assessment. The final report, setting out an assessment of options for packages for investment in rail in the Midlands and the North, will be published in November.

Question 1: Please provide specific sources for evidence that the Commission could use in estimating costs and the impact of proposals on journey time and capacity.

Question 2: Given the evidence for how transport impacts growth and competitiveness, is assessing against the Commission's proposed criteria of productivity, connectivity, and unlocking investment in land around stations a reasonable approach to estimating the impacts of proposed rail investments? Please provide links to any specific sources of evidence you think that the Commission should use to support this methodology.

Question 3: Given the evidence for how transport impacts sustainability and quality of life, is assessing against the Commission's proposed criteria of amenity benefits, impact of rail freight, natural capital, and lifecycle carbon emissions, a reasonable approach to estimating the sustainability and quality of life impacts of proposed rail investments? Please provide links to any specific sources of evidence you think that the Commission should use to support this methodology.

Question 4: Do you agree with the Commission's proposed approach to uncertainty?

4. How to respond

Responses to the questions in Chapter 3 on the proposed methodology and approach should be sent to the Commission by 15 August. They should be no longer than two pages per question, although precise references to any published material would be welcomed. Responses should be emailed to: **railneedsassessment@nic.gov.uk**

Evidence will be reviewed thereafter by the Commission. If further information or clarification is required, the Commission Secretariat will contact you.

Reflecting government advice, the secretariat is currently working remotely, and will therefore not be able to accept any responses in hard copy. Once a full analysis of responses has been completed, the Commission will engage with organisations where further information is required.

Freedom of information and privacy statements

The Commission may publish any responses received to this call for evidence, excluding any personal data. With regards to your personal data, the Commission will comply with all relevant data protection law, including the General Data Protection Regulation and the Data Protection Act 2018. The Commission may share the information you provide, including any personal data, with other parties in accordance with the relevant data protection law, for example with external analysts for the purposes of consultation response analysis only. The Commission's privacy policy, which provides more details of how the Commission will handle your personal data, can be found **here**.

The Commission is subject to legal duties which may require the release of information under the Freedom of Information Act 2000 (FOIA) or any other applicable legislation or codes of practice governing access to information. Therefore, information provided in response to this consultation, including personal information, may be subject to publication or disclosure in accordance with the FOIA or other relevant legislation. If you would like the information that you provide to be treated as confidential please be aware that, under the FOIA, there is a statutory code of practice with which public authorities must comply and which deals, amongst other things, with obligations of confidentiality.

In view of this, it would be helpful if you could explain to the Commission why you regard the information you have provided as confidential. If the Commission receives a request for disclosure of the information, it will take full account of your explanation, but cannot give an assurance that confidentiality can be maintained in all circumstances, as a result of its legal duties under the FOIA. Please note that an automatic confidentiality disclaimer generated by your IT system will not, of itself, be regarded as binding on the Commission.

Annex A: List of Travel to Work Areas and other places included in the connectivity analysis

This annex contains a list of the Travel to Work Areas in the Midlands and North included in the Commission's connectivity analysis for the Rail Needs Assessment. Given that there are 75 Travel to Work Areas located in the Midlands and North, this list is based on including Travel to Work Areas with a population of over 150,000 (from the **2016 ONS estimate**). A smaller subset of this list of places will be included in the Commission's productivity and amenity impacts analysis.

Also note that for each Travel to Work Area, any key stations within that area will be included in the analysis, rather than a single station. For larger cities, this is multiple stations.

The Commission has included seven Travel to Work Areas in Scotland to support its consideration of delivering connectivity with Scotland. The Commission has also included airports in the Midlands and North with over 10 million passengers (from **Civil Aviation Authority data in 2019**).

Midlands and North

Barnsley	Crewe	Leamington Spa	Preston
Birkenhead	Derby	Leeds	Scunthorpe
Birmingham	Doncaster	Leicester	Sheffield
Blackburn	Dudley	Lincoln	Shrewsbury
Blackpool	Durham and Bishop Auckland	Liverpool	Stafford
Blyth and Ashington	Grimsby	Manchester	Stoke-on-Trent
Bradford	Halifax	Mansfield	Sunderland
Burnley	Harrogate	Middlesbrough and Stockton	Telford
Burton upon Trent	Hereford	Newcastle	Wakefield and Castleford
Chester	Huddersfield	Northampton	Warrington and Wigan
Chesterfield	Hull	Nottingham	Wolverhampton and Walsall
Coventry	Kettering and Wellingborough	Peterborough	Worcester and Kidderminster York

Airports

Birmingham International	Manchester Airport
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Scotland

Aberdeen	Edinburgh	Inverness	Falkirk and Stirling
Dundee	Glasgow	Perth	

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20 Miles More	Black Country Local Enterprise Partnership	Cheshire East Council
Aaron Bell MP	Blackpool Council	Chesterfield Borough Council
Action for Yorkshire Transport	Bradford City Council	Chesterfield Canal Trust
AECOM	British Chambers of Commerce	Commercial Estates Group
Alec Shelbrooke MP	Buro Happold	Confederation of British Industry
Alstom UK & Ireland	Cadent	Councillor Martin Gannon, Chair NE Joint Transport Committee
Andrew Bridgen MP	Campaign for Borders Rail	Coventry and Warwickshire Local Enterprise Partnership
Angel Trains Ltd	Campaign for the Protection of Rural England	Craig Whitaker MP
Ashby Canal Association	Capita	Croft Parish Council
Ashby Canal Trust	Coldwell Banker Richard Ellis Limited	Culcheth and District Rail Action Group
Ashfield District Council	Chartered Institute of Logistics and Transport	Culcheth and Glazenbury Parish Council
Association of British Ports	Cheshire and Warrington Local Enterprise Partnership	Cumbria County Council
Atkins	Cheshire Association of Local Councils	Cumbria Local Enterprise Partnership
Bechtel		
Birmingham Airport		
Black Country Chamber		

Cumbrian Community Rail Partnerships	Holly Lynch MP	Liverpool City Region Combined Authority
D2N2 Local Enterprise Partnership	Howard Pack Consulting	Lord Patel of Bradford
David Brice Consultancy Ltd	HS2 Ltd.	Lord Shutt of Greetland
Department for Transport	Hull & East Riding Rail Users' Association	Lord Wallace of Saltaire
Derby City Council	IFPA	Mace Group
Derbyshire County Council	INECO	Manchester Airports Group
Derbyshire County Council	Inland Waterways Association	Manchester and East Midlands Rail Action Partnership
East Coast Main Line Authorities	Institution of Civil Engineers	Manchester City Council
East Midlands Chamber	Institute for Public Policy Research North	Mid Cheshire Rail Users Association
East Midlands Councils	Jack Brereton MP	Midlands Connect
East Midlands Local Enterprise Partnerships	Jacobs	Minsters Rail Campaign
Eversholt Rail	Jason McCartney MP	Mott MacDonald
Expedition Engineering	Jo Gideon MP	Muslims in Rail
Fabian Hamilton MP	Jonathan Gullis MP	National Farmers' Union
Gazeley	Judith Cummins MP	National Trust
Greater Birmingham and Solihull Local Enterprise Partnership	Kevin Hollinbrake MP	Natural England
Greater Birmingham Chambers of Commerce	Kilbride Holdings Limited	Network Rail
Greater Lincolnshire Local Enterprise Partnership	Lakes Line Rail Users Group	Nexus
Greater Manchester Combined Authority	Lancashire Country Council	Nichols Group
Greengauge 21	Lancaster City Council	Nigel Adams MP
Halifax & District Rail Action Group	Lee Rowley MP	North Cheshire Rail Users Group
Harworth Group Plc	Leeds City Council	North East Combined Authority
High Speed Rail Group	Leeds Civic Trust	North East England Chamber of Commerce
Highways England	Leeds Studio	North of Tyne Combined Authority
Historic England	Leicester and Leicestershire Local Enterprise Partnership	North West Leicestershire District Council
HM Treasury	Leicestershire County Council	Northern Powerhouse Partnership
	Leicester City Council and Leicestershire County Council	

Nottingham City Council	Staffordshire Chambers of Commerce	Welsh Local Government Association
Nottinghamshire County Council	Staffordshire County Council	West Midlands Combined Authority
Ormskirk Preston	Stockport Council	West Midlands LEP Chairs
Ove Arup	Stoke on Trent City Council	West Midlands Rail Executive
Park Lane Group	Stoke-on-Trent and Staffordshire Enterprise Partnership	West Yorkshire Combined Authority
Peel Group	Tatton Group	Weston Williams and Partners
Pickmere Parish Council	Tees Valley Combined Authority	Wigan Council
Plastic Omnium	The Marches Local Enterprise Partnership	Woodland Trust
Port of Tyne	The Piece Hall	Worcestershire County Council
Porterbrook	The Wildlife Trusts	Worcestershire Local Enterprise Partnership
Rail Delivery Group	Tracy Brabin MP	WSP
Rail Forum Midlands	Trafford Council	Yeme Architects
Rail Freight Group	Transport Focus	Yorkshire and Humberside Green Party
Rail Future	Transport for Greater Manchester	Yorkshire Rail Campaign
Railway Industry Association	Transport for the North	
Royal Society for the Protection of Birds	Transport for West Midlands	
Rt Hon Hilary Benn MP	Travel Watch North West	
Rt Hon Karen Bradley MP	Tritax Symmetry	
Settle Carlisle Railway Development Company	Trucktrain Developments Ltd	
Sheffield City Council	Turner and Townsend Project Management	
Sheffield City Region Combined Authority	Tyne Valley CRP	
Siemens	UK Major Ports Group	
SKA Developments	UK2070 Commission	
Skipton-East Lancashire Rail Action Partnership	Urban Growth Company	
Solihull Metropolitan Borough Council	Vastint	
Southport Travellers' Association	Warrington Borough Council	
	Waxwing Engineering Ltd	

Endnotes

- 1 The places included on this map are Travel to Work Areas in the North and Midlands with an estimated population in 2016 of over 400,000 (Office for National Statistics (2016), **Travel to Work Area analysis in Great Britain**). Where Travel to Work Areas are a combination of places, we have labelled the larger city only. The chart shows population, as of 2016 (Office for National Statistics (2016), **Travel to work area analysis in Great Britain: 2016**) per Travel to Work Area and the station entries and exits in the city centre stations within that Travel to Work Area in 2018/19 (Office of Rail and Road (2019), **Estimates of station usage**).
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