

September 2024

Opportunity through connectivity

Catalysing economic growth through a Midlands-North West Rail Link

ARUP

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Foreword from Sir David Higgins



Sir David Higgins

In October 2023, in the face of escalating costs, the Government took the decision to cancel the second phase of HS2 between Birmingham and Manchester.

The Mayors of the West Midlands and Greater Manchester asked me to support them in reviewing the impacts of this decision and the opportunities for moving forward. This report focuses on the rail link between Handsacre, north of Birmingham, through to Crewe and then onto High Legh near Manchester Airport.

I have overseen a diverse private sector team, led by Arup and supported by Addleshaw Goddard, Arcadis, Dragados, EY, Mace and Skanska, to produce this report with no cost to Government. We strongly recommend that the newly elected Government preserve the existing powers and land safeguarding, and spend the next six months working in partnership with the Metro mayors and the private sector to develop a detailed strategy for delivering critical change.

The Victorians knew how essential transport was for wealth creation across the nation. The West Coast Main Line, built in sections for Queen Victoria's coronation in 1838, was critical to economic growth in the Midlands and the North West of England. The original alignment, gauge, tunnels and embankments designed for the first steam engines are still in use today. The resilience and reliability of this line is now very poor. The May 2024 National Infrastructure Commission's (NIC) infrastructure progress report states, 'The West Coast Main Line is one of the busiest in

Europe already running at a higher intensity of operation than major fast lines in European countries impacting reliability.' This report highlights productivity comparisons between this region and ones in Europe, and draws the link between poor connectivity and the factors that inhibit economic growth.

The design for HS2 was developed as an integral part of the UK's national and international passenger and freight network for the next 50 plus years. The decision to cancel Phase 2 creates a gap in one of the most critical parts of this overall network. As the NIC report states, 'A do nothing scenario north of the proposed termination of HS2 at Handsacre is not sustainable. The existing infrastructure is a constraint on future passenger and freight growth.'

In addition to passenger capacity, Phase 2 of HS2 was planned to release significant freight capacity on the existing West Coast Main Line between Nuneaton (where freight coming to / from Southampton and Felixstowe meets the WCML) and major multimodal freight facilities at Basford Hall. The decision to cancel this section significantly inhibits this plan.

The first section - Phase 2A from Handsacre to Crewe - already has planning powers and a significant proportion of land has been purchased. These complex powers took over four years to approve, and the land acquisition powers will, without intervention, lapse in the next two years (followed by the project's planning consents a few years later, in 2031). This section is the easiest to build and should be by far the cheapest because of limited tunnelling and viaduct construction, and there are no railway stations.



HS2, like many other major projects worldwide, has experienced significant cost pressures in recent years, due to a wide range of factors. When costs escalate in the way they have, it is essential to reconsider both the design specification and also the risk sharing mechanisms with contractors. This report also explores in detail the options for change to the current design and different delivery models.

Finally, the report reviews new models for funding involving both the private and public sector and drawing on examples of major

international rail projects. The August 2024 Rail and Urban Transport Review, led by Juergen Maier, reinforces many of our conclusions about the need for a new way of delivering the infrastructure our nation so clearly needs.

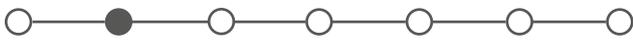
A high-capacity, resilient passenger and freight rail network linking major economic centres in this country will be essential for long-term economic growth in the United Kingdom – enabling new housing, building new skills, driving innovation, and enhancing social mobility.

Sir David Higgins.

Summary of our requests of Government

This private sector coalition has come together at its own cost, with the support of the two Metro Mayors, to form a proposal for a **Midlands-North West Rail Link**. To move this forward, we are asking the Government to undertake the following:

1. Establish a Steering Group between the private sector, Combined Authorities and Central Government to drive forward development of an 'at pace' feasibility study and technical analysis over the next six months:
 - Working with the newly-established British Infrastructure Council to convene global private sector investors to attract investment into this critical link, and use this as an opportunity to re-position the UK as a country open to institutional investment in infrastructure;
 - Undertaking further financial, commercial, and economic analysis to develop an investment prospectus for the private sector, and optimise value for money across all rail investments for the public sector;
 - Working closely with Network Rail, HS2 Limited and other bodies to advance the technical specification further; and
2. Critically we need time to get this right, and support from the Government to work with us on the activities above, building on the work we have done to date. The Government could help the private sector advance technical and commercial solutions by:
 - maintaining ownership of the current landholdings on the former Phase 2A route from Handsacre to Crewe while this work is underway; and
 - reinstating safeguarding for the land not yet acquired on this route; protecting and prolonging existing planning powers; and maintaining flexibility to reincorporate the Crewe to High Legh segment into the repurposed NPR Hybrid Bill while a new solution is finalised and agreed.
3. Formally consider the network-wide benefits of this proposition alongside proposals for enhancing east-west connectivity in the North and the economic benefits this would bring to the whole of the UK.



Introduction

The UK stands at an inflection point. We have incredible social and economic assets – vibrant cities, leading global universities, world-class air and seaports, and a thriving life sciences sector. But having been mired in persistently low-growth and low productivity for over a decade, our economy is underperforming many of our peers. We are also one of the most spatially unequal societies in Europe, with a significant gap in economic output and living standards between the South East and the Midlands, the North West, and other regions.¹

These trends are directly connected: restoring geographical balance to the UK economy is a critical step to driving higher average productivity and sustainable economic growth for the nation.² The tangible outcomes from this growth for the people and places of the Midlands and the North are what really matters, beyond the statistics. Better jobs, better prospects, better housing, and better local amenities are the things which ultimately enable a better quality of life.

The question is not whether we need to do this, but how we can best achieve it. On this, the evidence both from across the globe and here in the UK is unambiguous: high quality, affordable infrastructure is the best recipe for stimulating economic activity³, and transport is the key ingredient – spanning the movement of both people and goods.

Delivering this connectivity in an effective, affordable way is the central challenge at the heart of this report.

One of the reasons for this poor economic performance in recent years is low levels of investment in the UK economy... Investment in transport networks can enable sustainable trips within and between cities — the main engines of economic growth.

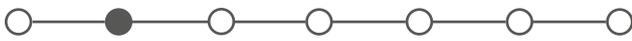
— National Infrastructure Commission, *Second National Infrastructure Assessment, 2023*

More fundamentally, we are acutely aware of the UK's urgent need for a new infrastructure delivery model that addresses persistent challenges around high costs and inefficient delivery. Evidence is mounting that the UK is particularly afflicted by these challenges⁴, which has resulted in the nation spending less on infrastructure than our peers – against a substantial backlog of investment needs.⁵

We all have a role to play in thinking differently to develop this new model – this includes businesses, political leaders (including Metro Mayors), central and local governments, and investors. We must find a better way of bringing together the best of the public and private sectors to deliver the much-needed infrastructure that will power the next century of growth in the UK.

With the election of a new Government, now is the time to take a fresh approach.





Context and background to this review

The past year has brought significant change in Government transport policy and investment plans, with further change to come following the July 2024 election of a new Labour-led Government.

In October 2023, the previous Government announced the decision to cancel HS2 Phase 2 in response to escalating cost and delivery concerns. This resulted in a programme of high-speed rail (HSR) works focused only on the section between London and Birmingham, with the Birmingham to Manchester leg cancelled. The decision included a commitment to reallocate the Phase 2 funding to a broader package of transport enhancements, including additional funding to continue the NPR project that will improve connections between northern cities.

In late 2023, the Mayors of the West Midlands and Greater Manchester came together to develop a response to these decisions. The Mayors asked a coalition of private sector organisations to undertake an independent evaluation of this new context and to set out a path forward.

This group, chaired by Sir David Higgins and led by Arup, alongside Addleshaw Goddard, Arcadis, Dragados, EY, Mace, and Skanska, brought together world-class expertise in economics, rail planning and engineering, infrastructure finance and planning law, and construction. In addition to our individual strengths, the group was uniquely well-placed to offer a fresh perspective on the development of a new model for UK infrastructure planning and delivery. This report is the product of our work.*

Our underlying aim has been to take a ‘place-led’ approach to the questions below, one which respond to the particular growth ambitions, economic and social assets, and other characteristics of the West Midlands and Greater Manchester. We wanted to focus on ‘what do the people and businesses in these places need?’, rather than starting from the perspective of ‘what sort of infrastructure can we build?’

* In keeping with the intent for this work to offer an independent and private sector-led voice, the perspectives contained in this report are solely those of this group, and not the West Midlands Combined Authority, Greater Manchester Combined Authority, or any other public entity. The review is based wholly on publicly available information and professional expertise.

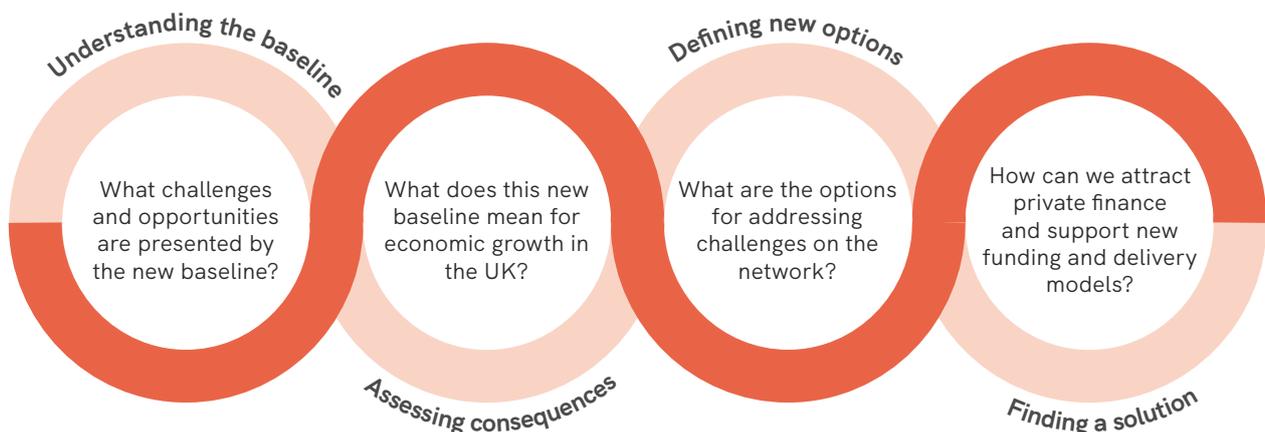


FIGURE 1: Key questions guiding this review



Focus of Review

FIGURE 2: Review focus

*The NPR route is a mix of new and upgraded railway lines. The precise route has not yet been confirmed by the Government. The route shown on this map is an indicative assumption.



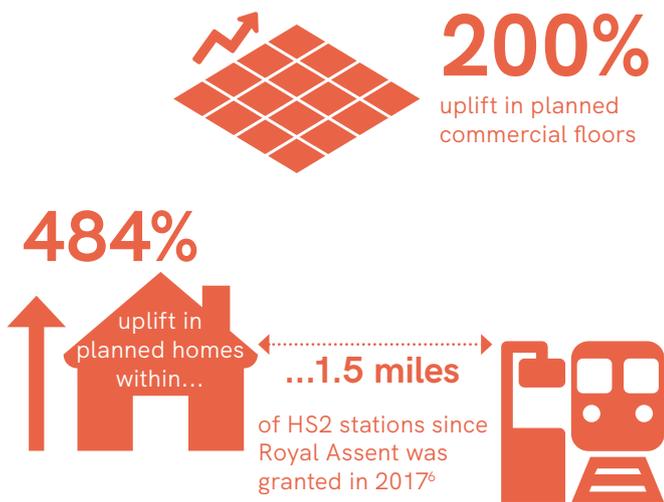
City-region connectivity challenges and opportunities



Emerging blueprint of national connectivity improvements

The package of rail network investments proposed by the previous Government was aimed at boosting both national and local connectivity and economies. Before even opening, the **HS2** connection between London and Birmingham is already accelerating investment in the West Midlands.

- Across the East and West Midlands via the **Midlands Rail Hub**, enhancing connectivity between Birmingham, Derby, Leicester, Nottingham, Worcester and beyond to the South West and South Wales.
- Within city-regions through investment in urban passenger transport and freight networks as part of the **City Region Sustainable Transport Settlements (CRSTS)**.



Other major projects announced by the previous Government have the potential to deliver similar benefits:

- Across the North West and Yorkshire regions via **Northern Powerhouse Rail**, enhancing connectivity between Liverpool, Manchester, Leeds and Northern cities.

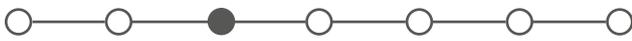
These ongoing and planned investments are to be welcomed. They are critical to the economic health of the nation and will greatly improve capacity and connectivity between and within cities.* The new Labour Government has also started articulating a transport investment strategy focused on growth.

But despite their benefits, the current investment blueprint leaves two key gaps where, following the cancellation of HS2 Phase 2, existing connections are insufficient to accommodate long-term projected growth in demand. The shortfalls are harmful in their own right, but left unaddressed pose a wider problem, threatening to hold back the transformational potential of HS2, NPR, Midlands Rail Hub and CRSTS.

These gaps are the corridor from Birmingham and the West Midlands to Manchester and the North West (western gap), and the corridor from the Midlands to Sheffield and Leeds (eastern gap).**

* The analysis undertaken for this review makes an assumption that these commitments are delivered in full, including connecting HS2 Phase 1 to Euston Station, and ensuring Euston is appropriately sized to accommodate additional services running north of Birmingham.

** The May 2024 report from the National Infrastructure Commission highlights these two missing links. As an urgent response to the most recent changes in Government policy sponsored by the Mayors of the West Midlands and Greater Manchester, this review is focused on the first of these gaps. However, we recommend that both are considered to be of major strategic importance, and that the Combined Authorities, working with the newly-elected Government, will explore how they can be remedied.



Assessment of current connectivity

The western gap – and the focus of this review – falls in the centre one of the UK’s most important economic corridors. It connects most of the largest population and economic centres in Britain together, including London, Birmingham, Manchester, Liverpool, Glasgow, and Edinburgh. It is also a key freight route to and from major seaports, airports, and the critical logistics hub in and around the West Midlands.

The principal spine for this corridor is the West Coast Main Line (WCML), one of the nation’s most important passenger and freight railways. It is also one of the oldest, dating back more than 150 years in many places.

Passenger demand on the line has more than doubled following modernisation works in the 2000s⁷, to roughly 35 million intercity journeys per year, making it one of the busiest rail lines in Europe.⁸ More than 40% of all goods moved in the UK use the route.⁹

This rapid growth in demand means that the line is now once again operating close to the limit of its train-carrying capacity, due to a series of major bottlenecks between Birmingham and Manchester, illustrated in Figure 3. These constraints not only limit the WCML’s future ability to accommodate more trains – and therefore more passengers and freight – but also place significant pressure on the performance of the railway today. It is currently the least reliable railway in Britain, with fewer than 50% of trains operating on-time.¹⁰

SPOTLIGHT

The **Shugborough Tunnel** is one of the key bottlenecks on the WCML. This tunnel dates to 1846 and constrains capacity on the whole line, due to it only being wide enough for two tracks, with no viable means of providing additional tracks through the area.

This is a key example of how design and engineering choices made during the Victorian era are still impacting the capacity and operations of services today. Many of these constraints have no easy solutions as the ‘low hanging fruit’ has largely already been dealt with.

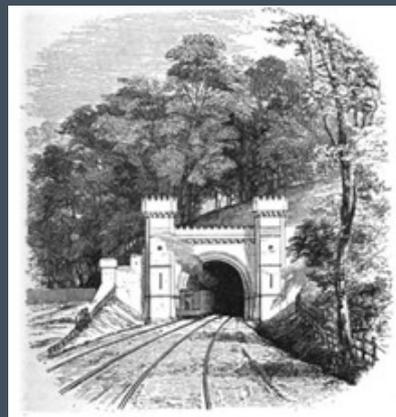


Illustration of Shugborough Tunnel

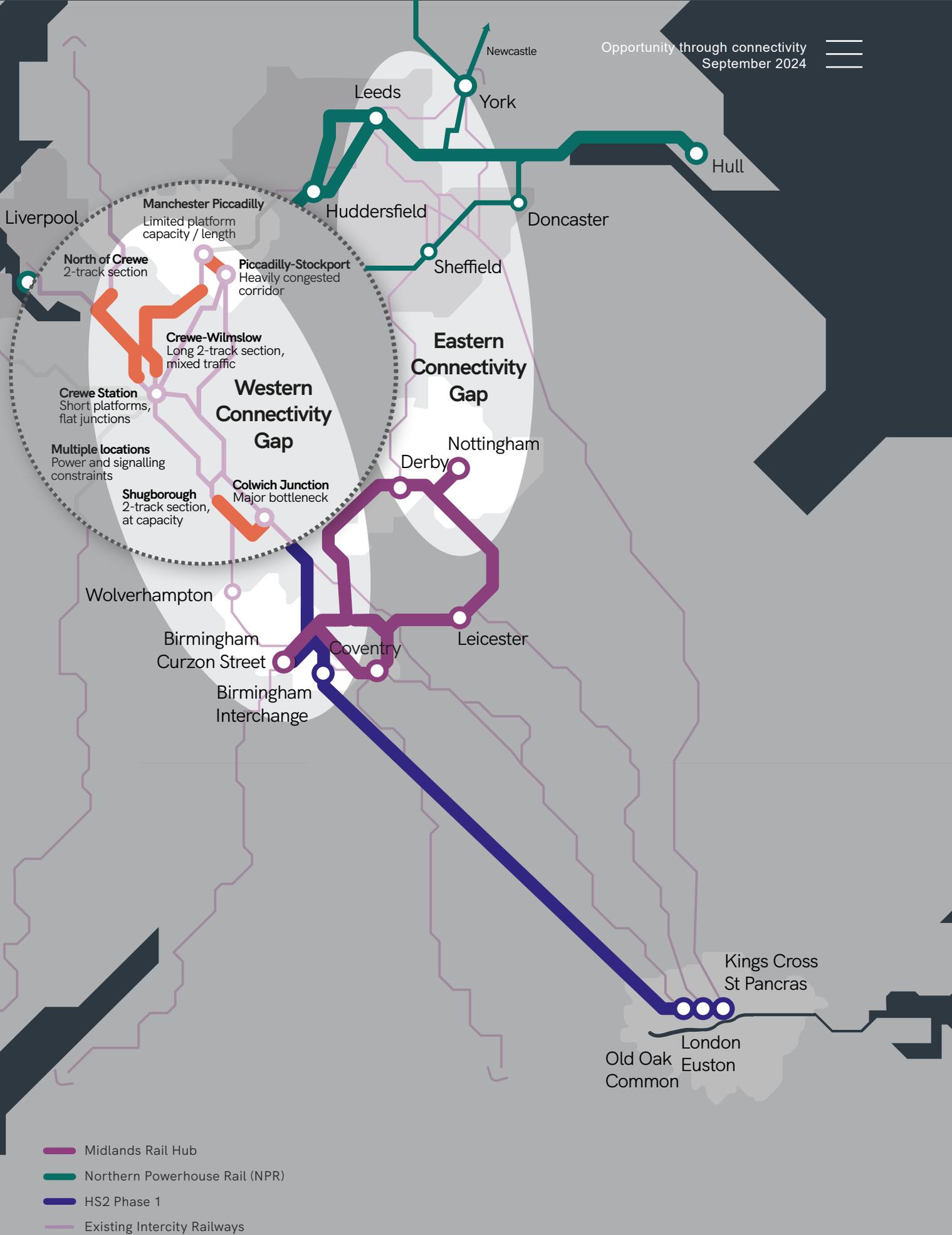
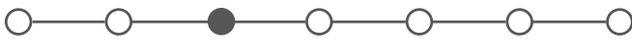


FIGURE 3: Gaps and constraints



SECTION 1

Prior to the Covid-19 pandemic, passenger volumes were growing by c.6% annually over the previous 13 years. The original HS2 business case projected that growth in demand would continue to be robust, and that significantly greater capacity would be needed on the corridor by the late 2020s.

The pandemic altered this trajectory, and changes to travel patterns have delayed the date when the railway reaches its full capacity. However, we have examined a number of growth scenarios based on an estimate of the current, post-Covid passenger levels, and can state with confidence that **within the next decade, travel demand on the London-Manchester corridor will exceed the maximum capacity of the line.** This is true even in a scenario where growth remains well-below historical averages (essentially just keeping pace with population growth).

The NIC's May 2024 analysis came to similar conclusions. It found that 'by 2045 Birmingham could have between 23 and 61 per cent more passenger arrivals during the morning peak than in 2019, Manchester between 5 and 38 per cent... Without uplifts in capacity, this could lead to significantly worse crowding outcomes.'

It is not just passenger rail services that are facing demand and capacity challenges. Growth in daily freight trains is expected to reach 74%

by 2043/44 and certain route sections on the WCML are forecast to carry over 120 daily freight trains compared to 60 trains today. This potential growth, and the associated carbon benefits of moving more goods by rail, will be unachievable with the current capacity constraints.¹¹

The key roads serving this corridor are also under strain. The M6 is one of the most heavily used routes in the nation for both cars and lorries, with some sections carrying upwards of 150,000¹² vehicles per day, and official projections anticipating much higher volumes in coming decades.¹³ Even at current traffic levels, congestion and delay is routine.

This means both the strategic road and rail routes connecting the western side of the UK are already operating close to the limits of their capacity, with major infrastructure bottlenecks that cannot easily be resolved. Forecasts predict further growth in demand, which will inevitably cause severe crowding, congestion and unreliability – or simply suppress further growth in travel along with economic activity.



FIGURE 4: Estimated date of demand exceeding capacity under three growth scenarios.



Conditions following the opening of HS2 Phase 1

The business case for the full HS2 programme was predicated in large part on addressing these challenges; with HS2 Ltd often referencing the 'three C's' underpinning its aims - capacity, connectivity, and carbon. This business case also confirmed that upgrading the WCML would be hugely disruptive and not provide the required capacity to solve these challenges.

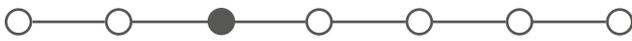
The cancellation of HS2 Phase 2, from Birmingham to Manchester, now means that we have a new line between London and Birmingham and an expectation that HS2 services operating north of Birmingham will use existing tracks and mix with non-high speed services. New HS2 trains operating at 400m length will be able to run between London and Birmingham - but beyond Birmingham to the North West, the WCML infrastructure is only able to accommodate 200m trains.

Furthermore, the new HS2 trains will be limited to lower operating speeds than existing Pendolino trains, creating further complications for timetabling and capacity management on congested sections of the railway.

This means the operating environment for the WCML will soon become incredibly complex. Already constrained by Victorian infrastructure, the route will need to accommodate a mix of rolling stock, drawing on different power and signalling systems. Adding the complexity of interfacing HS2 and WCML infrastructure, and the need to slot high-speed services onto the main line all introduces significant operational challenges and performance risks.



Council House Clock Tower, Birmingham.



SECTION 1

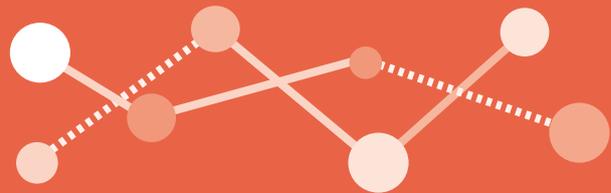
We have assessed the implications of only building Phase 1 of HS2 (London-Birmingham) and what this now means for service along the full London to Manchester route.*



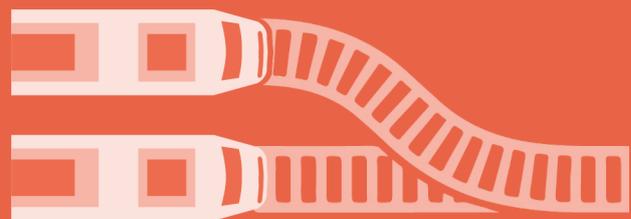
While HS2 will significantly boost seat capacity between London and Birmingham, adding over 3,000 seats per hour, it will not increase the number of trains per hour north of Birmingham due to the infrastructure constraints that remain unresolved without the later stages of HS2. In fact, where current 11-car class 390 (Pendolino) trains are due to be replaced by high-speed trains, the number of seats will reduce. High-speed trains can only run north of Birmingham if they replace existing services.

* Within the rail industry, detailed options are being considered as part of ongoing understanding of how to progress the current situation and address the challenges highlighted here, including potential rolling stock strategies.

** The extent of reduced connectivity depends on the number of existing services that are replaced with HS2 services (this is not yet agreed and depends on trade offs of speed, capacity and connectivity for intermediate stops). The more existing services that are replaced with HS2 services, the worse the connectivity gets for those places no longer served.



Previous plans would have allowed for some existing WCML services between Manchester and London to continue to run alongside new HS2 services. However, as there are no longer plans to provide new platforms at Manchester Piccadilly for HS2 trains, and due to the other capacity constraints on the WCML, this will no longer be possible. This means current intercity services between Milton Keynes, the Trent Valley, and potentially** Stoke-on-Trent will no longer operate, resulting in a **material reduction in regional connectivity** between many fast-growing communities along the current WCML corridor.



With bottlenecks and capacity constraints north of Birmingham left unaddressed, the capacity for increased freight services will remain constrained. Sections of the WCML north of Lichfield will not be able to support any significant increase in freight capacity to the North, Wales and Scotland, impinging on the aims of the national freight strategy and severely limiting the expected freight-related benefits from the HS2 investment.



Implications for economic growth



Catalysing growth in the West Midlands and Greater Manchester is critical to the UK's economic future

As businesses that operate in multiple markets across the world, we have a clear-eyed view of the UK's economic strengths. The nation - home to the world's sixth largest economy - remains a vital global trading hub and is a leader across many sectors that will drive growth and innovation in the decades ahead, including life sciences, AI, fintech, low-carbon technology, and more.

However, in an environment of economic insecurity, low investment and stagnant growth, maintaining and enhancing this position, and increasing economic output, productivity and competitiveness, will require smart policymaking and targeted investment.

The UK has grappled with slow productivity growth for many years. Despite its strong assets, the productivity challenge has been particularly acute in Greater Manchester and the West Midlands. Large urban areas around the world often have productivity levels that equal or exceed their national average but this is not the case with our two second cities.¹⁵

Productivity in Greater Manchester, measured by GDP/worker, sits 13% below the UK average. In the West Midlands, productivity is 24% below the national average.¹⁶

High quality, affordable infrastructure is key to stimulating economic activity¹⁷, and transport sits at the heart of this. Strong connectivity is essential to a prosperous future for our country and its towns and cities, alongside investment in skills, housing, research and innovation, and quality of place.

Well-developed and reliable transport networks enable the spatial redistribution of knowledge-intensive jobs from large capitals to secondary cities, expanding access to labour pools, attracting inward investment, and facilitating better coordination between complementary high-productivity sectors. They allow businesses to thrive by enabling deeper market integration, freight and logistics growth and supply chain expansion. They also allow people to connect better with one another, strengthening community ties and social cohesion, and making city centre regeneration more viable.

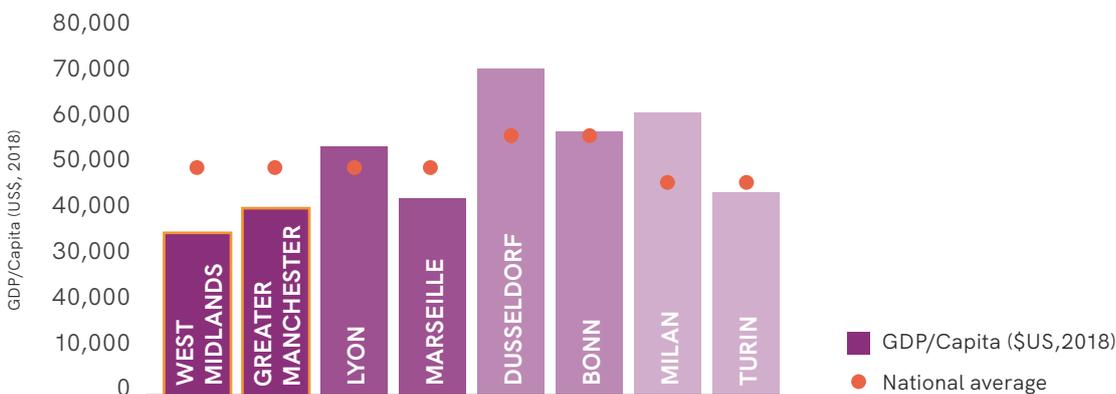


FIGURE 5: Productivity across comparator European city pairs (OECD data for the Functional Urban Areas of each city-region; note that FUA boundaries do not correspond precisely to the UK Combined Authority boundaries)



SECTION 2

City centre accessibility across Britain's secondary cities is currently well below the European average for similar places.¹⁸ To realise the full potential of committed and future investments, improved urban connectivity is needed to make cities like Manchester and Birmingham, and the regions that surround them, more accessible and attractive for employment and investment.

Greater Manchester and the West Midlands have the greatest capacity for economic growth within the UK economy. These urban areas have achieved the fastest population growth in the country over the past decade,

outside of London.¹⁹ Delivering the 'missing link' between them is critical to unlocking higher productivity and helping the nation achieve priorities to rebalance the country and drive green growth.

Bringing the Manchester and Birmingham city regions up to par with the UK average productivity would add £43bn, approximately 2%, to the UK economy annually. But this bonus could rise to £70bn if the regions were to match the performances of their peer European cities relative to their country averages.

CASE STUDY

Inter-regional connectivity has been key to unlocking the competitiveness of secondary city pairs across Europe.

In France, clusters of new knowledge businesses have moved from Paris to the south-eastern cities of Lyon and Marseille since the introduction of HSR. The region has experienced a 46% increase in knowledge-based activities between 1999-2009.²²

In Germany's Rhine-Ruhr region, stronger HSR links have supported the transformation of Dusseldorf and Bonn into 'global pipelines' for the wider region, attracting a high concentration of advanced manufacturing firms and knowledge-based companies.²³

On the Milan-Turin axis in northern Italy, HSR has facilitated coordination between training and research facilities, with growing integration of polytechnic universities and knowledge-intensive business services.²⁴

The disaggregation of knowledge and high-skilled labour has enabled secondary cities to outperform their national productivity levels by reducing the cost of transporting skills and capital to non-capital cities.

The city pairs described above are on average 14% more productive than their respective national levels, bolstering France, Germany and Italy's position as key global economic players.

Delivering improved intercity connectivity could bring huge opportunity for city-centre regeneration around central stations in Manchester and Birmingham. In Manchester, there is capacity to deliver up to 13,000 new homes and 820,000 square metres of new commercial development in the area surrounding Piccadilly Station, and further development opportunity around Manchester Airport, the UK's largest airport outside London.²⁰

In Birmingham, new development in the Curzon Station area could exceed 800,000

square metres and 4,400 homes could be delivered.²¹ Investment in strategic urban and intercity transport will provide a focal point for coordinating investment, unlocking land in strategic development areas to make city centre regeneration more viable.

HS2 Phase 1, Midlands Rail Hub, and Northern Powerhouse Rail will all play key roles in unlocking this growth opportunity. If all of these are effectively linked they could deliver a transformation that is greater than the sum of the individual projects.

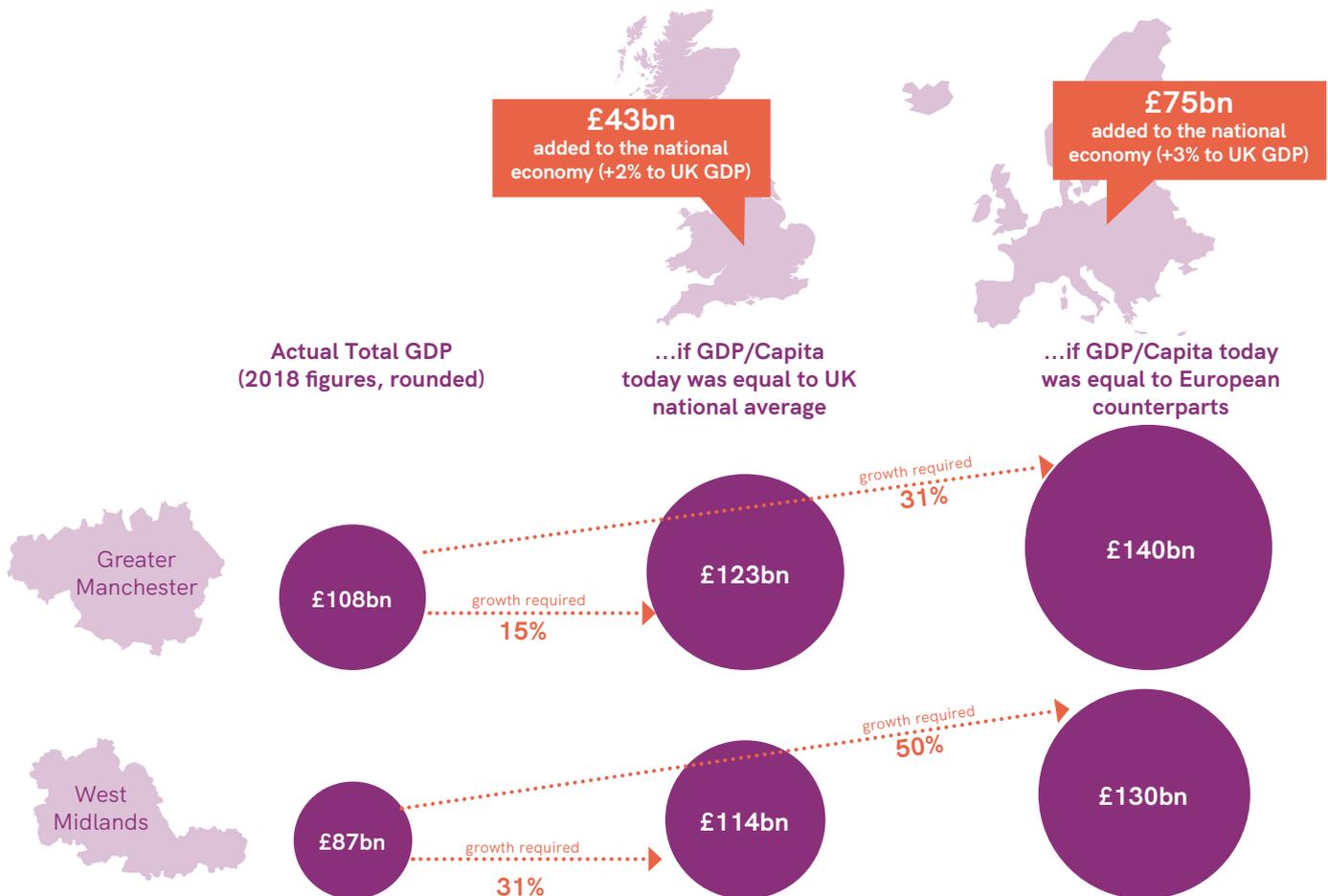
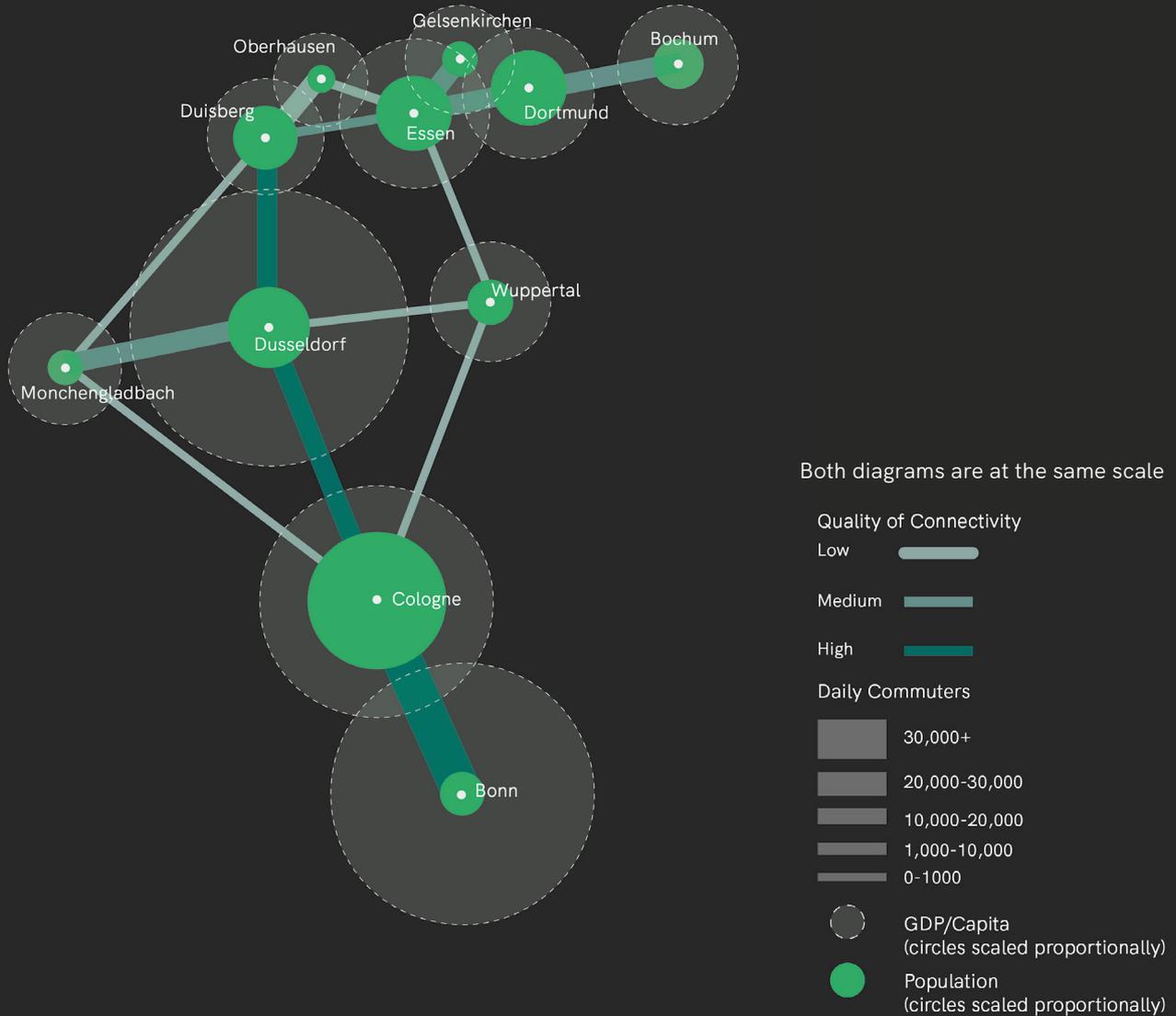


FIGURE 6: Potential value-add of improving productivity in Greater Manchester and the West Midlands. Note: based on OECD data for Functional Urban Areas, which differ slightly from the Combined Authority boundaries. Totals and percentages may not sum due to rounding.

A tale of two regions...

Rhine-Ruhr, Germany



There are many similarities between the UK region centred around the West Midlands and Greater Manchester, and the Rhine-Ruhr region in northwest Germany.

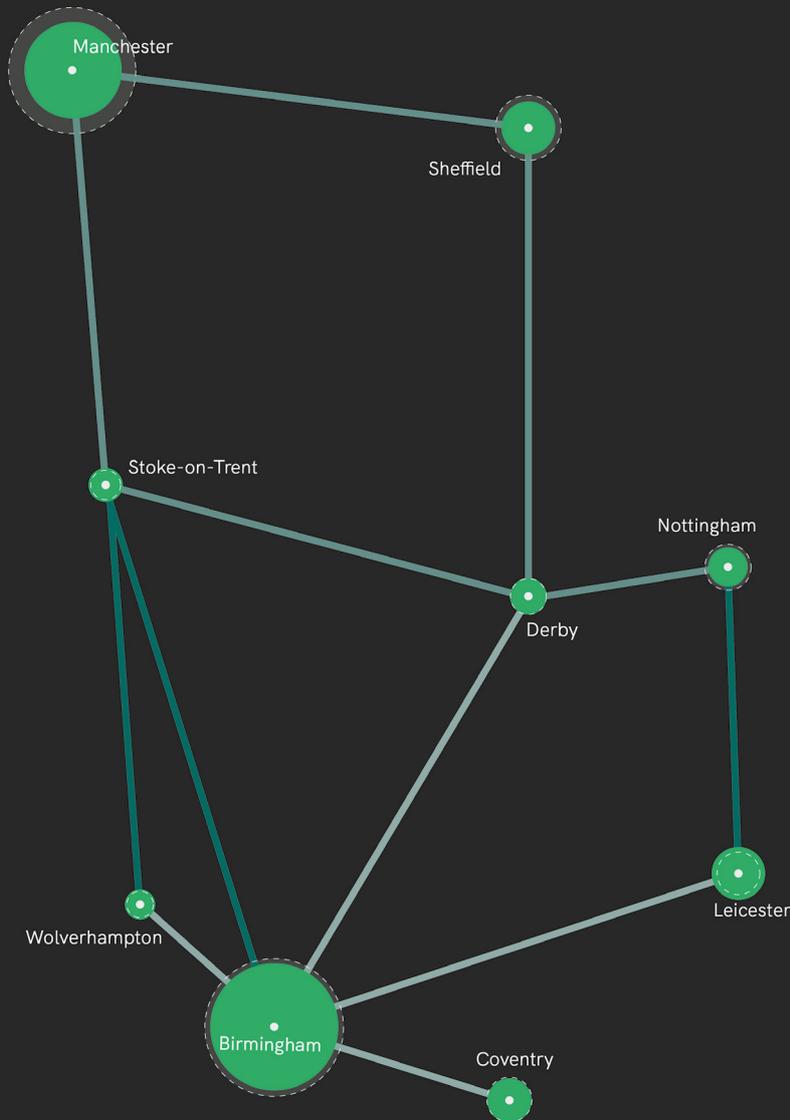
Both are polycentric regions, with multiple nodes of economic and social activity across a series of large towns and cities, each with their own unique identity. Both have roughly equivalent populations (c.11-13 million people). They have similar 'inland' geographies, and are connected by railways, canals, and rivers, with similar distances between the major conurbations. And both

held positions as the industrial heartlands of their respective countries for many decades, before going through a painful deindustrialisation process starting in the mid-20th century.

However, there is one stark difference – the Rhine-Ruhr has become an economic powerhouse, second only to Paris in the EU, with thriving services, exports, technology, energy, logistics and life sciences sectors. Economic output across the region's major cities is roughly 70% larger than across major cities in the corresponding UK region



Greater Manchester, South Yorkshire and Midlands, UK



(GDP across the Rhine-Ruhr's major cities was approximately £226bn compared to £132bn across the West Midlands and Greater Manchester), with living standards (in terms of GDP per capita) over three times higher.

The Rhine-Ruhr functions as a much more economically integrated place than its UK equivalent, with significant labour flows between towns and cities. Although the places within the Rhine-Ruhr do 'compete' with one another economically, they also have their own complementary specialisms, for example Cologne in the automotive industry, Essen in energy, and Dortmund in technology and digitisation.

This success is due to a wide range of factors, including sustained and consistent policy and investment from the German Government over several decades, spanning skills and education, housing, industrial strategy, and more. But the quality of connectivity between the nodes of this polycentric region has played an essential role in catalysing and sustaining this economic performance. In general, when considering capacity, journey times, and reliability, these German towns and cities are significantly better connected than their UK counterparts.



Potential design solutions





Identifying solutions

Having established the serious challenges presented by the new baseline and the corresponding economic consequences and opportunities, our planning and engineering teams turned to investigating potential solutions. We focused this review on improving connections between the principal destinations of Manchester (city centre and airport), Liverpool, Birmingham and London. We have included Crewe in these solutions, given its importance as a rail interchange, role in the regional economy, and regeneration potential.

We thought about how **non-infrastructure interventions** could improve the use of existing infrastructure capacity – such as managing demand through dynamic pricing, or accelerating the deployment of connected/autonomous vehicles (CAVs). Our view is that, although these approaches could certainly play an important role and should be advanced by the transport industry, there are two key limitations. Firstly, the impact is likely to be negligible in the medium-term. Secondly, technological progress and practical deliverability are deeply uncertain. Both of the example measures mentioned above have been discussed for years, but face huge implementation hurdles.

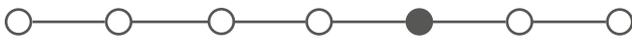
We also considered **road-based options**. The major concern with road expansion, of course, is the impact these solutions could have on our net-zero ambitions, alongside the well-evidenced phenomenon of ‘induced demand’, which simply leads to further congestion. Many major road expansion projects across the UK are currently stalled on environmental grounds. Although road travel is becoming

less carbon-intensive with the growing adoption of electric vehicles and more fuel-efficient conventional vehicles, the carbon impact of travelling by car remains on average ten times as high as travelling by train.²⁵

Whether we sought to expand the existing M6 motorway or build new roads, any project would be substantially disruptive and potentially impractical. We considered at a high-level the option of making use of the HS2 corridor for a new road running broadly parallel to the existing M6. A key consideration is that the cross-section of the HS2 corridor varies considerably along its length. At its narrowest, it is roughly 13 to 16m. At most, this could accommodate a single two-lane carriageway, which requires a total of 14.4m. A dual two-lane carriageway requires 26.1m (figures are excluding embankments).

It is also important to note this would be for straight sections of the network; widening is often required for visibility purposes depending on horizontal curvature. Other areas that would particularly need careful consideration to determine how a new road could make use of the HS2 corridor include tunnelled and viaduct sections. There are also specific locations that present greater planning and engineering complexity, for example at Mere Viaduct and the M56 junction 6.

A road-based approach would also do nothing to address the significant rail operational challenges north of Birmingham, set out in the previous section. On balance, our view is that new or expanded roadways are not an attractive approach to solving the connectivity gap between the West Midlands and Greater Manchester.



SECTION 3

We therefore focused on a **range of rail-based solutions**, applying three broad approaches: upgrading the existing infrastructure (**Concept A**), a combination of upgrades and some new sections of track (**Concept B**), and an entirely new line (**Concept C**). Within each of these, there are, of course, numerous options in terms of the specific interventions, the ways in which they could be phased or structured, and the service patterns and rolling stock strategy that could be adopted. We have focused this review on identifying the right concept-level approach.

In view of the challenges that the HS2 programme has faced with cost escalation, and with the aim of foregrounding 'affordability' in our analysis, we have developed these concepts with a sharp focus on minimising cost. One aspect of this has been to bear down directly on capital cost through design changes, as detailed below.

Beyond this, acknowledging that risk management between public and private sectors has been a key source of cost escalation, in both designing and evaluating the options we have also sought to maximise and understand their suitability for alternative models of infrastructure delivery that provide a better opportunity to manage these risks. We further explore these new models of infrastructure delivery in Section 4.

Concept B and **Concept C** make use of the same route as the former HS2 Phase 2 albeit to different extents.^{*} However, as noted above, we have significantly rethought the design to reduce capital cost. The most impactful changes are the adoption of:



A lower design speed – 300kph rather than 360/400kph (still meeting the definition of 'high-speed' and significantly faster than the current WCML, which has maximum speeds of 120-175kph for non-tilting trains such as those procured for HS2).



A smaller cross-section – built to British rather than European specifications (requiring smaller works to avoid obstacles and simpler compatibility with the existing and future national network).



Ballasted track rather than slab track – we estimate slab track has a capital cost around 70% higher than ballasted track.^{**}



Simplified interfaces with existing Network Rail infrastructure, particularly around Crewe.

* Using the route planned for HS2 Phase 2 would enable delivery up to three years faster than otherwise, and make best use of the effort already expended and the impacts already felt which would otherwise be wasted. Our view is that this is still the best route, as it is based on in-depth reviews over many years and offers the best balance across cost, benefit, environmental, deliverability, local impact, and other factors.

** The decision to use slab track for HS2 was based on an analysis of whole-life costs, taking into consideration the long-term maintenance regime required to support the intended frequency, size and speed of HS2 trains. The trade-offs between upfront capital costs and whole-life costs would similarly need to be analysed in detail for this scheme, as part of finalising the delivery and funding model for the project.



Alongside these changes to the design specification, we have also considered enhanced use of repetition in design and modern methods of construction to further drive costs down.

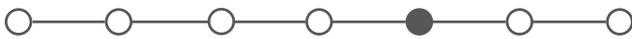
These choices collectively mean less land take, fewer and smaller earthworks, less imported material, fewer and simpler structures, reduced power equipment, less noise mitigation, and simpler tunnel portals, among other factors that reduce cost.

The cumulative impact of these changes may also mean that some of the ‘undertakings and assurances’ agreed under the previous planning consents may no longer be necessary, which could further lower costs. (Any such changes have not been analysed

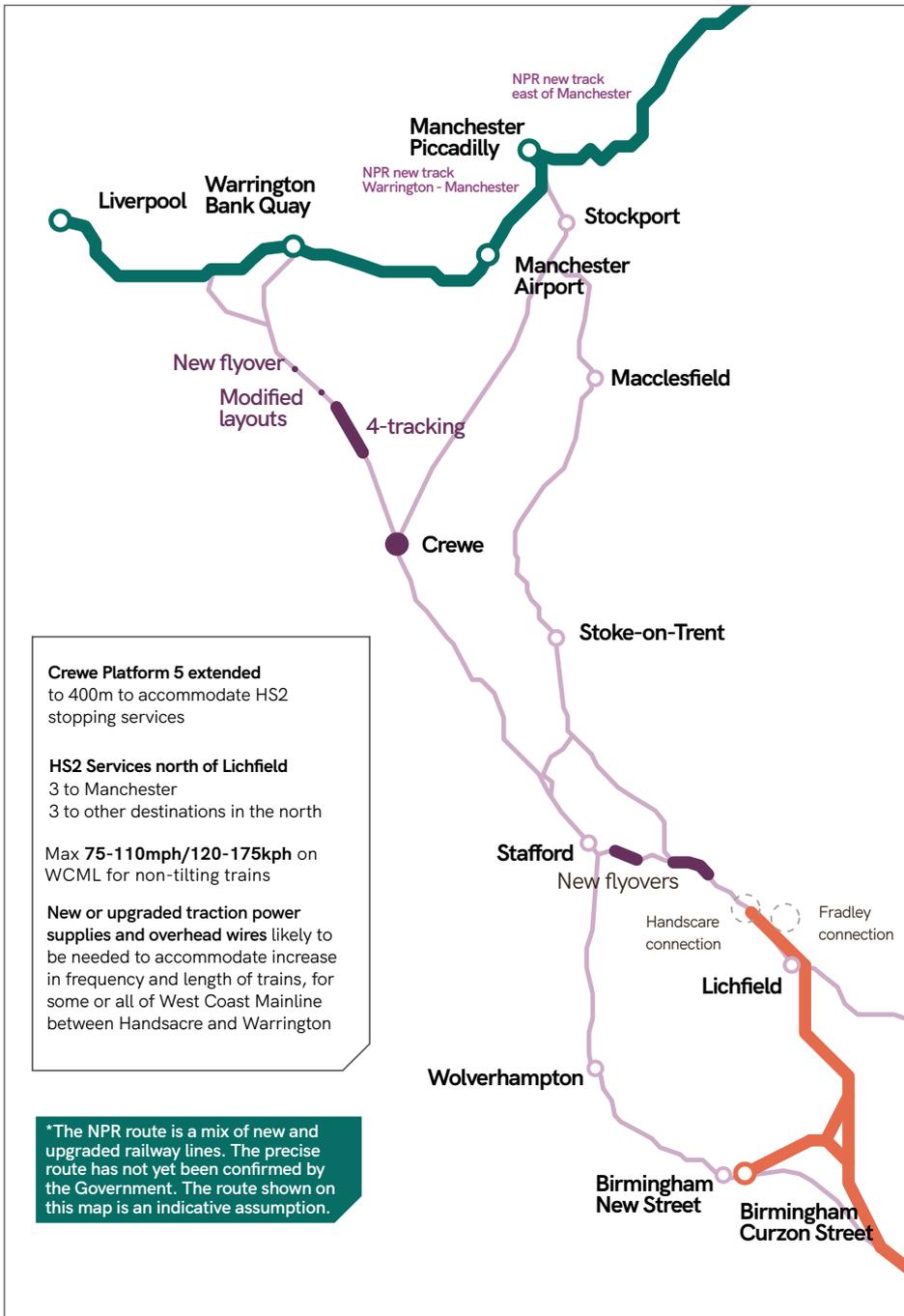
in this early-stage review, and nor has the process of amending these undertakings and assurances been assessed in detail.)

It should be noted that we have focused primarily on different infrastructure solutions for solving the connectivity challenge. There are, however, a number of corresponding operational decisions that can then be made in terms of the specific services using this infrastructure – the routes, frequencies, and stopping patterns – as well as how the mix of existing and future rolling stock could be deployed to optimise capacity and journey times. Several industry experts, such as Chris Gibb, have been putting forward creative, credible ideas in recent months, which should be considered in tandem with our proposals.





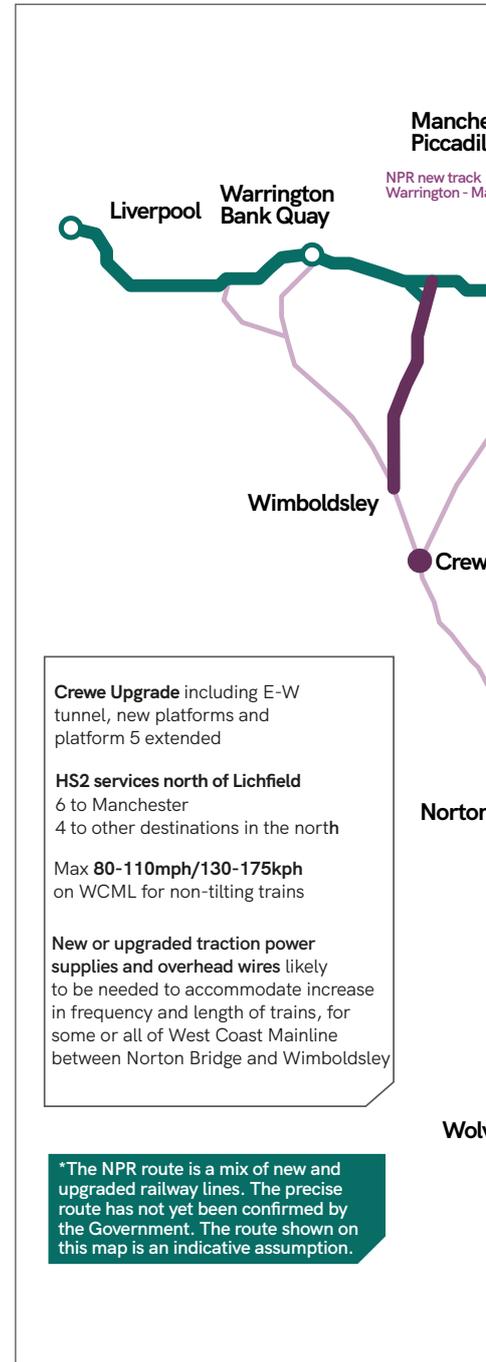
SECTION 3



Concept A

UPGRADE EXISTING INFRASTRUCTURE

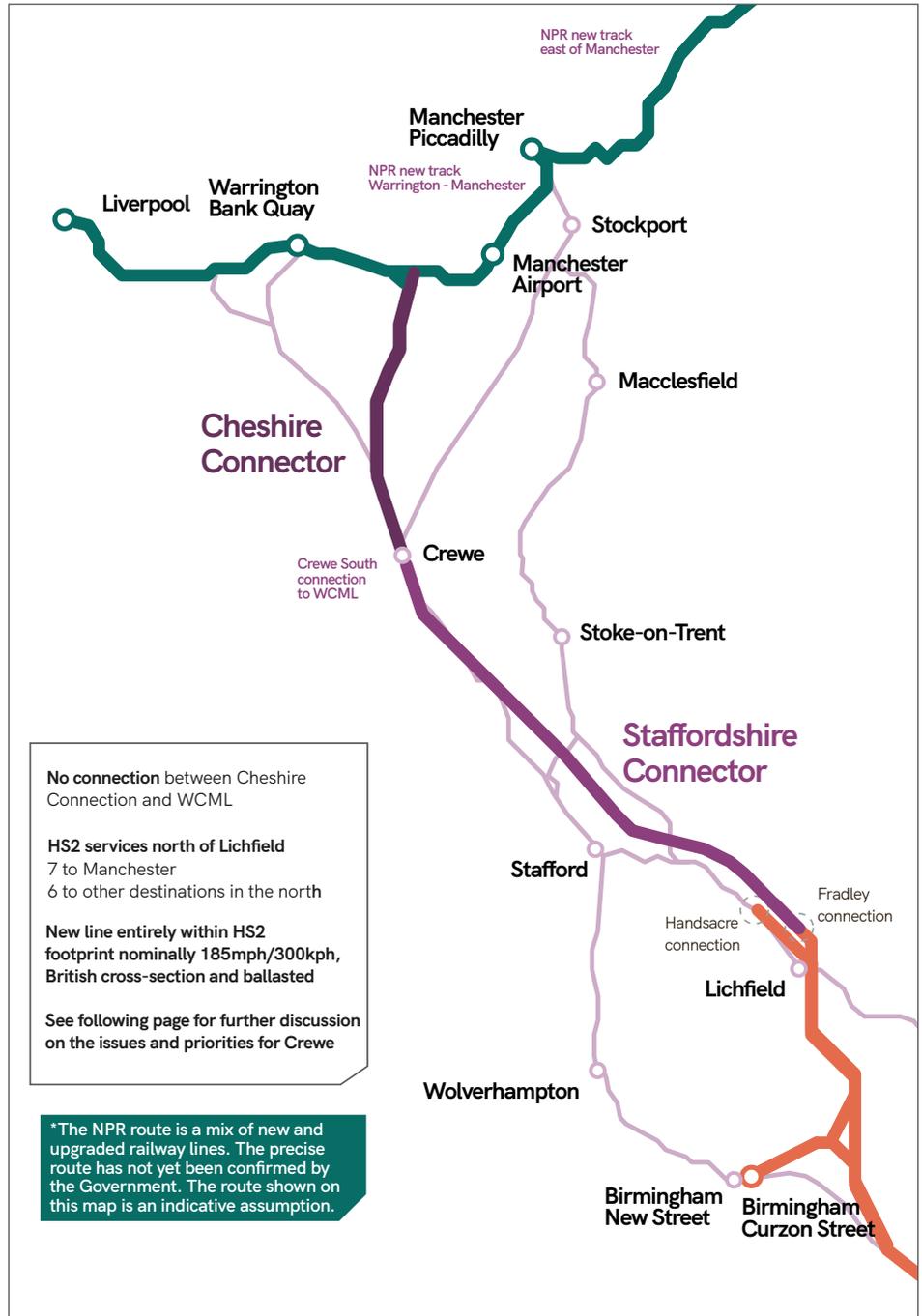
Package of major projects on the existing rail network to address key bottlenecks.



Concept B

A MIX OF UPGRADES AND BYPASS

New bypass segments to avoid the most congested and challenging-to-upgrade sections of the West Coast Main Line.



Concept C

AN ENTIRELY NEW RAILWAY

Maximise capacity on the corridor through a new railway, utilising a different design specification than HS2.

- Northern Powerhouse Rail (NPR)
- West Coast Main Line
- HS2 Phase 1
- New proposed infrastructure

ISSUES

most congested
as of the West

ASSESSMENT SUMMARY

We examined the three concepts against a comprehensive set of criteria, making use of both quantitative and qualitative data and analysis. The key conclusions of our assessment are shown below.

- Positive
- Neutral
- Negative

	CONCEPT A Upgrade existing infrastructure	CONCEPT B A mix of upgrades and bypasses	CONCEPT C An entirely new railway
Benefits	<ul style="list-style-type: none"> Delivers marginal additional capacity and service improvements. Limited opportunity for additional local services or freight paths. Would not unlock full NPR/HS2 Phase 1 benefits or catalyse significant levels of economic growth. <p>Potential benefits of c.10-20% of previous HS2 scheme.*</p>	<ul style="list-style-type: none"> Significant improvements to capacity and journey times between principal destinations compared to Concept A. To realise similar benefits to Concept C, the WCML would be heavily utilised with lower network reliability and potential disbenefit to non-HS2 services. No released capacity north of Stafford. <p>Potential benefits of c.60-70% of previous HS2 scheme.*</p>	<ul style="list-style-type: none"> Greatest impact on overall network capacity and performance as well as services between principal destinations. Maximal catalyst for regional economic growth and realising the full potential benefits from the two projects it connects (NPR and HS2 Phase 1). Releases significant capacity for freight services on the WCML, as well as for additional localised passenger services, benefitting communities not served by the new line. <p>Potential benefits of c.75-85% of previous HS2 scheme.*</p>
Deliverability	<ul style="list-style-type: none"> Complexity of working on existing, heavily-utilised line forces a trade-off between significant disruption (major, sustained and deeply consequential impacts to passenger and freight operations) or a very prolonged implementation programme (several decades). These trade-offs are likely to be unacceptable at a time when the economy urgently needs connectivity improvements, not deterioration. 	<ul style="list-style-type: none"> The upgrade needed at Crewe (including an east-west tunnel) and the connections to the WCML are likely to be very disruptive to deliver, requiring a 12-week blockade of the WCML. Delivery would be highly complex with associated programme and cost risks. Requires new planning consents and land acquisition powers. 	<ul style="list-style-type: none"> More deliverable than Concepts A and B with use of planned HS2 Phase 2A route, including significant land already acquired and planning consents in place. Potential options for consenting the northern segment (former Phase 2B) as part of NPR programme, and safeguarding of this land is currently in place. Proposed north-south tunnel at Crewe less disruptive to WCML services.
Capital Cost	<ul style="list-style-type: none"> c. 20-30% of capital costs than previous HS2 scheme.** However, this is likely to have significant operational costs, due to the long-term disruption required to deliver these upgrades. These have not been quantified at this stage but are likely to be substantial. 	<ul style="list-style-type: none"> c. 50-70% of capital costs of previous HS2 scheme.** As with Concept A, potential for additional unquantified operational costs due to disruption caused to current passenger services on the WCML. 	<ul style="list-style-type: none"> c. 60-75% of capital costs of previous HS2 scheme.** More expensive than Concepts A or B, but significantly cheaper than HS2 Phase 2 through strategically optimised specification, described on previous pages.
Commercial Appeal	<ul style="list-style-type: none"> Would not be viable or attractive to private investors due to the lack of a revenue stream and risks of on-network works; there are no comparable precedents for this model elsewhere. 	<ul style="list-style-type: none"> Less suitable for private investment compared to Concept C, given the delivery and access risk of the additional interfaces with Network Rail infrastructure; however, appropriate mitigations could be put in place to make this option more attractive to investment. 	<ul style="list-style-type: none"> Offers conditions to attract private investment through a fully segregated end-to-end railway, de-risked through existing land and planning consents for the initial phase of the route, and uses a delivery model that brings in wider efficiencies and innovation.

FIGURE 7: Options assessment: key conclusions



SUMMARY CONCLUSIONS

● CONCEPT A

Upgrade existing infrastructure

This approach would be unlikely to represent value for money given the high capital and operational costs relative to the small local and wider economic benefits. This approach is likely to be undeliverable in practice, given the required blockades and severe impact on existing services that would be experienced over a long time. Funding for this option could only realistically be in the form of Government capital grants to Network Rail.

● CONCEPT B

A mix of upgrades and bypasses

Lower benefits compared to Concept C and potentially lower capital costs; however costs may ultimately be quite similar given the complex interfaces with multiple parts of the existing rail network. Issues related to operational reliability remain, and there are significant challenges with deliverability.

● CONCEPT C

An entirely new railway

Offers the highest net benefits, with a step-change in capacity, travel time improvements, and network performance. This would cost less than the previous HS2 scheme and would be attractive to private investors as an 'end-to-end' greenfield scheme that minimises complex interfaces with existing network assets.

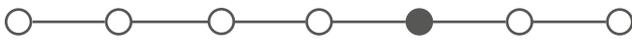
Concept C will deliver most of the transformational benefits in capacity and connectivity that the original HS2 line would have delivered (equivalent seat numbers and train frequencies), at a substantially lower cost and only marginally slower journeys (approximately 15 minutes longer on the London to Manchester route, which is still 30 minutes faster than today's services).

This is preferred over Concept B due to the relatively minimal difference in costs between the two, compared to Concept C's greater benefits and much stronger suitability for attracting private finance.

Concept C would also save the taxpayer £2bn on costs from the HS2 Phase 2 cancellation by re-using much of the land, powers, and design work already secured through public investment. Concept B would be able to make only minimal use of these 'sunk' costs.

* Based on pro-rating journey time savings from HS2 Phase 2a and 2b business case, not new economic modelling. Excludes crowding benefits.

** Comparison based on last published HS2 Phase 2 Statements of Expense, adjusted to common base date and optimism bias. The NPR and Golborne Link segments of the HS2 Phase 2 costs have been omitted to enable a more direct comparison for this segment from Handsacre to High Legh. Includes costs for addressing challenges at Crewe, but does not include net additional costs to NPR or London Euston that may be required to accommodate additional north-south services.



Recommended path forward

Our review has concluded that the best path forward is Concept C: a new rail line, approximately 80km in length connecting Lichfield to High Legh (and thereby linking HS2 with NPR) to create the **Midlands-North West Rail Link** (MNWRL).*

The MNWRL consists of two major segments – a Staffordshire Connector that runs south of Crewe, and a Cheshire Connector north of Crewe. This new line would connect with the end of the current HS2 network at Fradley and provide a direct link into the proposed NPR alignment at High Legh, thereby connecting directly into Manchester and beyond.

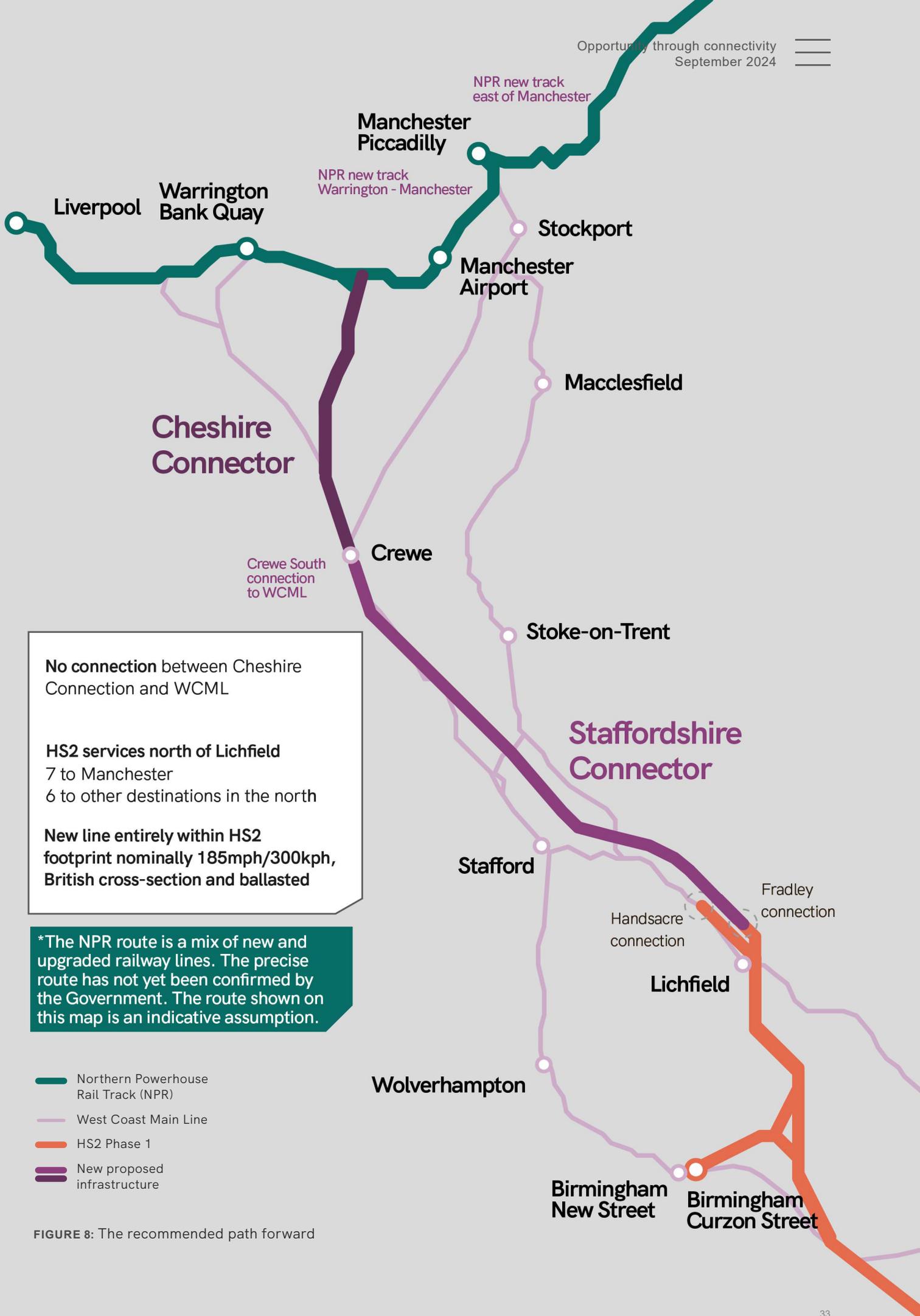
These two segments should be delivered in a staged manner, allowing for the progressive release of benefits (further discussion on this point follows later in this section). It would also make full use of more efficient delivery mechanisms through repetition of design and modern methods of construction.

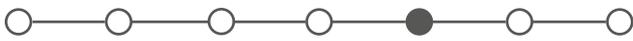
The Staffordshire Connector would make use of land and powers already secured for HS2 Phase 2A, while the Cheshire Connector would require land north of Crewe to be secured through either the NPR Bill(s) or a bespoke consent for this segment only.

These two connectors will need to 'join' in Crewe. Today, Crewe is a complex web of tracks, platforms, freight yards and sidings, with a mix of passenger and freight trains moving in multiple different directions at uneven times.

Any solution to increase north-south capacity through Crewe will be expensive and disruptive, and requires more detailed development work with Network Rail and local stakeholders to resolve the deep-seated challenges in this part of the railway. Our approach leaves open several options, including a dedicated a north-south bypass for through-trains.

* As noted in the baseline assessment, the analysis undertaken for this review makes an assumption that HS2 Phase 1 is delivered in full, including connecting to London Euston Station, and ensuring Euston is appropriately sized to accommodate additional services running north of Birmingham. We also assume Northern Powerhouse Rail is delivered as per the previous Government's commitments, with Manchester Piccadilly also able to accommodate additional north-south services.





Opportunities for freight

The West Coast Main Line is a key artery for freight in the UK and is critical to the supply chains of businesses up and down the country.

The Midlands 'Golden Triangle' is the UK's pre-eminent logistics hub, receiving and distributing goods and materials across the country. Because of the WCML's strategic position in relation to the Triangle – connecting it to large urban centres, the main deep-sea container ports in the south of England, and other major ports in Wales, the North-West, and Scotland – this section of the railway is a critical lynchpin of the UK's freight strategy.

Over 40% of the UK's rail freight uses the WCML at some point on its journey, making it the busiest rail freight corridor in the UK, and one of the busiest in Europe. There are currently up to 78 freight trains per day in both directions on the busiest section between Stafford and Crewe. Hams Hall, just east of Birmingham, is the UK's busiest rail freight interchange.

Much of the freight on the WCML uses the large marshalling yard at Basford Hall near Crewe, where trains are marshalled or stabled for onward journeys, or simply pass through to avoid lines running through the congested Crewe station.

As discussed earlier in this report, the cancellation of HS2 Phase 2 created a significant capacity problem for the WCML north of Lichfield, resulting in the future inability to provide for increased freight services that will be required to support sustainable economic growth across the North, Wales, and Scotland.

The creation of a new rail link between Birmingham and Manchester will address this major constraint, and by moving some passenger services to the new line, it will open up additional freight paths on the WCML. This will greatly contribute to the Government's target of 75% rail freight growth by 2050, a key pillar in reducing carbon emissions from transport.

An example of the far-reaching freight benefits delivered by the Midlands-North West Rail Link would be to improve access to strategic rail freights sites at Intermodal Logistics Park (ILP) North and Port Salford. This could help support wider ambitions to optimise freight terminal locations across the North West, alongside accommodating future freight growth. Paired with other interventions, this could also support the removal of some freight services from the rail network in central Manchester where they impact on passenger trains.

The Transport for the North Freight Strategy (2022) states that, 'the whole network in central Manchester is severely congested which causes extremely high levels of delays to train services, giving Manchester 20% of the locations with the worst train delays in Britain.'

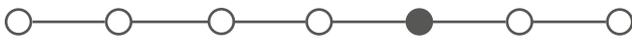
Through the provision of additional paths and junctions on the WCML to either or both of ILP North and Port Salford, the centre of Manchester could be bypassed by freight trains, which would improve the performance of the rail network through the city and across the North of England, benefitting passengers through more reliable services.

Opportunity through connectivity
September 2024

- West Coast Main Line
- UK Motorway Network
- UK Railway Network
- UK Freight Traffic Flows
- Intermodal Rail Freight Terminal
- UK Golden Logistics Triangle



FIGURE 9: UK Rail Freight Network Traffic Flows



Incremental delivery of a modern rail network for the North and the Midlands

The **Midlands-North West Rail Link** can be aligned with the wider programme of rail projects to form an integrated programme of delivery for the next two to three decades. There is an opportunity to sequence these programmes, starting with HS2 Birmingham to London and the Midlands Rail Hub being delivered now; our proposed Staffordshire Connector and upgrades to existing NPR lines entering into delivery stages in the next few years; and then the NPR 'new lines' and our proposed Cheshire Connector coming on-line in parallel to 'complete' the network.

This approach will provide benefits by realising some outputs early, delivering surety of pipeline to the construction industry (which in turn will reduce costs), staggering cash outlay, and giving appropriately-sized tranches for private sector investment (see next section).

This approach draws inspiration from the model used on other major rail programmes. For example, the Thameslink Programme of the 2000s and 2010s staggered costs over many years by being separated into a series of infrastructure improvements that each led to key outputs. This allowed progress to be made on platform widening, links between existing lines, new station boxes, and, later, major upgrades at existing stations.

Each time another increment of infrastructure was delivered, a step-up in service was unlocked across the whole network, with the cumulative impact at completion being much greater than the increments. Similar approaches were taken on the WCML upgrade of the early 2000s, Manchester Metrolink expansion, and development of the London Overground network.

Taking account of the current status of plans for the wider rail network, existing consents and planning/design work, and committed investments, our recommendation is that the **Midlands-North West Rail Link** should be a single project, committed to in full, but delivered in two stages:

Stage 1. The segment between Lichfield and Crewe (the 'Staffordshire Connector') should be delivered now, utilising the powers contained in the High-Speed Rail Act 2021 (which granted the necessary consents for the prior HS2 Phase 2a). Delivering an early increase in passenger capacity, as well as reducing journey times, this new link would also provide more options for freight south of Crewe and improve reliability in the Stafford area. It would ensure the work completed, land acquired, and trains procured to-date can be used, avoiding loss of value from that investment.

We do not recommend the Staffordshire Connector as an end-state in itself, as the northern section is required to fully unlock transformational capacity and journey time benefits. But as a first step to delivering the MNWRL, this stage would send a powerful message of confidence to the Midlands and North West and the rail industry. It would revive local investment plans, for instance at Crewe. Proceeding quickly with the Staffordshire Connector would also enable more effective delivery of both this line and Northern Powerhouse Rail, as the skills and supply chain from HS2 Phase 1 could be leveraged more readily.

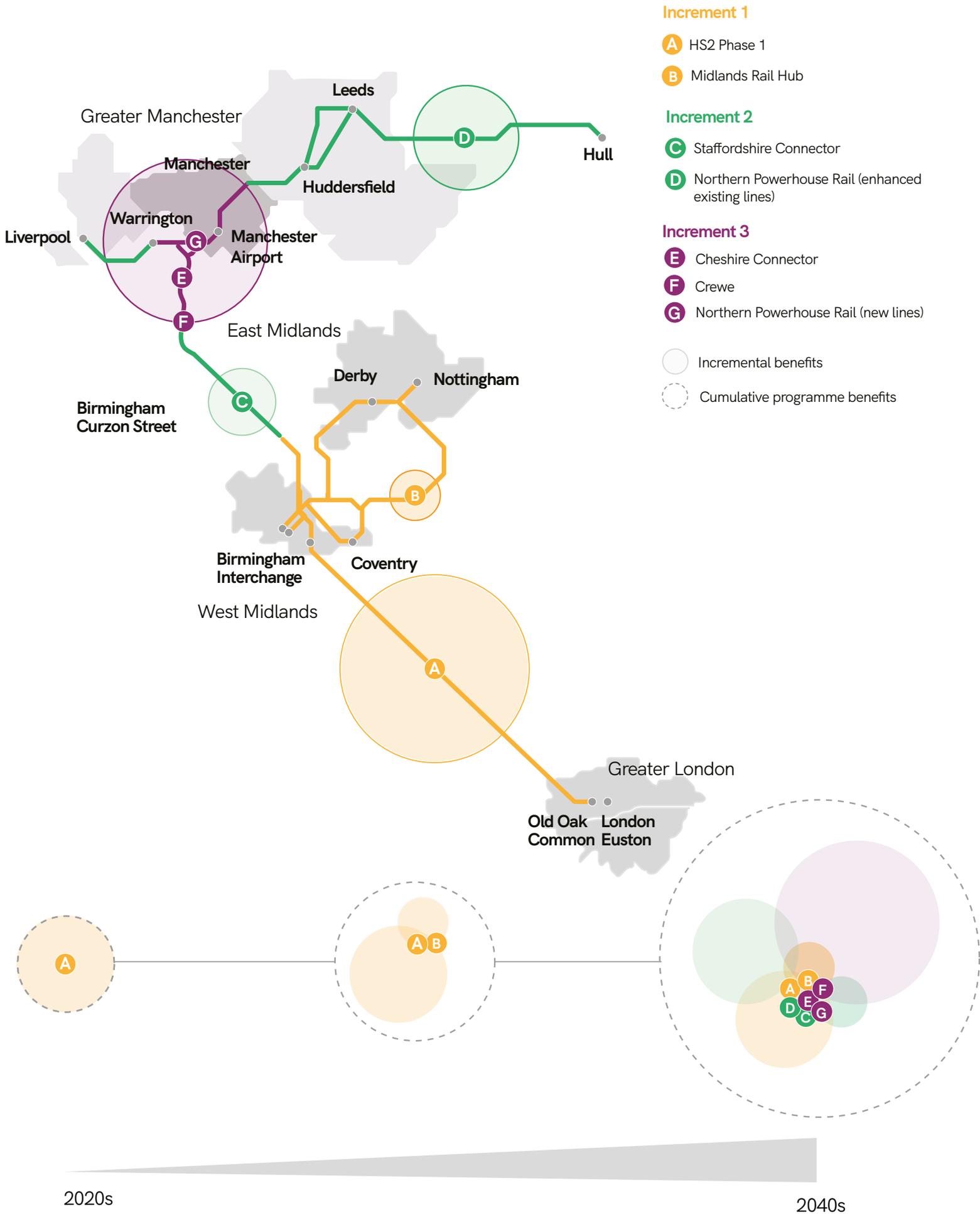
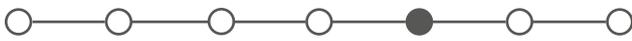


FIGURE 10: Conceptual incremental delivery approach



SECTION 3

Stage 2. Design and planning for the ‘Cheshire Connector’ – the northern segment of our proposed scheme – should be progressed now so that it can inform key design specifications for the NPR project (see below) and open at the same time. The most efficient and expeditious approach would be for a combined NPR and Cheshire Connector solution to be designed, consented, and delivered as an integrated package.

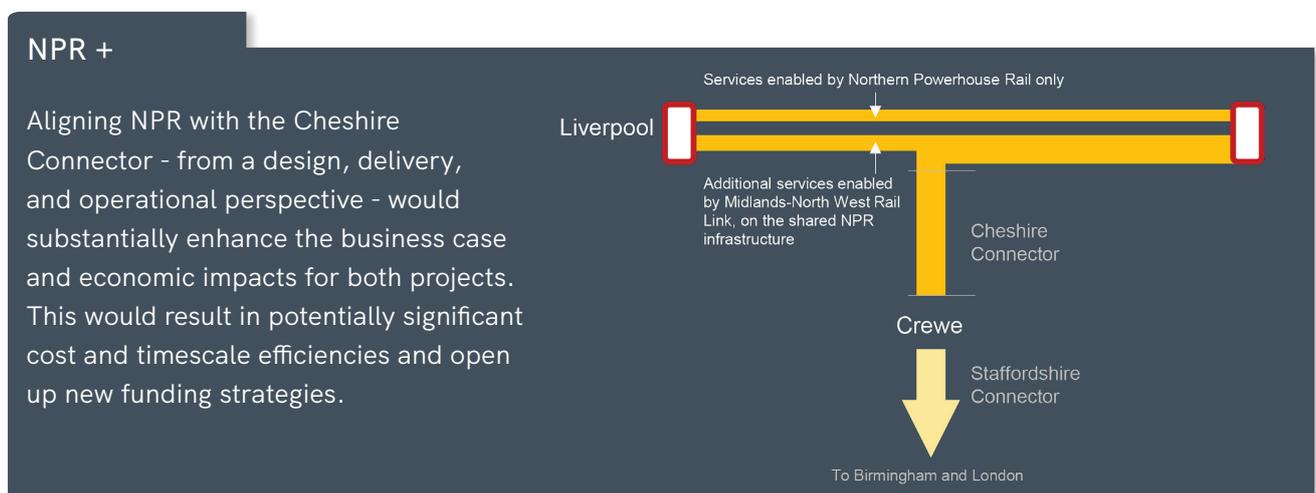
Sequencing the Staffordshire Connector and the Cheshire Connector in this way will allow both sections to capitalise on the benefits of the other major rail enhancement programmes, and vice versa. In this way, the sum of the benefits as a whole, across all programmes, will be greater than its parts.

It is important to note the full potential of this integrated programme of improvements depends on designing the relevant sections of NPR to accommodate north-south services (i.e. trains coming from London and Birmingham

into Manchester Piccadilly using the new NPR lines), alongside the east-west trains from Liverpool and Leeds. The previous Government’s announcements on NPR would not have allowed for this.

However, the infrastructure required to integrate north-south and east-west services in future (such as increasing the number of platforms to accommodate more frequent trains, and lengthening them to accommodate 400m trains) would be substantially more expensive and disruptive to build once NPR moves beyond the design stage. Closing off this opportunity now could risk fixing a sub-optimal solution for generations.

We recommend as a critical priority that the new Government work with the Metro Mayors and other industry stakeholders on an integrated consenting, phasing and delivery plan for rail enhancements across the Midlands and North, building on the staged concept set out in this report.







An alternative model for funding and delivery



We need a new approach to delivering major infrastructure in the UK

The final question we sought to address concerns the appropriate delivery and funding model for the Midlands-North West Rail Link. Our starting point is that a new approach is needed, as it is evident that a ‘business as usual’ approach is not going to get this project off the ground.

The key challenge that needs to be addressed is the high cost of delivering infrastructure, and particularly transport. According to a recent review by BCG...

‘...the UK performs poorly in terms of unit costs when it comes to rail and road: the UK’s absolute unit costs are higher than all other peer countries in our dataset.’²⁶

We have already looked at how we can reduce the cost of this new rail line by reconsidering the scope and design solutions. However, there are wider project and industry-level challenges that also need to be reviewed and addressed (see table below).

While the HS2 project has to some extent typified all of these challenges, many are systemic in nature, and collectively they have contributed to a delivery environment that is no longer meeting the nation’s needs. Our economy is hamstrung by a backlog of unmet infrastructure requirements stretching back decades. The Resolution Foundation estimates we need to spend £40bn per year over two decades simply to deal with this backlog.

This analysis leads us to the conclusion that not only is an alternative approach needed for the MNWRL, but that such a model could also serve as a means to unlock the UK’s chronic infrastructure investment gap.

PROJECT-LEVEL CHALLENGES	WIDER SECTOR CHALLENGES
<ul style="list-style-type: none"> • Sponsors often set highly prescriptive design and output specifications (rather than an approach that is based on delivering specified outcomes) that curtail scope for innovation and efficiency, and limit the ability to mitigate downstream risks as they materialise. • Scheme creation typically takes place with the private sector at arms-length, resulting in a solution optimised towards non-commercial outcomes or objectives, which fails to adequately take account of the practicalities of operations and maintenance. • Extensive design variations from project sponsors – the inevitable product of the above issues – further push up the cost of delivery. • Extensive and bespoke commitments are often made to local stakeholders during the planning consents process, driving up capital costs from original estimates and creating the need for complex and costly administrative structures. 	<ul style="list-style-type: none"> • Despite efforts to streamline and build more certainty into the infrastructure planning process, promoters face an environment that can be unpredictable and inefficient. Delays, duplication, and indecision push costs upwards and lead to abortive work. • The arms-length bodies that oversee delivery are very often bespoke organisations created (at significant cost) for individual projects, and without a plan to transition to subsequent projects, hard-won experience and institutional knowledge is not effectively carried forward to subsequent programmes. • A lack of stability in our public policy environment creates deep uncertainty that stymies investment. In the absence of a clear infrastructure strategy that ensures decisions taken today are not simply reversed a few years down the line, our ability to compete for international investment in infrastructure is undermined. • In turn, the absence of a clear long-term pipeline inhibits contractors and manufacturers, along with other crucial links in the supply chain, from investing with clarity and certainty. Inevitably, this drags on efficiency, labour stability, skills development, and institutional memories, which eventually manifest as higher project costs.

Harnessing private sector expertise, innovation, and capital to drive efficiency

Above all, we believe the model for the MNWRL must be founded upon greater engagement of private sector expertise and innovation in scheme design and delivery, helping to drive efficiency and lower capital costs. Doing so would also make it easier to effectively optimise the scheme to attract private capital, which can mitigate up-front Government outlays.

Many nations, including the UK and others across Europe and Asia, have relied on significant private capital to deliver major infrastructure projects. We have reviewed 26 precedent projects (the vast majority from the rail sector) to learn from the successes and - importantly - the failures. This analysis informs the conclusions and recommendations throughout this report.



FIGURE 11: International precedents for private investment in infrastructure



The benefits of an enhanced role for the private sector in these projects comes down to four key factors:



AFFORDABILITY

Reduces pressure on finite Government capital budgets and overall debt, enabling greater quantities of infrastructure to be delivered in less time.



COST CONTROL

With overrun risk appropriately transferred, the contractor is better incentivised to drive down cost during design and construction. Costly variations and stop-starts can also be avoided.



TIMELINE

Rail projects with more private sector involvement are typically delivered faster. This not only brings forward benefits but also revenue, and it mitigates cost inflation impacts.

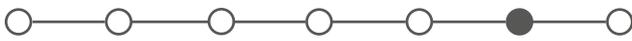


RISK MANAGEMENT

Carefully structured contracts struck early in design development allow downstream risks to be identified and controlled, incentivising good behaviours around delivery to quality, time and budget.

Despite these benefits, the use of these models has a mixed history in the UK, and has broadly fallen out of policy favour in most sectors as a result. These include concerns about long-term value for money, given that these deals are often more costly to the public sector over the long-run; and the difficulty in both sides understanding, forecasting, and pricing risk effectively, which could lead to either the public sector getting a 'bad deal', or the private sector partner taking on too much risk and ultimately collapsing.

However, there have been important successes (such as the M25 DBFO) alongside the challenges and failures, and we have learned from both to develop a model fit for the changing opportunities and challenges now confronting us. Both the Welsh and Scottish Governments have recognised the need to embrace PPPs again through their use of the Mutual Investment Model. We should be considering similar approaches again in England.



Attracting private finance to the Midlands-North West Rail Link

Our review of global precedents has enabled us to understand some of the key ingredients for successful partnership with the private sector on major rail projects. Although there are no schemes that offer an exact parallel to the MNWRL, these insights have supported our efforts to design a preferred concept that is well-suited and attractive for private investment. Characteristics of the MNWRL that make it well-suited and attractive for investment include:

- **It makes use of greenfield land and would operate as a clearly segregated asset.** This enables a clear 'definition' of the project, and minimises and simplifies interfaces with other networks. This has proven to be a crucial ingredient for successful privately-financed schemes²⁷
- **It occupies a corridor with demonstrated strong levels of travel demand** over sustained time period, connecting major urban centres, which reduces revenue risk and provides confidence over long-term investment repayment.
- **It would be a relatively straightforward project to deliver.** The distance is only c.80km and the engineering is well-understood; our design solution further de-risks and simplifies the engineering compared to the previous scheme. Serious complexities remain at Crewe however, and the interaction between this scheme and those improvements would need further detailed evaluation with Network Rail.
- **The project is split into two proposed tranches.** The Staffordshire Connector first, then the Cheshire Connector – which should reduce debt requirements. The two connectors can be phased sequentially, and the Staffordshire Connector can stand alone in the interim period before the Cheshire Connector comes online, with fully viable operations and demonstrable economic benefits.
- **The Government has already substantially de-risked** delivery of the Staffordshire Connector, having acquired significant portions of the required land and secured planning consents via the HS2 Phase 2A Act, mitigating a key source of uncertainty.* As noted in the following sections, we are proposing a blended funding approach where Government will continue to be a funding partner in the project.

Several of these characteristics are similar to the Tours-Bordeaux high-speed rail project in France, which provides a successful precedent for significant private investment in major new rail schemes (see below). Provided there is political will to create an investable structure, underpinned by clear requirements and balanced risk allocation, we believe there is a clear role on this project for private finance.

* The Phase 2A Act also imports some cost risk and complexity through various commitments made to stakeholders through the planning process. Review of these commitments and the extent to which they could be adjusted in light of the new proposed design is beyond the scope of this initial review, but should be undertaken as this process moves forward.



There are broadly two models for private investment in infrastructure:

1. Availability and/or performance payments
2. Track access charges; investment recovery charge; passenger fees etc.

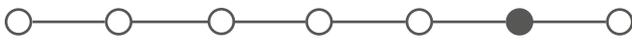
Either of these models could be considered for the MNWRL. The fundamental difference is which party (Government or the private sector) retains farebox revenue risk.

We are not recommending a specific model for the MNWRL at this stage. Determining the optimal approach will require more detailed analysis of the project’s financials, and iterative choices across several variables

including capital and whole life costs; public sector funding constraints and priorities; allocation of demand, construction, and interface risk between parties; and project packaging. This will all need to be further assessed as this scheme progresses, including through market soundings with global investors.

However, we are confident that a well-optimised project would attract sizeable investment. There is **investor appetite for well-structured projects** in the rail sector, as our case study review has shown, including several projects which have secured investment in the £3-5bn range.

CATEGORY	WHO HOLDS REVENUE RISK?	DESCRIPTION	EXAMPLES	COMMENTARY
Availability and/or performance payments	Government.	Private investors finance the design and construction of the line (and potentially operations/maintenance). They are paid back over time through regular payments from the public sector based on availability and performance of the infrastructure.	HSL Zuid, Sydney Metro North West, Ontario Line Subway, UK PFI projects.	Although not currently in policy, availability payments would allow a greater amount of private finance to be raised, and this model is broadly preferred by the market. This is effectively moving a short-term capital expenditure pressure to a long-term revenue expenditure commitment. In the long-run, this approach could be more expensive for Government, but it would allow for earlier delivery of critical infrastructure.
Track access charges; investment recovery charge; passenger fees; etc.	Investors (but likely with some form of usage guarantees from Government, which may transfer this risk in-whole or in-part).	As above, but investors are paid back over time by train operators and/or passengers, who pay for use of the privately-financed infrastructure (e.g., through a charge-per-train path, or a surcharge on the ticket fare).	HS1, Tours-Bordeaux TGV.	This approach passes the initial burden to those that receive the most benefit from the project, i.e. the users. The key risk is the level of demand (patronage) that will be realised over time and therefore the scale of the revenue stream. Revenue could also be captured from station operations as part of this approach, for instance through retail leases.



A blended funding strategy that reflects project benefits

HS2 was to be entirely funded through central Government grants. However, we do not think this approach is plausible for the MNWRL, given the constraints on HM Treasury. The exact proportion of private finance would need to be determined based on the factors set out above, but 100% private sector financing is uncommon for major rail schemes, due to the typical scale of underlying revenue streams and project risk profiles.

This means that, as in the Tours-Bordeaux project, a blended approach will be required to fund and finance the MNWRL.

In recognition of the diverse array of economic benefits these schemes generate, it is now common practice around the world to bring together a broader range of public funders with private funding sources to support delivery of major transport projects.

PRIVATE SOURCES

In the previous section we have set out why we believe the MNWRL would be attractive to private investors, and how this might be structured. This has been further reinforced through preliminary conversations our consortium has held with the investment community.

We acknowledge the approach we are outlining here would require a review, and potential reconsideration, of existing Government accounting rules pertaining to public-private partnerships (PPPs). Under current rules, most PPPs would likely be considered to be 'on-balance sheet' as public sector borrowing (and 'scored' as capital expenditure), due to the revenue risk carried in whole or in part by the Government.

Given the changing political and fiscal climate in the UK, and the successful application of PPP models for rail projects elsewhere, we believe now is the right time to reopen a dialogue with HM Treasury about the appropriate accounting treatment for partnerships with private investors.

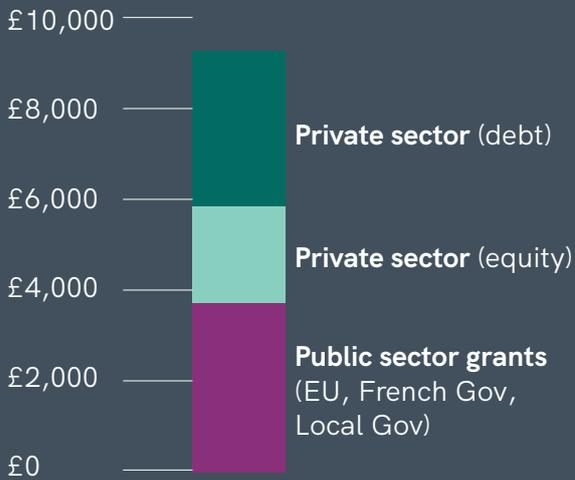
CASE STUDY

Tours-Bordeaux TGV (France) funding model

The Tours-Bordeaux HSR line runs between Paris and Bordeaux alongside an existing conventional railway. The line was constructed by the LISEA consortium (VINCI, CDC Infrastructure, SOJAS, and AXA Private Equity) who is contracted to own, maintain and operate the line over a 50-year concession period.

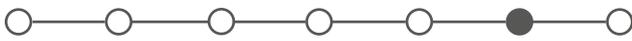
This project is owned by LISEA which financed c. 49% of the project's total value through equity contributions from shareholders and raising debt from the European Investment Bank (EIB) and commercial banks. The remaining amount was raised through significant contributions from the French Government, EIB and Réseau Ferré de France (later SNCF), local communities and the EU. Significant portions of the private debt are also guaranteed by the French Government.

LISEA bears all risk associated with the infrastructure during the concession period, including financing, construction, maintenance and revenue risk. Critically, the passing of revenue risk to the LISEA entity is supported by a set schedule of SNCF-operated trains (French state operator) over the tracks, providing a perceived reduction in revenue risk associated with this line.



Simplified funding model breakdown





LOCAL SOURCES

Our review has identified the potential for significant economic benefit to be generated along this corridor. These will flow to local landowners, businesses, and the wider community.

There are various ways in which local funding could be raised to support the project, linked directly to this uplift in economic activity including:

Business rates: A portion of the net-increase in business rates that is directly attributable to the project (i.e. which would not have been 'generated' if the project was not delivered) could be ringfenced over time, and used to repay upfront financing to support the capital works.

These types of mechanisms were used successfully for the Northern Line extension to Battersea and London's Crossrail.²⁸ As Greater Manchester and the West Midlands already retain 100% of their local-raised business rates for ten years under the 'Trailblazer Deals' agreed in 2023, this approach would require careful analysis on the genuine 'uplift' created by this scheme, so as not to impact important local services and investments being funded through the existing deals.

Property development: Another potential local funding source could come from property development along the corridor, in particular in station areas and on publicly-owned land. Potential contributions could also be sought from planning contributions and section 106 obligations.

Property development is a major funding source for international rail projects, particularly in Asia and parts of Europe, and development in London (at Old Oak Common and Euston) is contributing to the costs of HS2 Phase 1. The challenge here is that it does not include the major station areas in central Birmingham or Manchester (that are delivered by HS2 Phase 1 and NPR respectively) where the most development value is likely to accrue. Still, this opportunity should be explored in detail along the full length of the route to ensure some portion of the property benefits are captured by the scheme.

Local contributions to the project would likely require new revenue raising powers to be devolved to local and/or Combined Authorities, and we understand the new Government is supportive of these conversations as part of its devolution agenda.

* We acknowledge that some of these same sources may also be under consideration for other major rail and urban transport projects. A comprehensive funding strategy should be developed that reflects the holistic needs of the city-regions and secures investment in public transport.



We recognise the significant pressures on local budgets. Alongside other core services, both the West Midlands and Greater Manchester have transformational urban transport plans, focused on both near-term improvements and long-term growth, with significant investment in metros, buses, active travel, and other critical infrastructure. Combined Authorities are already contributing heavily to these projects, a trend which is set to continue: the NIC recommends that ‘the cities that directly benefit from the major [urban] transport projects... should make a significant contribution to the capital costs...of at least 15 to 25%.’²⁹

While local contributions should form some proportion of the MNWRL package, this must be balanced against the equally vital investments in urban connectivity, as they are critical to ensuring the benefits from intercity connectivity can be fully realised.

CENTRAL GOVERNMENT SOURCES

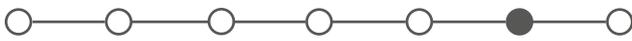
Financial commitment from central Government will be needed to deliver this project. This support could take several forms, including cash (grant), usage guarantees, land, and/or enabling works.

It is important to recognise this is not a ‘zero sum game’. Investing in nationally-significant infrastructure boosts UK productivity overall, which results in net additional tax receipts flowing back to HM Treasury.

In our economic assessment above we identified that the West Midlands and Greater Manchester economies could be £40-70bn larger if they were performing at the UK average or in line with peer cities in Europe. The UK’s ‘tax-to-GDP’ ratio is roughly 35%, which would suggest that c.£14-24bn in additional tax receipts could be generated annually if this growth was achieved, releasing funding for a whole host of vital public services.

Even if only a portion of this is directly attributable to enhanced connectivity, this still equates to sizable sums flowing back to the Exchequer on an annual basis. This is alongside the important national public policy objectives that the scheme would help deliver, for instance as a key enabler for building more homes and driving innovation.

We believe that an openness to blended funding strategies that more effectively capture the nuance of benefit distribution is an important route to unlocking the UK’s infrastructure pipeline.



Proposed delivery structure

CO-SPONSORSHIP BETWEEN CENTRAL GOVERNMENT AND METRO MAYORS

The Midlands-North West Rail Link could demonstrate a new way for central Government and the Combined Authorities to come together to co-sponsor and deliver regional-scale (and nationally-important) infrastructure projects. This co-sponsorship approach would better recognise the impact the project will have on the economic growth and place-shaping ambitions of the city-regions, ensuring the places that most directly realise the benefits contribute to the scheme and have a reasonable opportunity to shape the project's direction.

A comparable co-sponsorship model was fundamental to the delivery of the Elizabeth Line in London and should be extended to other Metro Mayors. While this approach introduces complexity given the need to align multiple parties, this can be managed through a shared vision and objectives, effective governance and committed leadership.

Network Rail, HS2 Ltd and local authorities on the route also need to play a key delivery role in this scheme. They should be engaged early in the process and on an ongoing basis so that economic opportunities can be identified and captured into the scheme in the early stages. This will be particularly critical for managing the design and delivery interfaces with existing (Network Rail) and future (HS2 and NPR) rail infrastructure, as well as progressing a unified operations strategy. The details of these arrangements and relationships will need to be worked through in the next stage of this initiative.

DELIVERY BY A PRIVATE SECTOR-LED SPECIAL PURPOSE VEHICLE (SPV)

Outlined below is a potential commercial structure that could be used in the delivery of this project. This is notional at this early stage; further work is required to confirm the best solution and structure, including through more detailed financial modelling.

Under this structure, a privately-led MNWRL SPV would be responsible for the delivery of the infrastructure, under a concession agreement with Government. The concession agreement should be suitably structured and incentivised to balance control and governance from the public sector, while allowing the private sector to deliver the services unimpeded.

The SPV will require a mixture of debt and equity for the duration of the project, and should receive commensurate funding through, for example, track access charges or availability payments (as defined by the allocation of revenue risk; see above). Project packages outside of the SPV (e.g. enabling works) could be procured by the public sector in support of the project.

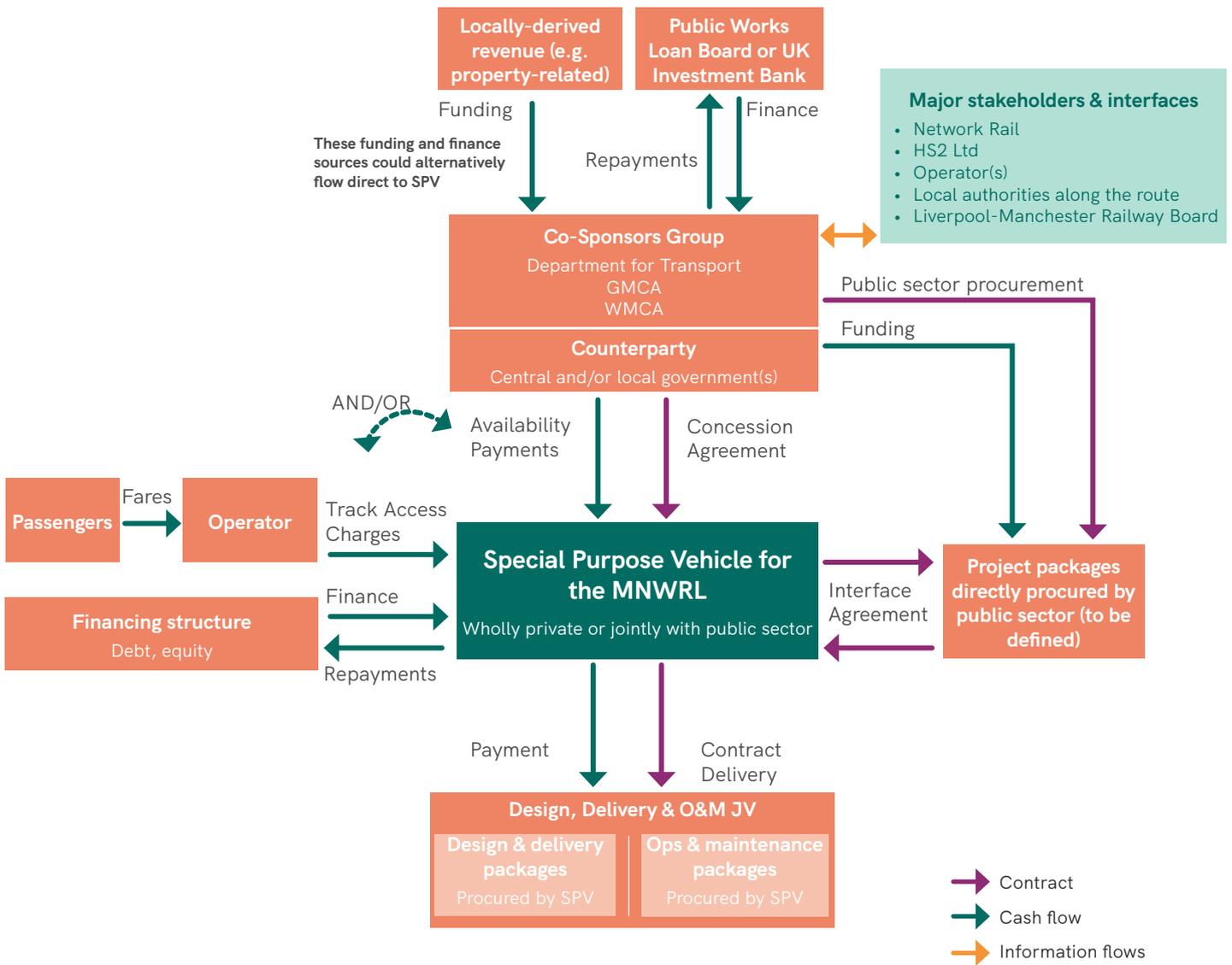
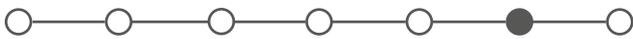


FIGURE 12: Potential contractual structure for scheme delivery



CASE STUDY

Tours-Bordeaux (France) - delivery model

One potential delivery structure shares many similarities with the model employed for the Tours-Bordeaux HSR project, which serves as an exemplary case study of how public sector funding can facilitate private sector involvement through a public-private partnership model. The project aimed to connect two major population centres, Paris and Bordeaux, which were previously linked by a slower rail line. The pre-existing demand significantly reduced the demand risk for the HSR, making it an attractive proposition for private investors.

The contract for designing, financing, and constructing the line was awarded to LISEA, a consortium of VINCI, CDC Infrastructure, Ardian, and Meridiam. LISEA subcontracted the design and build of civil works and systems to the COSEA consortium and the operation and maintenance services to the MESEA consortium. Under this arrangement, LISEA managed the network operations through its contact with MESEA, while SNCF handled passenger fares, with LISEA receiving track access fees.

The financing of the project was a mix of equity contributions, bank debt, and public finance grants. LISEA shareholders contributed approximately \$860mn in equity, with RFF contributing \$1.3bn. LISEA was responsible for raising the following debt facilities

- c. \$1.2bn of bank debt guaranteed by the French Government
- c. \$680mn of non-guaranteed bank debt
- c. \$841mn of debt provided by Fonds d'Épargne

- c. \$450mn of EIB credit guaranteed by the French government
- c. \$225mn of non-guaranteed EIB credit

While LISEA bore overall project responsibility, the public sector played a crucial role by providing significant financial support, including grants and debt guarantees to allow the private sector to secure their own financing instruments. The complexity of the contractual arrangement was effectively managed through the consortium structure, involving VINCI, CDC Infrastructure, Ardian, and Meridiam. This consortium approach created a seamless interface among partners and ensured the provision of equity from consortium members, amounting to approximately \$860mn.

The Tours-Bordeaux HSR project illustrates how a well-structured contractual framework, underpinned by appropriate public sector funding and regulatory measures, can attract and leverage private financing for large infrastructure projects. While in this case the public sector contribution was substantial, similar outcomes can be achieved with a reduced public sector role, provided that appropriate guarantees are in place.

This case study may be applied to the proposed Midlands-North West Rail Link to demonstrate how the private sector can be incentivised to deliver key infrastructure items under significant risk transfer contractual arrangements, where appropriate support is provided by the public sector (e.g. guarantees for private debt).



In summary, we believe:

- In recognition of the UK's infrastructure cost and delivery challenges, as well as constrained fiscal environment, a different delivery and funding model will be needed for this project, leaning on domestic and international precedents.
- The project can provide an opportunity to bring together the best of both public and private sectors working in partnership. This will, however, require a renewed openness on the part of the Government (and in particular HM Treasury) to private investment in transport infrastructure.
- We have designed our preferred concept, the MNWRL, to be attractive to private investment: it is a greenfield, segregated line that minimises interfaces with other rail infrastructure, on a corridor that has already demonstrated significant travel demand, and uses a de-risked engineering solution. All of these are demonstrated characteristics of success in other major rail schemes where the private sector has invested its capital.
- Under this approach, financing for the project should be maximised from the private sector, with central and local governments partnering to fund the balance. The revenue streams supporting the private investment could be in the form of either availability/performance payments from Government or a track access charge-type model.
- An agile delivery structure should be established, with the project delivered by a lean and privately-led special purpose vehicle, overseen by a public sector co-sponsors group bringing together central Government and the Metro Mayors.
- This is a pragmatic solution built on a foundation of what has worked in major rail projects across the globe. In particular, the proposal leverages the successes and learns from the challenges of the precedent approach taken by the Tours-Bordeaux Line. Although the public sector contribution was significant in this case, similar results can be achieved with reduced public sector input if appropriate guarantees are provided.



Where do we go from here?



A deliverable path forward for the Midlands-North West Rail Link

This review has focused on analysing a key connectivity gap between the West Midlands and Greater Manchester and identifying an affordable, deliverable railway solution for addressing this challenge – a vital ingredient for catalysing growth across these city-regions and beyond. We have sought to take a place-based approach to this process, grounded in the needs and ambitions of the people living and working locally.

Our proposed **MNWRL**:

- Will be approximately 60-75% of the capital cost of the former HS2 Phase 2 scheme,* while still maintaining a substantial proportion of the economic and transport benefits for passengers and rail freight – achieved by reconsidering the design, engineering specification and delivery model;
- Will amplify the benefits of current and committed investments in other major connectivity programmes, for instance by maximising utilisation of the new Curzon Street station in Birmingham;
- Takes full advantage of the substantial public investment that has already been made in constructing Phase 1, procuring rolling stock, acquiring land, and securing planning consents on a portion of the former Phase 2 route; and
- Introduces a delivery model for bringing together the private sector, central Government, and local governments to fund and deliver nationally-significant infrastructure.

While further technical work and economic appraisal is necessary to fully develop this concept solution, this assessment provides the foundation of a credible and robust case. There are opportunities to strengthen the case even further, including:

- Assessing the degree to which capacity and resilience could be further enhanced through optimising the speeds and mix of the available rolling stock on different parts of the network.
- Exploring a possible interlinked funding and finance strategy with NPR – including the potential for private and local investment as part of a joined-up package, recognising the intertwined nature of the projects (spatially, operationally, and economically).
- Analysing the potential for the delivery of significant housing, new employment or innovation districts along the corridor, which could play a crucial role in both strengthening the strategic and economic case for the scheme, as well as unlocking potential alternative funding sources.
- Reviewing the corresponding ‘eastern connectivity gap’ identified by our review and the NIC (Midlands to Leeds), to consider options that follow similar principles to this study.
- Reviewing the planning framework for major infrastructure projects and bringing this in line with the approach taken in peer countries. We understand this is already a stated objective of the new Government, and we welcome this review.

* Refer to footnotes on cost in the ‘Potential design solutions’ section.



Our request of the new Government, and our offer

Our review has highlighted that without urgent action, existing connectivity between the North West and Birmingham will soon reach capacity. This will impact both economic growth and quality of life for people living in these regions, as well as those in Leeds, the North East, London, and elsewhere who rely on this corridor to make connections across the nation.

We believe urgent action to address this challenge is both necessary and achievable. Key strategic decisions will need to be made by early 2025 to take advantage of current planning and land acquisition powers. This will ensure a viable solution is delivered before the quality of connectivity worsens as travel demand grows, creating a major barrier to economic growth and the delivery of housing in this region.

This private sector coalition has come together, with the support of the two Metro Mayors, to form a proposal for a **Midlands-North West Rail Link**. To move this forward, we are asking the Government to undertake the following actions:

1. Establish a Steering Group between the private sector, Combined Authorities and Central Government to drive forward development of an 'at pace' feasibility study and technical analysis over the next six months focused on:
 - Working with the newly-established British Infrastructure Council to convene global private sector investors to attract investment into this critical link, and use this as an opportunity to reposition the UK as a country that is open to institutional investment in infrastructure;
 - Undertaking further financial, commercial, and economic analysis to develop an investment prospectus for the private sector, and optimise value for money across all rail investments for the public sector;
 - Working closely with Network Rail, HS2 Limited and other bodies to advance the technical specification further; and
 - Developing an appropriate governance structure that could be used to take the project forward.
2. Critically we need time to get this right, and support from the Government to work with us on the activities above, building on the work we have done to date. The government could help the private sector advance technical and commercial solutions by:
 - maintaining ownership of the current landholdings on the former Phase 2A route from Handsacre to Crewe while this work is underway; and
 - reinstating safeguarding for the land not-yet-acquired on this route; protecting and prolonging existing planning powers; and maintaining flexibility to reincorporate the Crewe to High Legh segment into the repurposed NPR Hybrid Bill while a new solution is finalised and agreed.
3. Formally consider the network-wide benefits of this proposition alongside proposals for enhancing east-west connectivity in the North and the economic benefits this would bring to the whole of the UK.



Taking the time now to get these strategic decisions right would come at minimal cost but potentially enormous long-term benefit to the nation. Our future connectivity – and by extension, the economic and social health of our society for generations to come – depends on us making the right choices today.

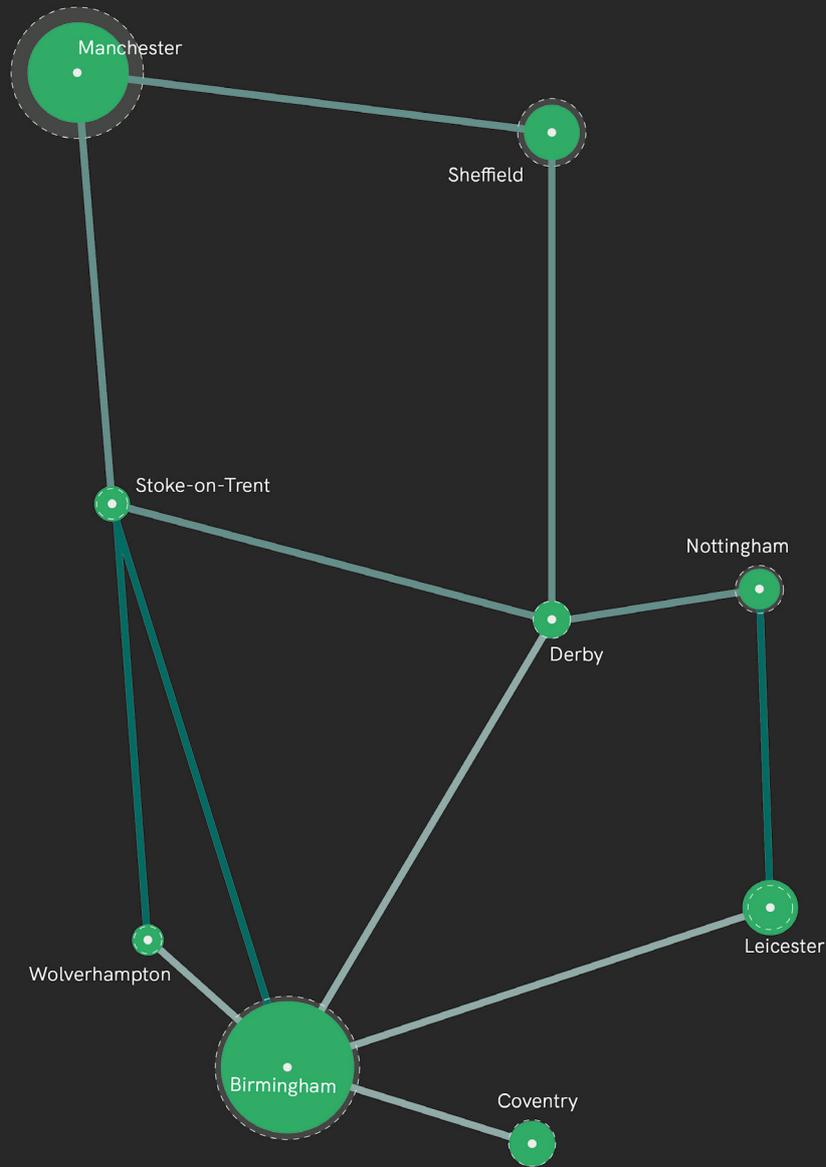
‘The window...is closing. Ducking the big decisions over the next 12 months will put the major goals of net zero, regional economic growth, and... environmental protection in jeopardy.’

– Sir John Armitt, Chair of National Infrastructure Commission

The MNWRL will help achieve several of the new Government's objectives

PRIORITY	HOW OUR PROPOSAL SUPPORTS THIS PRIORITY
Kickstart economic growth	This Government is focused on delivery and driving the sense of urgency that is needed to implement projects that will catalyse growth for regions throughout the UK. The MNWRL is a solution to better connecting the regions of the North of England that have been overlooked due to underinvestment in transport and impacted by the inconsistent decision-making, which was so clearly illustrated by the cancellation of HS2 Phase 2.
New homes	The Government has set out its ambition to build 1.5mn homes, creating the new housing the UK desperately needs to address the shortage of homes for communities in all corners of the UK. The new link will support these ambitions for the benefit of the people of Greater Manchester, the Midlands and the cities and towns beyond.
Devolution	The enhanced connectivity between Birmingham and Manchester, and the important connectivity this MNWRL will bring to northern towns and cities such as Sheffield and Leeds, provides a clear example of Combined Authorities taking an even more active leadership role in shaping and delivering the infrastructure investments they need for their regions and the rest of the UK.
Improving performance on railways and driving rail reform	This priority seeks to improve the UK's railway performance, a key objective of MNWRL in releasing capacity on the existing network and supporting future passenger demand by addressing bottlenecks and constraints. The West Coast Main Line is creaking and has very poor performance across many metrics important to both passengers and freight. This new link provides a solution to address these performance challenges.
Improving bus services across the country	Releasing capacity on the rail network will help reduce crowding and improve the passenger experience on buses, and support higher future bus travel demand.
Transforming infrastructure to work for the whole country, promoting social mobility and tackling regional inequality	Enhanced inter-regional connectivity will unlock access to jobs, education, leisure and housing opportunity across under-served or poorly connected communities.
Delivering greener transport	Better inter-city rail connectivity will encourage a modal shift from passenger vehicles to trains and support a higher rail freight mode share, reducing congestion and vehicle air pollution across the UK's road network, and supporting the Government's transport decarbonisation goals.
Better integrating transport networks	The incremental delivery of MNWRL will connect major current and future UK transport investments together through NPR, providing a better integrated and enhanced national transport network for passengers and freight.

The region's economic performance and connectivity quality today...



Quality of Connectivity

Low

Medium

High

Daily Commuters

- 30,000+
- 20,000-30,000
- 10,000-20,000
- 1,000-10,000
- 0-1000

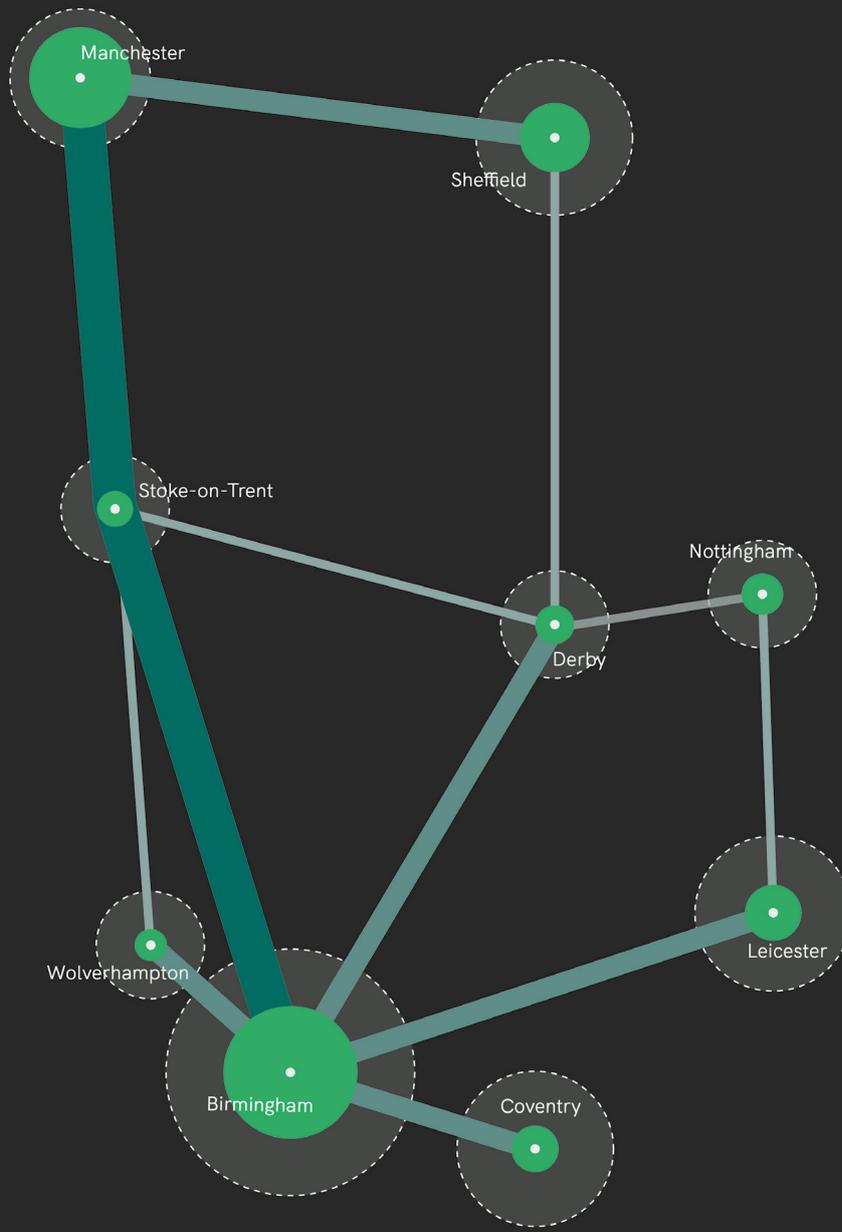
GDP/Capita
(circles scaled proportionally)

Population
(circles scaled proportionally)

Both diagrams are at the same scale



...and in a potential future where the region is on par with the Rhine-Ruhr, Germany

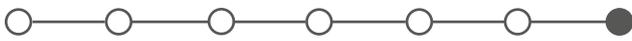


Enhancing connectivity between UK towns and cities in the North and Midlands – as set out in this report, and as the NIC recently recommended – is economically vital to the economic growth of this region and the nation.

These connectivity improvements of course need to be paired with consistent policymaking and investment in many other areas, such as skills and housing, over a sustained time period. But as Germany has seen in the Rhine-Ruhr, which shares many of the underlying demographic and geographic traits as this

part of the UK, such a commitment can lead to transformational economic and social outcomes.

If this region became as economically productive as the Rhine-Ruhr, it would mean c.£90-100bn in additional GDP to the UK economy – increasing the current UK GDP by approximately 3%. This growth could mean as many as 30,000 new jobs coming to the region, alongside a massive uplift in living standards.



Acknowledgements

We would like to express sincere gratitude to Mayors Andy Burnham, Andy Street and Richard Parker. Without the Mayors stepping up and demonstrating crucial leadership on this issue, this review would not have happened, and urgently-needed thinking, conversations, and solutions would be even further delayed. Their shared visions for prosperity and placemaking across Greater Manchester and the West Midlands have been the central tenets guiding this work.

We thank Sir David Higgins for chairing this effort, and Arup's collaborators from Addleshaw Goddard, Arcadis, Dragados, EY, Mace, and Skanska for their invaluable input in shaping the technical and strategic components of this review. The key contributors from each organisation include:

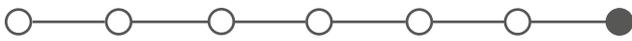
- **Arup:** Paul Addison, Tom Bridges, Sarah Clark, John Collins, Richard de Cani, Matthew Dillon, Josie Drath, Jerome Frost, Stephanie Howell, Owen Jones, Tom King, Andrew Nothstine, Andrew Went, Michael Wilton
- **Addleshaw Goddard:** Paul Hirst, Francis Tyrrell
- **Arcadis:** Daniel Cochlin, Jonathan Sharrock, Helen Murphy

- **Dragados:** Juan Ares
- **EY:** Stephen Church, Megha Garia, Harry Kean, Kamal Patel
- **Mace:** Paul Leighton, Mark Reynolds
- **Skanska:** Martin Leppard, James Richardson

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Lastly, we would like to thank Alex Ford and Devika Parmar (from the Arup visual communications team) and Hornbeam & Co for their work in designing this report.





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